CANADA
DEPARTMENT OF MINES
HON. CHARLES STEWART, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

NATIONAL MUSEUM OF CANADA
W. H. COLLINS, ACTING DIRECTOR

BULLETIN No. 47

ANTHROPOLOGICAL SERIES, No. 9

Some Shell-heaps in Nova Scotia

BY

H. I. Smith and W. J. Wintemberg

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
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THE ARCHÆOLOGY OF MERIGOMISH HARBOUR, NOVA SCOTIA

BY

Harlan I. Smith

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THE ARCHÆOLOGY OF MERIGOMISH HARBOUR, NOVA SCOTIA

INTRODUCTION

Merigomish harbour, on Northumberland strait, Nova Scotia, extends from about 4½ miles southwest to 6 miles northeast of Merigomish, a post office and station on the Canadian National railway 12 miles east of New Glasgow. It is in the section of Canada known to anthropologists as the Eastern Woodlands. The country bordering the harbour is a rolling lowland characterized by rounded hills and knolls. Three or 4 miles southeast from the harbour, plateau-like uplands, locally called "mountains", begin abruptly, and to the east attain a height of 1,100 feet.

The bedrocks of the lowlands are chiefly soft shales, sandstones, and limestones. The highlands are underlain by slates and quartzites with which are associated volcanic and intrusive rocks. All these rocks and the glacial debris afforded material for the prehistoric people of the harbour. Large sandstone concretions, broken along their concentric surfaces, are found on the beach and may have furnished ready-made mortars and material suitable for grinding.

The larger streams start in the highlands, from 6 to 10 miles from the shore, flow through deep gorges cut into the gentle slopes of the plateau surface, and, even where flowing through the gravelly beds on the lowlands, are interrupted by rapids and falls which offer obstacles to canoe navigation. At low tide the harbour is largely mud flats and eel-grass shoals traversed by the narrow channels of the streams. The narrow entrance makes the rather extensive sheet of water enclosed in the harbour comparatively safe for canoe navigation. Clam and mussel beds are common, and a few oysters may be found. Crabs, lobsters, eels, and other fish are plentiful in the harbour, and wild geese, moose, and other game are still abundant on the mainland.

The country was formerly wooded, and wild fruits and nuts are abundant. The soil is rich, and the climate suitable for agricultural pursuits.

Several reasons combined to make Merigomish harbour a favourable site for archæological investigations. Its shell-heaps were the largest not yet ransacked on the shores of the Maritime Provinces; they were large enough, indeed, to promise a full insight into the typical culture of the coast-dwellers along this part of the Atlantic seaboard. The coast culture again might differ from the culture inland, for no museum had separated the remains from the two regions, and one rich site on the coast would decide the point. Finally, it was desirable to compare the culture of the Iroquois Indians of Ontario, one of whose villages, Roebuck, had been excavated by the Division of Anthropology two years before, with the culture of the Algonkian Indians of the Maritime Provinces; and this could be done most readily by excavating some of the coastal shell-heaps, such as those at Merigomish harbour.

There are few archæological remains in this vicinity except shell-heaps. A small, prehistoric cemetery was excavated by the late Rev. Dr. George Patterson about 1874, and the most noticeable part, a circular

space about 10 feet in diameter, was re-excavated by the writer in 1914; but only a single tooth and a fragment of the upper end of a left femur were found. No other ancient graves are known here or elsewhere in Nova Scotia, although there exists on Big island an Indian burial-place, said to have been consecrated by the Roman Catholic Church, which belongs to the period of French settlement.

The shell-heaps are presumably relics of Micmac Indians, since Micmacs formerly lived on the harbour, apparently at several places where shell-heaps are now found. Patterson (b, page 27)[1] states:

> "Their [the Micmacs] principal place of encampment was at the foot of Barney river, on the east side, where they had, when the English settlers arrived, some clearings on which they raised a little Indian corn and a few beans. Other places, such as Big island, some of the smaller islands in the harbour, and some of the points on the shore, were also sites of their encampments, as may still be seen by the quantities of shells of oysters and other shell-fish found on the land, and the stone hatchets and arrow heads still occasionally picked up. Their burying ground, when the English settled, and for how long previous we know not, was near the west end of Big island on the south side, a short distance east of Savage point. This they used till about" [1837].

The harbour and vicinity, when visited by the whites, was inhabited by Micmac Indians. This tribe belongs to the Algonkian linguistic stock which, when first historically known, occupied one of the largest areas in North America, including all of the Maritime Provinces and the New England States. Micmac Indians still live on Indian island, fish, and make baskets on and about the harbour, and even collect from the shell-heaps archæological objects which they sell to tourists.

The majority of the remains known to belong to the shell-heaps are certainly prehistoric, but nothing indicates that they are very old. No objects clearly belonging to the shell-heaps had been obtained from the whites—no iron or steel axes, tomahawks, spearheads or knives, brass kettles, metal pipes, or glass beads. On top of shell-heap A (Figure 1) some modern things, such as bottles, bones of pigs, nails, bits of chain, and cold chisels were found, but they were evidently left on the heap recently and had been ploughed under or deposited over the shell-heap when the rock was cleared for quarrying. A coin found on the beach in front of the little heap I may have been lost by the Indians who left the heap, and who may have inhabited the place until after white men came. However, this heap was so shallow that it is uncertain whether objects found in it were not left by modern Micmac Indians, who are known to have camped along the beach within the last two or three years. Some links of iron chain were found in the shallow heap P, but there was nothing to indicate their origin, although a long, barbed arrow point with the tang missing, chipped from mottled grey and pink chert, was also found among the shells. Families who have lived in the neighbourhood for several generations have no knowledge or traditions of anyone having inhabited the shell-heap sites, or of any burial in the prehistoric cemetery ; but, according to Patterson (d, Catalogue No. 218), articles showing occupancy after the arrival of Europeans were found on the Millar farm, which may mean in heap O. Piers (a, page 111) states that no palæolithic or very old objects made by man have yet been found anywhere in the province.

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[1] References of this kind here and on following pages are to Bibliography, page 5.

Specimens have been collected on the surfaces of these sites, especially by Patterson and by an Indian who sold them to tourists, as well as by casual visitors. Patterson's collection from this harbour, totalling about two hundred and fifty specimens,[1] is in the Museum of Dalhousie University, Halifax, but there are no specimens from Merigomish harbour in the Provincial Museum, Halifax. Previous to 1914 there were only two important collections from Nova Scotia. The larger, in the Provincial Museum, comprises a little over a thousand specimens, and consists chiefly of miscellaneous collections, made from 1831 to 1914, by the late Judge M. B. Des Brisay, of Bridgewater, Nova Scotia, by the late C. W. Fairbanks, and by the late Dr. W. Webster. The smaller collection is in Dalhousie University and is chiefly made up of a collection presented by Patterson, with a few specimens presented by the late Dr. Thomas McCulloch. All the collections except that made by Des Brisay have been described[2]. Patterson's visit (a, page 232) in 1874 to the prehistoric cemetery on Big island was the commencement of his archæological work, and he described his collection in his article on "The Stone Age in Nova Scotia" in 1889 (a). Most of the specimens in the Patterson collection are from shell-heap O on Kerr point[3].

In the Peabody Museum of Harvard University there are from Nova Scotia, mostly from the vicinity of Annapolis, about fifty points chipped from stone for knives or projectiles, about twenty-four fragments of pottery, a maul made of stone, nine beads made of shell, and a small pendant made of stone.

The collections mentioned above contain practically all the prehistoric Micmac remains found between 1830 and 1914. Modern Micmac material may be seen in the Peabody Museum, the American Museum of Natural History, New York, the Museum of the American Indian, New York, the Field Museum of Natural History, Chicago, and the National Museum of Canada, Ottawa.

The archæological work dealt with in this report was begun in 1913, when, from August 5 to 8, W. J. Wintemberg visited the three shell-heaps, D, I, and O, mentioned by Patterson. He discovered shell-heaps F, G, and M, making a total of six shell-heaps then known, besides the prehistoric cemetery. In 1914, between June 27 and August 24, the writer located twelve additional heaps, making a total of eighteen shell-heaps on the harbour. His assistants continued the work until September 8. The largest excavations were made in heaps A and E, and most of the specimens were found there. Perhaps the most complete and detailed data yet obtained regarding the archæology of any one place in Nova Scotia were acquired; and one of the three largest collections of Nova Scotian archæological specimens was secured. The collection is catalogued under Nos. VIII-B-449 to VIII-B-1250, and VIII-B-1273 to VIII-B-1275, in the National Museum of Canada. These eight hundred and five catalogue entries cover a larger number of specimens, since as many as twenty-six fragments of pottery, chipped points, and other similar specimens from one place alone are in-

[1] Cf. Patterson (a), p. 242.
[2] Cf. Piers (a), p. 110, (b), (c), and Patterson (c).
[3] Cf. Patterson (a), p. 241.

cluded under one number. Judging from the artifacts usually found in Nova Scotia, the collection is rather complete. A characterization of the culture of the prehistoric inhabitants, has, therefore, been attempted, especially for comparison with the results of other work in Nova Scotia and various parts of Canada. The finds are listed in the appendixes, and have been compared with those collected at the same places by Patterson.

ACKNOWLEDGMENTS

Some of the illustrations are of specimens in the Patterson collection, which the writer was permitted to photograph. The animal bones were identified by Lawrence M. Lambe, of the Geological Survey. Joseph Keele contributed technical information regarding the manufacture of pottery. Mr. James W. Sutherland, Mr. Donald McDonald, and Mr. Finlayson gave permission to explore on their land. Assistance and hospitality were accorded by Mr. Daniel Simpson, Mr. Peter A. Millar, the Copelands, the Oldings, and many other people of the vicinity.

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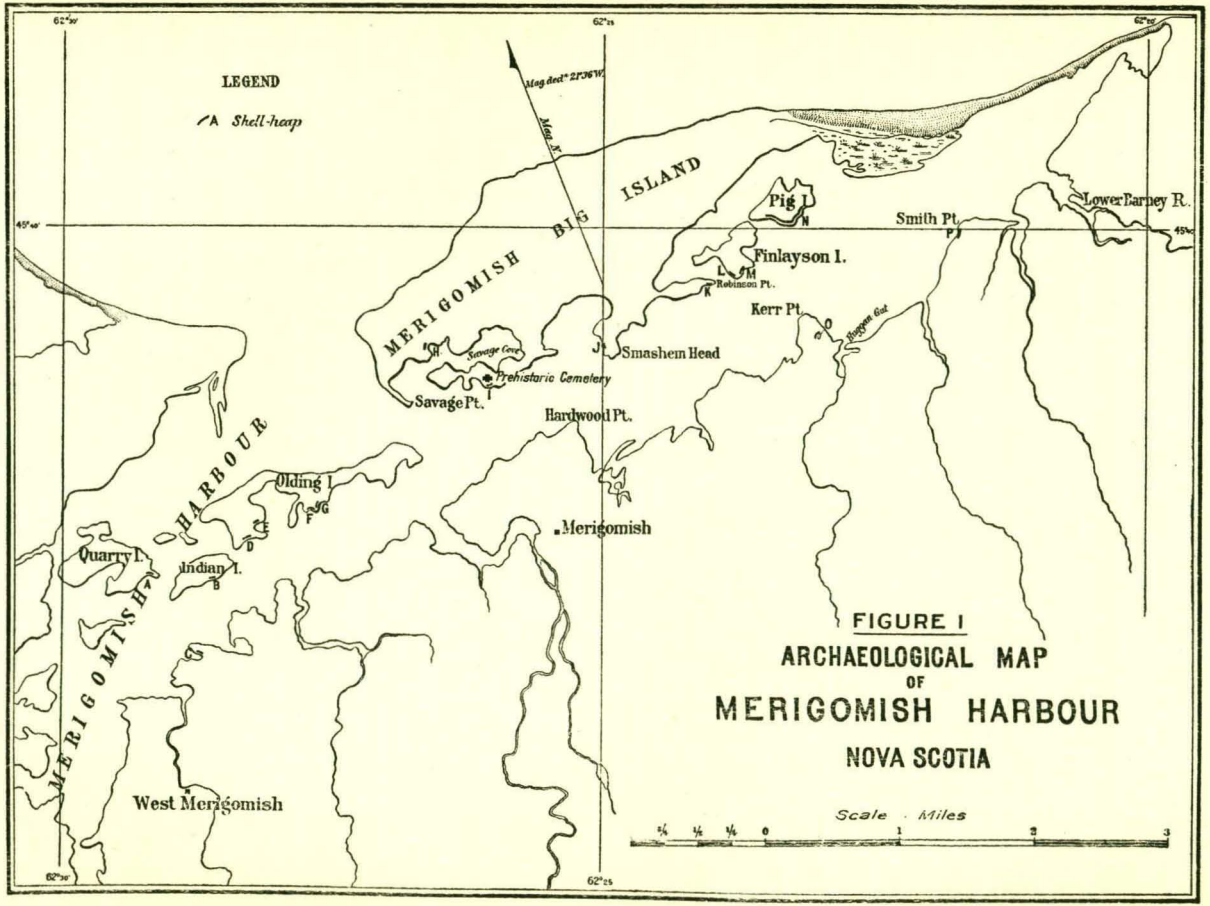

FIGURE 1

ARCHAEOLOGICAL MAP OF MERIGOMISH HARBOUR NOVA SCOTIA

ARCHÆOLOGICAL SITES, MERIGOMISH HARBOUR AND VICINITY

The known archæological sites on Merigomish harbour comprise eighteen shell-heaps, the prehistoric cemetery excavated by Patterson, a modern cemetery, and places that may possibly be, respectively, a modern wigwam site, a burial place or "battle field", an earthwork, and a workshop. Most of the shell-heaps are located in the most sheltered places, generally on southern shores. Many of them are on islands. The sites are above high tide, but usually in low places along the shores of small bays. A large proportion, although undercut by the waves, are sheltered from the wind by bluffs, and are near beds of shell-fish. Similarly, the Eisenhauer shell-heap, on Mahone bay, has a southern exposure and is protected from west and north winds by higher land. Most other sites seen by Mr. Wintemberg in the Maritime Provinces have either southern or eastern exposures. The sites on Merigomish harbour are described in order, beginning at the west.

Shell-heap A (Figure 1) is on the south side of the low part of the east end of Quarry island, at the north end of the quarry. At low tide one can walk around the island and wade to the mainland to the west. The land and quarry are owned by Mr. James W. Sutherland. The scarp of the heap was at least 80 feet long. Part of it is shown in Plate II A. Scattered shell-heap material extends to the trees shown in Plate II A on the opposite or north side of the island. There, east of Mr. Sutherland's house, is a very thin and scattered amount of shell-heap material, which shows slightly in a low, wave-cut cliff on the north shore. This is probably the northern part of the heap; slight traces between it and the main part to the south have been disturbed by many years of cultivation, and in 1915 were obscured by a crop of hay. The site is sheltered by a hill to the west.

The heap had been partly dug away by quarrymen, and part of what remained had been covered, in places, to a depth of 2 feet, with earth and rock from the quarry. This debris had to be removed with scrupulous care so that no modern cultural features became confused with the older remains. The remaining part of the heap was 2 feet in maximum depth.

This shell-heap was made up about equally of black dirt and sea-shells. Charcoal was occasionally found and, rarely, masses of bones of small fish. The shells are chiefly those of the quahog *(Venus mercenaria)*, the oyster *(Ostrea virginica)*, and the common mussel *(Mytilus edulis)*. Shells of the hen clam *(Spisula solidissima)*, the soft-shelled clam *(Mya arenaria)*, the horse mussel *(Modiola modiolus)*, the moon shell *(Lunatia heros)*, the boat shell *(Crepidula fornicata)*, a spiral shell, probably *Urosalpinx cinerea*, and another spiral shell, were less common.

A tabular statement of the finds in this heap is given in Appendix I.

Shell-heap B (Figure 1). A shell-heap on Indian island, an Indian reservation, shown in Plate I A, was disclosed at one place by particles of shell and refuse among the roots of a fallen tree. The heap extends

from the beach nearly to the Indian burial place, which is marked by a crucifix behind the church (Plate I A), and reaches higher above sea-level than any other heap on the harbour. At low tide, clam beds are exposed on the eastern end of the island, and one can walk on the wet sand and mud from the island to shell-heap D near the landing on Olding island.

The following objects, all probably from this heap, were bought from Mr. Joseph Philip, an Indian living on Indian island: a simple point made of bone, Plate V, figure 13; a harpoon point with four notches, made of part of the wall of a large bone; a bone harpoon point with a hole through the tang, Plate VI, figure 11; an awl made of bone; and a bone object with both ends broken off, but bearing notches, Plate XIX, figure 17. They are catalogued under Nos. VIII-B-450—VIII-B-454.

Shell-heap C (Figure 1) is a very small heap on Mr. Norman Campbell's farm, on the northeast side of a little cove on the mainland south of Indian island, between the island and West Merigomish. It was only about 6 inches high at the deepest point and perhaps 10 by 20 feet in extent. The pestle-shaped hammer pebble, Plate XIV, figure 7, was found here.

Shell-heap D (Figure 1) is near the boat landing on Mr. Donald McDonald's farm, on the western part of Olding island, formerly and still locally called Point Betty island. It extended along the beach of the most southern bay on the island *(See* Plate I A).

This heap was about 100 feet long by 50 wide, and 17 inches in maximum height near the western end. The writer excavated it to the bottom (Plate II B) over an area of 100 by 37 feet. The remaining 13 feet of its width, being shallow, had been repeatedly turned over by the plough and did not seem worth exploring, as many of the specimens would be moved, broken, and mixed with material of recent culture thrown on the land with the manure. At one time the heap was wider towards the sea, the southern edge being undercut by the waves (Plate I A).

The site is on a low, nearly flat space (Plate I A), sheltered by a hill to the west by the north slope, and partly by a little hill to the southeast. Canoes could be landed and sheltered in the little bay in front.

The shells composing this heap are shown in Plate II B, resting on natural yellow soil, and are chiefly those of the quahog, the oyster, and the common mussel. Shells of the hen clam, soft-shelled clam, the basket shell, the moon shell, a periwinkle *(Lunatia)*, of unknown species, and the boat or slipper shell were less common. Shells of the spotted land snail *(Patula alternata)* were found, but these snails probably crawled into the heap recently.

Mr. McDonald had found a chipped stone point for a knife, many celts made of stone, and a few bone awls. Of these he presented to the Museum a blade chipped from stone for a knife, a long point made of bone, and a celt made of stone. These are catalogued under Nos. VIII-B-33 to VIII-B-35.

Shell-heap E is near Mr. Donald McDonald's barn on the east side of the southwestern part of Olding island. It is an eighth of a mile north of heap D, from which it can be reached by crossing the base of an easterly point on comparatively level land. It is at the head of a little bay, where

canoes would be sheltered and where there is a clam bed. It is sheltered from the east by a hill. The shells found on the surface are chiefly quahog, oyster, and mussel; shells of soft-shelled clams are less common. Some shells, especially those of the mussel, may have been carried there recently by birds. There were also collected from the surface of this heap : a piece of a light grey quartzite pebble, chipped along one side and broken off at one end—apparently a chipped blade rejected or abandoned in process of making; a large piece of chert partly chipped; a celt made of stone; another celt used as a hammer until two facets had been formed; and a scraper chipped from chert. These are catalogued under Nos. VIII-B-455 to VIII-B-468.

Shell-heap F (Figure 1) is about 40 feet long, 10 feet wide, and 1 foot high. It is at the top of a bank, perhaps 12 feet high, cut by the surf on the west side of a small, blunt, southerly point south of the Olding barn, near the middle of Olding island. This site with its southwesterly exposure may formerly have been sheltered by woods to the north and east, as well as by the gradually rising land in that direction.

Shell-heap G is about 20 feet long by 5 feet wide by 1 foot high, and is situated on a low bank on the east side of the small, southerly, blunt point south of the Olding barn. The surf undercuts the eastern edge of this heap. The site, being on low land at the head of a small bay, was sheltered from all directions except the water to the east. The heap is composed of dark refuse and the shells of the oyster, mussel, soft-shelled clam, hen clam, and boat shell. In 1913 W. J. Wintemberg collected at this place: teeth of bear, beaver, and woodchuck; at a depth of one foot a small, spherical pebble with two sides battered; and on the beach two adzes made of stone. These are catalogued under Nos. VIII-B-362 to VIII-B-364.

Adzes made of stone have been found by Mr. Charles Smith on his farm on the mainland, about $1\frac{1}{2}$ miles southwest of Merigomish. Two of these (VIII-B-26) he presented to the Museum.

Wigwam Site. A single wigwam site is said to be located at Hardwood point, about three-quarters of a mile north of Merigomish. The spot is among alders, about 150 feet back from the beach and about the same distance west of the east line of the Olding farm. It is probably the site of a modern Micmac Indian camp.

Finds on Big Island. Three adzes made of stone, and a pipe made of stone, possibly modern, are in the Patterson collection, catalogued as from Big island. The pipe is illustrated in Plate XX, figure 8.

Shell-heap H (Figure 1) is a small heap on the southwestern side of a little swampy bay, on the north side of the mouth of Savage cove, the second little bay from the west on the southern side of Big island.

Micmac Cemetery. There is a consecrated French and Indian cemetery on the high land at the south side of Big island, on the north side of Savage cove. It is $1\frac{5}{8}$ miles northwest of Merigomish and a quarter of a mile east by a little north of heap H. Patterson states (b, page 30) that it was used as a cemetery by the Micmac Indians until about 1837; but he gives

its location as about half a mile west of the prehistoric cemetery next described, whereas the writer found it to be three-eighths of a mile northwest across the cove.

Prehistoric Cemetery. A prehistoric cemetery was located on the farms of Mr. James McGlashan and Mr. Donald McGregor, the McGregor land now being owned by the son, Mr. George McGregor. Patterson claimed that it had been disturbed in a search for specimens before he excavated it, and a number of stone axes (probably adzes) and arrowheads taken away. He states (b, pages 29, 30, and 31);

"Mr. Donald McGregor of the Big island, in ploughing a spot in his field, where the vegetation was ranker than usual, turned up a human skull.[1] On examination, there was found a mass of human bones much decayed, among them a skull, transfixed by a flint arrowhead, which yet remained in its place. Along with these remains were a large number of ancient implements, stone axes, flint arrowheads, etc., but none of them giving evidence of intercourse with Europeans . . . .

I visited[2] the place in 1874. The spot is small, not more than 8 or 10 feet in diameter, and as soon as the ground is turned, it will at once be distinguished from the surrounding soil, being a loose black mould, containing fragments of bone so decayed that they can be crushed between the fingers . . . This pit, if it can be called such, is very shallow, being not more than 15 to 20 inches deep. At the bottom I found decayed fragments of the birch bark, in which, according to the custom of the ancient Micmacs, the dead were laid. Below this was a hard subsoil, which plainly had never been disturbed . . . . .

One curious fact was manifest in this cemetery, which has not hitherto been noticed in connexion with Micmac customs, viz., the use of fire in some way in connexion with the dead. Some of the graves give no indication of this, and in one I was able to trace the position in which the body had lain, viz., on its side in a crouching posture. But in other cases the remains were mixed with ashes, small pieces of charcoal and burnt earth, showing the use of fire for some unexplained purpose. In another I found just a quantity of ashes with small fragments of burnt bones, none of them an inch long. The whole had been carefully buried, and were probably the remains of some captive whom they had burned."

In another place (c, page 675) he states:

"I could see no plan of arrangement in the graves. They would be found at distances of from 3 to 5 feet apart, and over a space of about 50 feet square, lying to the west of a pit. I was not able to find any to the eastward, that is farther away from the shore. The graves formed a layer of brown, velvety mould, 2 or 3 inches deep, and containing fragments of bones. The ground is gently sloping and facing southwestwardly. In only one instance could I detect the posture of the body. This one was lying on its side, and doubled up. In other instances there were plainly a number together, and the bones were so decayed and seemingly so mixed, that I could not trace any order. I did not particularly observe, but I think the body lay north and south with the face to the west. The graves were shallow, not more than from 9 to 12 inches deep. There was no evidence of desiccation.

In all these cases with a single exception,"

Patterson (a, page 233, b, page 30)

"found prehistoric implements, stone axes [probably adzes], knives, arrow and spear heads, portions of bone spear heads, small copper knives, with fragments of pottery,"

and a broken pipe. He states (a, page 233) that

"It thus appeared that the people to whom these remains belonged had the practice. . .of burying with the dead the implements which they were accustomed to use when in life."

[1] Afterwards lost, according to Patterson (a), p. 231.
[2] The commencement of Patterson's archæological work. Cf. Patterson (a), p. 232.

In the Patterson collection, catalogued as from this prehistoric cemetery, are : two pieces of hammered copper ; chips of stone ; four points chipped from stone; a leaf-shaped point chipped from stone; three stemmed points chipped from stone; three points made of bone; two harpoon points made of bone with a hole through the tang of each; three knives made of copper; fragments of pottery; part of an object made of stone; eight adzes made of stone; an implement made of bone or antler; a pointed four-sided object made of stone (Plate XX, figure 3); a pipe made of stone (Plate XX, figure 7); and pieces of artifacts.

Mr. George McGregor said that Micmac Indians had recently camped on the beach nearest to this site, that is, southwest of it, as they do at various places around the harbour where they sometimes obtain basket material.

The writer re-excavated the circular site, which was about 10 feet in diameter, and secured the following pieces: five fragments of burned skull bones, probably human; a section of a charred human upper arm bone; a charred human knee cap; seven fragments of charred bones, probably human; charred birch bark; four chips of metargillite, two of them burned; three butt fragments of notched and barbed points chipped out of metargillite, three tips and a middle section, making a total of seven; one reject chipped from quartz with base broken off and missing; one fragment of a reject bearing a barb; a thick, coarse reject with point missing; one butt broken from a notched and barbed point of grey quartzite; four fragments of burned harpoon points, barbed on one edge, made of bone, one of which is illustrated in Plate VI, figure 17, and two of which are notched across the barbed edge, one of them having on the back edge a row of shallow pits, apparently decorative; a fragment of a burned harpoon point, barbed on one edge and notched across its front edge and rear edges (Plate VI, figure 20) ; a fragment of a thin burned object, lenticular in section, made of bone, possibly an awl or needle, but probably the tip of a barbed harpoon point; two burned harpoon points barbed on both edges and made of bone (Plate VIII, figures 1 and 2); two burned fragments, apparently sections of shafts of such points; twenty-one fragments of pottery; two fragments of an adze made of stone; a piece of burned bone showing longitudinal grooving and breaking; and a fragment of burned bone with both ends missing, roughly rectangular in section, broken on one side, with two sides apparently plain, although one of them is much injured, and the fourth side bearing a longitudinal row of pits, probably a decoration. These are catalogued under Nos. VIII-B-668 to VIII-B-690.

Shell-heap I (Figure 1). Most of this heap has been washed away by the sea, so that it is now only about 10 feet long by 5 feet wide by 1 foot high. It is situated on the farm of Mr. George McGregor, on Big island. It was dug over by Patterson (b, pages 29-31), and very little has been found there since. Mr. McGregor states that he remembers when Indians camped there, but as even to this day they move about the harbour, camping practically where they choose, their location near the old shell-heap may have no historical significance. Wintemberg found the shells of the oyster, quahog, other clams, and *Crepidula fornicata,* three chips of stone, and a

leaf-shaped point chipped from stone, which are catalogued under Nos. VIII-B-30 and VIII-B-29. Mr. McGregor found and presented a point chipped from chalcedony, catalogued under No. VIII-B-31.

Shell-heap J (Figure 1) is a small and unimportant shell-heap, on a flat on the west side of Smashem head. It was reported by Mr. Malcolm de Wolfe.

Shell-heap K (Figure 1) is on the land of Mr. Daniel McLean, on the low part of the bluff west of Robinson point. It was about 5 feet above the beach and undercut by the waves at high tide. The writer excavated this heap and collected: a chip of clear quartz; three samples of animal bones; an incisor of a porcupine; a canine tooth of a seal; four fragments of pottery, one of which is illustrated on Plate IX, figure 8, apparently from three pots; a knife made of an incisor tooth of a beaver; two fragments of shafts of simple points made of bone; and a fragment of an object made of bone similar to the one illustrated in Plate VII, figure 8. These are catalogued under Nos. VIII-B-691 to VIII-B-698.

Shell-heap L (Figure 1), about 40 feet long by about 13 feet wide by about 1 foot high, is on the west side of the south point of Finlayson island, part of the estate of Mr. Edward F. Finlayson. It was formerly wider, now being undercut on the west by the surf. It was only about a sixteenth of a mile across a comparatively low part of the south point of the island from heap M. The site is on low land sheltered between two bluffs to the northwest and southeast, and protected by the forest on the slope to the northeast. It was completely excavated, but yielded little besides shells. These, and the black dirt, were in about the same proportion as in the other heaps on the harbour (*See* Appendix III).

Shell-heap M (Figure 1) was about 80 feet long by 20 feet wide and 14 inches high, and was situated on the east side of the south point of Finlayson island. It was situated less than a sixteenth of a mile east across the low part of the south point of the island from heap L, and less than half a mile southwest from heap N. It was on a flat about 5 feet above the beach, undercut by the waves, and sheltered from the south by the bluff at the southern end of the point and to some extent from the west and north by the forest on slightly rising land. It had been ploughed at least once, but was covered with trees. All of it was excavated and found to be composed of black refuse and shells, chiefly those of the quahog, oyster, and mussel. Shells of other clams, the moon shell, and another gasteropod were less common (*See* Appendix IV).

Shell-heap N. Shell-heap material occurs all along the slope of the southern shore of Pig island, which is owned by Mr. Daniel McGregor. This material has been undercut by the waves and is caved off in large pieces at various places. The shore is sheltered from the north by higher land (*See* Appendix V).

Shell-heap O (Figure 1) is a small heap on the farm of Mr. Peter A. Millar, on Kerr point. Kerr point is a 40-foot bluff with the land sloping to the south. The heap is on the southern exposure sheltered from the north, with a little stream below, and the nearest beach is along Huggan

gut, to the east. It is perhaps 30 feet long by 30 wide. Patterson (a, page 241) estimated it to cover three-fourths of an acre. Mr. Millar states that the height was not more than 18 inches, and it is now much less because some of it has been used as fertilizer. Patterson (a, page 241) states that oyster, quahog, shoft-shelled clam, and mussel shells were found in it. He secured most of the specimens found on the farm during ploughing and fertilizer digging. The majority of the specimens in the Patterson collection are from the part of this farm on Kerr point[1]. In 1913 and 1914 Mr. Millar presented to the Museum most of his remaining specimens, consisting of : a point chipped from chert with stem lacking ; a heavy, thick, leaf-shaped object chipped from metargillite—possibly a reject; a harpoon point made of bone; two fragments of pottery; and four entire adzes made of stone, one of them unfinished. These are catalogued under Nos. VIII-B-27, VIII-B-28, and VIII-B-829 to VIII-B-835. Mr. Millar, probably, saved only entire specimens, so that broken adzes are likely to have been as common here as elsewhere. He had a large vertebra of a small whale. In the Patterson collection, catalogued as from this shell-heap, are teeth of moose and beaver, pieces of antler and ivory, and thirteen adzes made of stone. Catalogued as from the Millar farm, but probably from shell-heap O, are: split bones; an ivory tusk; ten chipped blanks; two leaf-shaped points chipped from stone; another 7½ inches long; two stemmed points chipped from stone; thirty points chipped from stone—making a total of forty-five chipped points; four points made of bone; two harpoon points of bone and a fragment of a third; fragments of pottery; a piece of iron pyrites, probably for striking fire; a receptacle made of bone; twenty-four adzes made of stone, three of them being broken and one grooved on the side edges; four awls made of bone; a needle of bone; three large objects, possibly flakers, made of walrus ivory, one of which is illustrated on Plate XX, figure 4; an object 8 inches long made of antler or ivory; and articles of European origin.

Shell-heap P (Figure 1), a small heap, perhaps 100 feet long by 10 feet wide and 8 inches high, undercut and partly washed away by the surf, is located on the lowland immediately southwest of Smith point, 3¾ miles northeast of Merigomish. A piece of iron chain, probably intrusive, was found in this shallow heap[2], and a barbed point of mottled red and white chalcedony.

Find in Barney River. A notched point, chipped from quartz, for an arrow, in the Patterson collection, is catalogued as from the bed of Barney river.

Shell-heap East of Barney River. This small and unimportant shell-heap, on the east side of Barney river, on a place owned by Mr. McDonald, was reported by Mr. Malcolm de Wolfe.

Shell-heap on the Arbuckle Farm. According to Mr. Donald Simpson of Merigomish, a shell-heap exists on the shore 6 miles east of Merigomish, on the farm of Mr. George Arbuckle of Central Ponds.

[1] Cf. Patterson (a), p. 241.
[2] Cf. p. 10.

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Burial Place or "Battle Fields". A site at the east side of the Barney River bridge at Ocean, is thought by Mr. Wallace Copeland of Merigomish to be a burial place or "battle field", because many bones have been ploughed up at the place. He made the statement on the authority of Mr. George Patterson, of Merigomish.

Supposed Earthwork. A supposed earthwork, locally known as the "Boar's Back," near Barney river, is reported by Mr. Copeland. He made the statement on the authority of Mr. J. E. Mason of Central Ponds, who believed the earthwork to be artificial. Patterson (b, page 34) relates a tradition recorded by Rand to the effect that at the time of the last war there, in which the Micmacs of the harbour fought other Indians, the Micmacs were entrenched in a blockhouse or fort at the mouth of Barney river. "These blockhouses were constructed of logs raised up around a vault first dug in the ground."[1] He further states: "the old Indian fortifications were a sort of palisaded enclosures, formed of trees and stakes driven into the ground between them, with branches of trees interlaced" and that "in times of war the women and children were always kept in such fortifications," but that after obtaining axes from Europeans they may have made one like the blockhouse above referred to. This supposed earthwork, however, is probably natural or made by white men, as earthworks of aboriginal origin are not known[2] in the Maritime Provinces or nearer than Massachusetts.

Possible Workshop. According to Mr. Finlayson, of Merigomish, many chipped points for arrows and a very great number of chippings have been found on Thomas Patton's point, now owned by Mr. R. Patterson, at Lower Barney river. The site may have been a workshop where stone was chipped into points for arrows, knives, and scrapers.

Finds on and in Merigomish Harbour. Four adzes made of stone and two awls made of ivory, in the Patterson collection, are catalogued as from a shell-heap on Merigomish harbour, and an implement made of bone in the Patterson collection is catalogued (Cat. No. 203) as from a mussel bed in the harbour.

Other Archæological Sites. Archæological sites are not confined to the immediate neighbourhood of Merigomish harbour, but are found also along the shore to the west, and on Prince Edward Island to the north, although none is known along the seaside to the east or back from it nearer than Antigonish[3]. A few of the nearest sites to the west are mentioned in order from east to west.

Shell-heap on Black Point. A small shell-heap, near the shore at "Black point" on the farm of Mr. Alexander G. Reid, near Little harbour, was visited by W. J. Wintemberg, on August 2, 1913. It was obscured by sod. Mr. Reid said it was 30 feet long by 20 wide by about 1 foot high, and that the shells are mainly of the large clam, *Spisula solidissima.* Mr. Reid has found stone adzes and chipped stone points for "spears" and arrows on his farm. He presented to the Museum a large, leaf-shaped point chipped from stone, and an adze. These are catalogued under Nos. VIII-B-21 and VIII-B-20.

[1] Cf. Patterson (c), p. 673.
[2] Cf. Patterson (c), p. 673.
[3] *See* Patterson (a), p. 238.

Shell-heaps near Reidway. Several small shell-heaps occur in a field back from the shore, on the farm of Mr. Daniel McGregor, near Reidway post office. Here Mr. McGregor has ploughed up many points, chipped from stone, for arrows, spears, and knives, and has also found celts made of stone. A leaf-shaped point chipped from white and pink quartzite, a leaf-shaped point chipped out of stone, and two tanged points chipped out of stone, found near Reidway by Mr. McGregor, were presented to the Museum and are catalogued under Nos. VIII-B-22 to VIII-B-25.

Little Harbour. Patterson states (b, page 34) that the time of the last Micmac-Abnaki war in this county, the Abnakis fortified themselves in two blockhouses at Little Harbour.

Sites on Pictou Harbour. There are a number of sites on Pictou harbour, at the beaches and at Fisher grant[1]. In the Patterson collection there is an adze made of stone from the beach at Pictou, a fragment of an adze made of stone from Town gut, two adzes made of stone, one of them double-bitted, from Big gut, East river, Pictou. In the same collection from East river, Pictou, are two adzes made of stone, one of them grooved on the rounded side of the head.

A shell-heap, the site of old camp fires, composed of oyster, clam, and mussel shells, was found on the land of Mr. Ives, on Ives point, on the east side of East river, Pictou, when the branch railway to Pictou Landing was under construction, and three stone axes were presented by Mr. Ives to Mr. Harris, an engineer on the construction. Adzes rather than grooved axes are probably meant by the word axes. Several slate knives were found on excavating about 18 inches. The above information is taken from an article by Mr. D. McLeod, published in the Pictou Advocate (September 14, 1912). W. J. Wintemberg visited the place on July 30, 1913, but could find no traces of the site.

Stone axes or celts, and knives, were found a few hundred yards north of Indian Cross point, a little below Ives point.

A shell-heap is located on the west bank of East river, Pictou, at South Pictou on the farm of Mr. William Dunbar, where oyster shells have been found, according to Patterson (b, page 28, and c, page 673). Two adzes made of stone, one of them double-bitted, from South Pictou, are in the Patterson collection.

Shell-heaps were located at Fraser point, on the farm of Mr. Hugh Fraser, and at Middle River point, on Mr. McKay's farm, according to Patterson (b, page 28, and c, page 673), who states that at these places shells have been ploughed up. There are seven adzes made of stone, from Middle River point, in the Patterson collection.

A gorget from Green hill, near Sylvester, is catalogued under No. 86 in the Patterson collection.

Shell-heap on McKenzie Farm, Caribou Island. There is a shell-heap about 100 feet long and 20 to 25 wide, on the farm of Messrs. William and Daniel McKenzie, on the shore of a small cove near Gull rock, Caribou island. Mr. William McKenzie stated that it was composed of refuse and shells to a depth of about 2 feet, but ploughing has reduced it to

[1] Cf. Patterson (c), p. 673.

about 8 inches. W. J. Wintemberg found it to be composed of dark-coloured refuse, shells of the oyster, clam, and boat shell, and broken bones. He collected five chips of stone and ten specimens of bones and teeth, now catalogued under Nos. VIII-B-15 and VIII-B-16. Mr. McKenzie told him that numerous bones of large animals had been found, including whole skulls, not of bear but possibly of walrus. Chipped stone points for arrows, celts, and a grooved stone ax had been found there by Mr. McKenzie, who presented a broken chipped point to the Museum (Cat. No. VIII-B-18). A crude celt, found by Mr. Findlay McKenzie on his farm about one-half mile farther west, was presented by him to the Museum (Cat. No. VIII-B-17).

Shell-heap on McLeod Farm, Caribou Island. A small shell-heap is situated on the farm of Mr. Daniel McLeod, on Caribou island, according to information received from Mr. Joseph Fraser of Caribou island.

Shell-heap on Fraser Farm, Caribou Island. A small shell-heap, now entirely washed away, existed on the high cliff at the west end of the farm of Mr. Joseph Fraser, Caribou island, according to Mr. Fraser, who stated that he had found chipped points for arrows, celts, a double-bitted adze, and grooved axes.

Site at Tatamagouche. There are evidences of occupation at Tatamagouche, according to Patterson (c, page 673).

ANIMAL AND PLANT RESOURCES OF THE PREHISTORIC PEOPLE

The prehistoric people of Merigomish harbour depended on a variety of natural products, but no indications were found that they relied particularly upon any one staple. Some of the materials used are suggested by the specimens found in the shell-heaps. Bones were not numerous.

FOOD

For food they could choose from the ordinary mammals, birds, and fishes. They ate black bear, moose, deer, dog, raccoon, woodchuck, porcupine, beaver, muskrat, rabbit, squirrel, whale, seal, walrus, birds, and fish, as shown by the bones or teeth of these animals found in the heaps.

They ate shell-fish in great quantities, the same kinds that are today considered edible, although they ate a larger proportion of mussels than is now customary. Perhaps they also prepared them at the shell-heap localities for transport to other places, or for barter. The shells of quahog, clam, hen clam, soft-shelled clam, oyster, and the common mussel were found in great quantities. The shells of horse mussel, moon shell-fish, boat shell-fish of several kinds, and a spiral shell-fish, were less numerous. No ridged shells of the mussels commonly known as plaited horse mussels *(Modiola (Brachydontes) demissa* Dilwyn) were found in any of the heaps, although this mussel is now numerous in the tidal ponds behind the spit on the western end of Olding island. Some of the oyster shells found in

heaps A and D are more than 6 inches long. The people of the neighbourhood were surprised by their size and by the fact that they were there at all, although the writer found a few oysters living in the water near these two heaps. None, however, was as large as the shells found in the heaps.

Gnawing, or what appears to be gnawing, shows on some of the bones found in these heaps and suggests that the Indians who left them had domestic dogs. The toe bone from heap A, Plate XVIII, figure 10, seems to be gnawed at both ends. A beaver jaw from heap A shows longitudinal cuts in several places, possibly made in cutting up the body. However, here as elsewhere, cuts made in securing meat, rather than in the process of using the bone as material, are uncommon. Some long bones found in the heaps had been broken lengthwise, as if to secure the marrow. A few pieces of bone found in heaps A, K, M, and N, and in the prehistoric cemetery, had been charred. Some of these bones had been worked.

That fish also were used for food is suggested by the objects made of bone considered to be fish rake teeth and fish-hooks, or barbs for fish-hooks, and by the harpoon points, which may have been used for spearing fish. Fish bones, especially the larger ones, are rather scarce. Possibly the people were not skilled in taking large fish, and perhaps no offshore or deep water fishing was done.[1]

No remains, charred or otherwise, of corn, beans, or nuts, or of any wild or cultivated plant foods, were found, and it is thought that in prehistoric time the Micmacs did not cultivate corn, although Patterson (b, page 27) states that when the English settlers arrived the Micmacs raised a little Indian corn and a few beans on clearings at their principal place of encampment on the east side of the mouth of Barney river. On the other hand, Gilpin states (page 222) that tobacco was not planted by the Micmacs in Nova Scotia, and in fact, though they knew how, no planting of any kind was done east or north of Kennebec river, Maine, after the Indians could get biscuits from the French.

MANUFACTURED ARTICLES

Articles of Stone and Mineral

For raw materials for the manufacture of tools and other objects, the prehistoric people depended upon minerals, stone, copper, clay, bones, antlers, teeth, shells, and plant substances. We found no objects that suggest trade or conquest, although Piers (a, page 101) mentions that a few implements of unmistakably southern workmanship have been found in the province.

Metargillite and pebbles of quartz were the materials chiefly used for chipped points for arrows, knives, and scrapers, but chert, chalcedony, jasper, and quartzite were also used for the same purposes. Some of the quartzite is mottled. This, of course, produces two differently coloured materials, namely, that seen in the tanged point (Plate IV, figure 13), and that in the lozenge-shaped object (Plate III, figure 14). Sandstone was made into whetstones. Slate furnished the material for a surface on which to incise pictures (Plate XIX, figure 14). Pebbles were used as

[1] Cf. Gossip, p. 95.

hammerstones, and were chipped, pecked, and ground into celts. Ferruginous argillite (Plate XIX, figures 1-3), found in heaps A and D, was possibly used for paint for the face or body. A fragment of hematite found in heap D and siliceous hematite found in heap N were probably used for red paint. Schist carrying specularite, found in heap D, may have been used for glistening reddish black paint. Graphitic schist and argillite, such as was found in heap D and is illustrated in Plate XIX, figure 4, probably furnished black pigment. No mica was found. A nodule of manganese-iron ore was found in heap A. There is a piece of iron pyrites in the Patterson collection which, according to the catalogue, was found on the farm of Mr. Peter Millar, probably in heap O; it may have been used for striking fire.

Of metals, only copper was found. It is represented by only two specimens: a point for an arrow, barb, awl, or needle, found in heap A (Plate VII, figure 3); and an object pounded to rectangular section, possibly a point for an arrow, barb, awl, or unfinished needle, found in heap L (Plate VII, figure 4). Two pieces of hammered copper in the Patterson collection are catalogued as from the prehistoric cemetery. Another specimen of copper from the same place is a small, thin knife-blade in the United States National Museum (Cat. No. 34169). Patterson states that "there are three specimens in the collection besides pieces of copper hammered out as if intended for the formation of similar ones", and he believed that more copper knives had been found in this cemetery than in all the rest of Nova Scotia (a, page 235).

Native copper was used in Nova Scotia, according to Sir J. W. Dawson (a, page 41). Eighteen specimens, comprising eight copper nuggets, several of which appear to have been hammered, two pieces of sheet copper, rough knife-shaped objects, and six small "piercers", all of the native copper of the trap of the bay of Fundy, have been found at Backman beach, Lunenburg county, according to Piers[1]. These are Cat. No. 75 in the Provincial Museum, Halifax. Patterson (a, page 235, and c, page 676) refers to both knives and beads made of copper that were found in Lunenburg county. Besides these, a shaft of copper, square in section but pointed at both ends, was collected from a shell-heap at cape d'Or by Mr. C. H. Mills, and two small copper nuggets were found in the Eisenhauer shell-heap.

Clay was used for making pottery, which was fashioned into vessels, but not into strainers, spoons, pipes, disks, beads, nor into various modelled forms on the edges of the vessels.

Articles of Bone

The bones, antlers, and teeth of animals were used as material for various objects, and the skins no doubt were made into garments and other useful things. The following species are represented by the remains found: moose, deer, black bear, wolf, dog, beaver, red fox, raccoon, lynx or wild cat, porcupine, woodchuck, squirrels, rabbit, muskrat, whale, seal, walrus, unidentified birds, and fish.

Bone was used in considerable quantity for implements, but only for a few kinds. Implements of bone are said by Piers (a, page 116)

[1] Cf. Piers (a), p. 116, and (b), p. 288.

to be uncommon in Nova Scotia as a whole, there being only a few specimens, including "piercers" and "fish-spears", in the Provincial Museum and in the Patterson collection in Dalhousie University. The scarcity of bone implements may be more apparent than real, because most collections, unless made by experienced persons and from fresh excavations, contain only objects more readily recognized and less destructible by weather and agricultural operations[1] than those of bone. Bone is the material of more than 150 simple points, more than 50 harpoons, and more than 100 awls. A rib of a whale furnished material for the object considered as a bark peeler, on page 20, or a club, on page 76 (Plate VII, figure 13), and at least two wedges are of the same material. The metacarpus and the metatarsus of deer were made into awl-like implements. Large, thick bones furnished the material for points thought to be for arrows, harpoons, and awls; hollow bird bones for awls, and thin walled bones for what are considered, on page 65, to be needles. Fragments of the large bones of large mammals and small fragments of various bones were commonly found in the heaps. Ulnæ of the fox and raccoon were used to make awl-like implements. Bone furnished the material for what are considered, on page 35, to be fish-hooks, and for a number of objects of unknown use. Toe bones of moose were perforated through the joint surface of the far end, for use probably in a game similar to "ring and pin".

Articles of Antler

A cylinder and a few wedge-like or chisel-like objects are made of antler. Antler was not identified as the material of any of the simple points, harpoons, or awls. The cylindrical object of unknown use, illustrated on Plate XIX, figure 20, and bearing incised geometric and pictographic marks, is made of antler.

Articles of Teeth

Canine teeth of the bear, and at least one each of the wolf and the seal, and one incisor tooth of a moose were made into pendants by perforating the tip of the root. A canine tooth was made into an object considered on page 20 to be a fish-hook. An incisor tooth of a moose was rubbed on each side edge of the root, as described on page 69. Beaver teeth were sharpened in various ways, and some were cut off at the back and across the root, apparently for use as knives. Bear teeth were cut in two, lengthwise, for some unknown purpose. A shark's tooth found in heap A was made into what is considered, on page 26, to be a point for an arrow (Plate V, figure 22).

Walrus ivory was used for making some objects. Four pieces of this material were found in heap A. One is a piece of raw material, a tusk lacking both point and base; another is a piece in process of cutting in two by grooving and breaking (Plate XVIII, figure 13); the third is a piece that has been cut off by this process (Plate XVIII, figure 12); the fourth is a fragment of the shaft of a simple point, harpoon, or awl. The catalogue of the Patterson collection states that a piece of ivory was found

[1] Cf. Smith (b).

in heap O, and that the large object made of walrus ivory, illustrated on Plate XX, figure 4, was found on the Millar farm, which probably means in heap O. There are also in the Patterson collection two awls made of ivory, from Merigomish harbour. Pieces of walrus ivory are said to be uncommon in Nova Scotia as a whole, there being only a few specimens in the collections in the Provincial Museum and Dalhousie University: and Piers[1] states that these include harpoon points made of ivory, similar to those used by the Eskimo.

Articles of Shell

Shell was found in rather large pieces as tempering in the pottery, but no spoons, scrapers, beads, pendants, disks, or pins made of this material were found, and Patterson (a, page 251) found no implements in Nova Scotia made of shell. In fact, objects made of shell are rarer in the shell-heaps and elsewhere on the Atlantic and Pacific coasts of Canada than they are in the mounds of the interior of the continent.

Articles of Plants

Charcoal and wood ashes were found. The cord suggested by the impressions upon the outer surface of pottery was probably of plant fibre. No implements for the gathering of vegetable fibre were recognized, though objects were found (Plate VII, figures 9, 10, 13) that closely resemble the bark peelers of the Pacific coast.

IMPLEMENTS USED IN THE SECURING OF FOOD

The implements used in procuring food, so far as illustrated among our finds, were for hunting, fishing, and possibly for gathering plant food. They include chipped stone and rubbed bone points, a point made of a shark's tooth, barbed harpoon points of rubbed bone, possibly two points made of copper, peculiar objects made of bone, and a canine tooth. Spears or javelins are not mentioned by Lescarbot[2] as being used by the natives of this region, and though the points chipped from stone may not have been used on spears, many of the simple points rubbed out of bone, and certainly the barbed points made of bone, were used on harpoons. The Micmacs of today use a harpoon for taking eels (Plate XXI, figure 1). We found no undoubted fish-hooks, but the smaller of the simple points of bone may have been so used, as well as the two copper points shown on Plate VII, figures 3 and 4, and the peculiar objects made of bone and a canine tooth described on page 67 (Plate VII, figures 5-8). There was no evidence of nets. No objects known to have been used for gathering wild-plant foods, or to have served as agricultural implements, were found, unless some of the large pieces of bone and antler (Plate VII, figures 9–11, 13) are bark peelers. Possibly agricultural work may have been done with wooden digging sticks, long since completely decayed.

[1] Cf. Piers (a), p. 116.
[2] Cf. Gilpin, p. 222.

Many of the points for arrows, harpoons, and knives may have been used in warfare as well as for hunting, and some of them in various industries. The stone celts—especially the notched celt—hammerstones, and three notched hammers, may have been used as axes or as club heads in hunting or warfare; no grooved club heads or grooved axes were found. Some of the objects considered as awls, on page 64, may have served as daggers or even as spear points. The large piece of a whale rib (Plate VII, figure 13) may have been used as a club in hunting or in war.

Chipped Stone Points

Points chipped out of metargillite, quartz, quartzite, and chalcedony were used for arrows and knives employed in hunting. One hundred and ninety specimens were found. One hundred and twenty-two were of metargillite, four of quartz, eight of quartzite, three of chalcedony, and fifty-three of unidentified stone. The various styles of chipped points and the range of sizes are shown on Plate III, figure 15, and Plate IV, figures 1-20. They vary in size from the one illustrated on Plate IV, figure 20, which is $1\frac{5}{16}$ inches long, to the one illustrated on Plate III, figure 15, which is $6\frac{5}{16}$ inches long.

Three of the specimens chipped from metargillite are long, leaf-shaped points (Plate III, figures 10, 15); twelve are short, leaf-shaped points (Plate III, figure 9, and Plate IV, figure 6); six are coarse, triangular points; five are heavy, triangular to leaf-shaped points (Plate IV, figures 1 and 2); six are fine, triangular points (Plate IV, figures 3-5); ten are crude, small, triangular to leaf-shaped points; four are tanged, lozenge-shaped points (Plate IV, figures 10, 11); five are tanged points (Plate IV, figures 8, 9); fifteen are notched points (Plate IV, figures 14-20); and one is a trapezoidal chipped object, possibly used as a knife (Plate XVI, figure 7). Twenty-seven are tips broken from points. There are five points from which both tips and bases are missing. Twenty-one are the butts broken from points, and two are chips of chipped points.

It will be noted that about forty specimens are leaf-shaped or triangular and about thirty are tanged or notched; also that about twenty specimens are of bases and thirty of tips, which suggests that one out of every three points that had their tips broken off and lost was re-tipped.

One of the four specimens made of quartz is a tanged point chipped out of clear white quartz (Plate IV, figure 12), two are barbed points from heap A, and one is a notched point.

Of the eight specimens made of quartzite: one is a leaf-shaped point; one a triangular, leaf-shaped point; one a tanged point of pink quartzite (Plate IV, figure 13); one a specimen with the point shorter than the tang (Plate IV, figure 7); one a notched point of grey quartzite; one the butt broken from a notched and barbed point of grey quartzite; one a barbed point with tip lacking, chipped from maroon quartzite; and one a tip of a point of maroon quartzite.

Of the three specimens made of chalcedony, one is a tanged point chipped out of white and pink chalcedony, one is a barbed point of mottled white and pink chalcedony, and the third is the tip of a small point.

The smaller points were probably used chiefly as heads for arrows. Some may have been used as harpoon tips and a few as knives. The large

points were probably used as knives, as no other large knives were found, the few knives made of copper and those made of beaver and woodchuck teeth all being small. But it must not be forgotten that knives made of bark may have been used, as among the Iroquois. The points with notches and stems and possibly the others also may have been hafted. That they were used as spear points is possible, but Lescarbot describes no such spears and Denys refers only to spears with bone points.

No caches of chipped points, or of any other class of objects, were found on the harbour.

In general the chipping of the points is neither of the most crude nor of the best workmanship found on the Atlantic coast of America. It is crude as compared with chipped stone work of the interior of both Canada and the United States. No points have noticeably serrated edges.

Throughout Nova Scotia, according to Piers (a, page 111), points chipped out of stone for arrows are comparatively common, and most of them are of siliceous stone, a large proportion in the general collection in the Provincial Museum being chipped from quartzite. They are leaf-shaped, notched, and stemmed, and large points are less numerous than small ones. In the Peabody Museum of Harvard University there are from Nova Scotia about fifty points chipped from stone for knives or projectiles.

Manufacture of Chipped Stone Points. Extensive manufacture of chipped points apparently did not take place at the sites on Merigomish harbour, although a few angular pieces of metargillite, quartz pebbles, chips, very roughly chipped pieces of stone such as might be termed rejects, and a few other specimens were collected. The method of manufacture is partly illustrated by a series of specimens, chiefly of metargillite and quartzite, selected from the objects found in the shell-heaps.

Hammerstones (Plate XIV) were, probably, used to break the pieces of raw material into suitable form and for roughly chipping them. The pin-shaped object made of antler, illustrated on Plate XVI, figure 6, may have been a percussion tool used as a chipper. Chips (Plate III, figures 3 and 4), the refuse from the process of chipping, were found. Points roughly chipped into form, but lost or rejected because of some fault in the material or accident in chipping, were found (Plate III, figures 7-14). The fine flaking which completed the work was probably done with a flaker made of bone or antler, which may have been buried in ashes or otherwise treated so as to remove the greasy animal matter and make it less liable to slip while in use. None of these was recognized among the objects found. A lath-shaped piece of bone of a sea mammal found in heap A may be a flaker. It is about 7 inches long, nearly flat on both sides, rounded off on both edges, and decayed, or broken and decayed at the ends. Some blades, identical with rejects, may have been ready for specialization into various forms by further flaking or merely by notching, or they may have been used as they are. The finished points previously discussed complete the series.

The chipping of points out of metargillite is illustrated by one hundred and seven specimens. One is a pebble; three are chips of pebbles, one of which appears to be from a celt and chipped on the broken surface; two are pieces which, when fresh from the quarry, would have been suitable

raw material; and seven are cores from which pieces had been chipped. Fifteen are large chips of metargillite, and forty-five are large and small chips (Plate III, figures 5 and 6). Nine are chipped pieces; twenty-two, three of which are illustrated on Plate III, figures 7, 8, 12, are rejects; one is a point broken in process of chipping; one is a thick, leaf-shaped point, probably a reject; and one is a point with the butt unfinished.

It is noteworthy that there are only one hundred and seven specimens in process of manufacture from metargillite as compared with one hundred and twenty-two finished products from the same material. This may mean that the prehistoric people quarried the metargillite and partly chipped most of it at or near the quarries; most of the chips and rejects would then remain at the quarries, and chiefly the chips of the finishing process would be left at the sites on the harbour.

The manufacture of points chipped from quartz and quartzite is illustrated by over one hundred and one specimens. Among these are: some white quartzite pebbles, that may have been raw material for points or scrapers; a fragment of a pebble; and a longitudinal sector chipped from a small pebble. Seventy-four specimens are pebbles or chips from such pebbles (Plate III, figure 2) showing one or two battered poles from which the chips were struck (Plate III, figure 3); most of the pebbles were small, but a few were large (Plate III, figure 1) and from them a piece or pieces had been chipped until in many examples more than half of the pebble was gone. The remaining specimens include: eleven chipped pieces (Plate III, figure 4); three small chips; a chip of a light grey quartzite pebble; a chip of clear quartz; three pieces chipped and apparently rejected; a leaf-shaped point or reject chipped from quartzite (Plate III, figure 11); a lozenge-shaped object chipped from quartzite (Plate III, figure 14); a reject chipped from quartz with the base broken off and missing; a fragment of a reject bearing a barb; a thick, coarse reject with the point missing; and a crude, triangular point.

Of finished products of quartz and quartzite there are only: a tanged quartz point (Plate IV, figure 12); two broken, barbed points made of quartz; two tanged points of quartzite (Plate IV, figures 7 and 13), the one in figure 7 with the point shorter than the tang; a butt broken from a notched and barbed point of grey quartzite; and twelve scrapers chipped from white quartzite (Plate XVII, figure 2).

Altogether there are, in addition to some unbroken quartz pebbles, eighty-seven pieces of quartz pebbles, five chips, and nine rejects or crude points; a total of one hundred and one articles in process of manufacture from quartz and quartzite; whereas there are only five specimens of finished points or, counting the twelve scrapers chipped out of white quartzite pebbles discussed on page 62, a total of seventeen finished articles. Thus in the case of quartz and quartzite there are more specimens of materials in process of manufacture than of finished products, which is the converse of the case with respect to metargillite.

Three specimens of chalcedony were found. Two are chips, and the third is a leaf-shaped piece (Plate III, figure 13).

Three specimens of jasper were found. Two are chips of yellow jasper, and may have resulted from making either points or scrapers; the third is a reject in the manufacture of a point. Eight scrapers chipped from jasper were found and are discussed on page 62.

Points Rubbed out of Stone

Points rubbed out of stone were not found on Merigomish harbour. To the south of Milton, Queens county, a few long, one 18 inches long, bayonet-like points made of slate and polished, have been found[1].

A specimen (Cat. No. 3694) in the Provincial Museum is from Shubenacadie river, Hants county, and another of greenish slate, in the same museum, is supposed to have been found in Lunenburg county, as it is in the Des Brisay collection from that place. These are beautifully finished, long, delicate, and fragile. A lanceolate point rubbed out of stone, lenticular in section with a nearly rectangular tang, and supposed to be an artifact of the Beothuk Indians, is in the Provincial Museum (Cat. No. 3394). It was found at La Couché, near the mouth of White bay in northeastern Newfoundland.

Simple Bone Points for Arrows, Harpoons, Etc.

Simple points were usually made of solid strips of the walls of large bones, and are roughly oval in cross-section with a tendency to have slightly wedge-shaped bases (Plate V, figures 10 and 12). Two or three, however, are decidedly lenticular in cross-section. The section of the shaft in some varies somewhat from the type, probably chiefly because of the lack of finish; the object retaining partly the form of the piece of bone from which it was cut. They are $1\frac{3}{8}$ to $6\frac{3}{4}$ inches long, and vary in shape (Plate V, figures 1-13). None seems to be made of antler; only one specimen is of ivory, and it may be a fragment of a harpoon point or an awl instead of being a simple point.

Twenty-seven entire specimens were found in the heaps on the harbour, twenty-five of them in heap A, one in heap D, and one probably in heap B. Thirty points broken from such simple points, thirty-one sections of shafts lacking both ends, and thirty-three basal ends were found in heap A; nine points, twelve shafts, and seven bases in heap D; one shaft in heap L; three points, three shafts, and five wedge-shaped bases in heap M. In all, one hundred and sixty-one specimens were obtained from the excavations on the harbour. According to the catalogue of the Patterson collection, three points made of bone were found in the prehistoric cemetery, and four on the Millar farm.

Only a very few of the fragments considered as basal ends may be point ends and vice versa. A few of these fragments, especially those which were too small to identify easily, may have been parts of objects made for other purposes, such as awls, which are described on page 64, (Plate XVII, figures 3–16). The objects considered to be awls on page 64, (Plate XIX, figures 16, 17) may have been points, the transverse incisions being to facilitate lashing to a shaft or fish-hook. Some of the other objects considered as awls may have been points.

At least some of the point fragments and even the larger base fragments may be broken parts of barbed harpoon points. A semi-cylindrical piece of ivory found in heap A is probably part of the shaft of a simple point, but possibly may be a fragment of a harpoon point or an awl. A simple shaft of much decayed bone was found in heap L. Of the eleven pieces of

[1] Cf. Piers (a), p. 112.

simple points made of bone found in heap M, three are small, three larger specimens are oval in section, two other large points are lath-shaped, and one shows along one edge a bit of the grooving by means of which it was cut out.

The small points, probably, were used for arrows and were inserted in a split shaft and held there by lashings; the large points may have been for bird or fish spears. The smaller points may have been used for barbs lashed to spears, arrows, or fish-hooks, or they may have been used as fish-hooks.

The specimen shown on Plate V, figure 1, best presents the general designs of the smallest of this style of bone point. Figure 2, on the same plate, has a long tang, a gradually enlarging head, and rather blunt point. Figure 4 has a base cut obliquely from edge to edge, probably an accident, but possibly intended as a barb. Figure 5 is delicate, thin, and sharp at both ends. Figure 6 is hollow for some distance from the lower end, which is cut obliquely across the marrow canal of the bone from which it was made. Figure 7 is thin, sharp at both ends, and shows signs of winding on the lower half, in the form of decayed streaks across one side of the point; the streaks were probably caused by decay setting in quicker than elsewhere, between or under lashings of twisted cord that held the point in place. Figure 8, one of four similar specimens from heap A, is sharp at both ends and delicate, but irregular in cross-section, apparently because it retains much of the shape of the piece of bone from which it was made. Figure 9 is nicely oval in section, rather delicate, and sharp at the point. Figure 10, one of five similar specimens from heap A, is typical of the medium-sized, simple points; it is heavy and has a tang narrowed and thinned to a blunt base. Figure 11 is a large, flat, or lath-shaped point with crude base broken across and rubbed slightly on the edge of the broken surface. Figure 12, the most slender of six similar points found in heap A, represents the general design of the longer, simple points; it is oval in section, with long, tapering point, and thins to a blunt base. Figure 13 is practically the same as the last-mentioned point except that it is thicker and wider. A shorter, similar specimen was found in heap D.

One of the fragments of a base from heap A shows the longitudinal grooving on each side, by means of which the piece from which it was made was separated. A long, thick specimen, found in heap A, is chipped away over the whole length of one side, except on a small space near one edge, and over nearly half of the other side. Apparently it had been broken and was being made into something smaller, or was being destroyed.

Special points of bone were also found, ten in heap A and six in heap D. Two entire points and six fragments are mentioned below, and the remaining eight specimens are illustrated on Plate V, figures 14-21. The one shown in figure 14 is 7½ inches long or about ¾ inch longer than the longest simple point. It has a slightly enlarged head tapering gradually into a very long shank. It is of oval cross-section throughout and is not much flattened at the base, if intentionally flattened at all, as the slight chipping on each side of the base does not much reduce its thickness.

The specimen represented by figure 15 is 8¼ inches long, is the longest entire point found on the harbour, but it probably was exceeded in length by the broken harpoon point represented on Plate VI, figure 9. The object, possibly a point, shown on Plate VII, figure 9, is also longer. The

specimen, figure 15, has an enlarged head, but one that is lanceolate with lenticular cross-section. The edge on one side of the head is practically in a straight line with the remaining part of that side of the object, the sharp edge of the head gradually rounding off into the rounded edge of the shaft. On the other side, the sharp part ends abruptly where the shaft expands to meet it. A similar specimen, but cruder and shorter, was found in the same heap.

One fragment of a flat, simple point, with about a third at the tip missing (Plate V, figure 16), narrows but does not thin out much towards the blunt base and has a wide, wave-shaped notch in each edge, near its middle. One notch is deep, the other hardly perceptible. Both show striations caused by grinding across the edge of the object in making them. Another specimen (Plate V, figure 17) is a basal end narrowed and thinned to a blunt end, and has a notch in one edge about three-quarters of an inch from the end. This notch seems to have been a hole, tapering inwards from each opening, which now appears as a notch because of the cutting away of part of the side of the object. The notches in these two points with flattened bases were probably to facilitate fastening them in the split end of a shaft.

One entire, slender, lath-shaped point was found in heap D. Two fragments of points made of hollow bird-bones, and one end of a large bone sliced off at a bevel forming a lance-shaped point—the last possibly not of this class—were also found in the same heap. An end fragment of a very bulky point about five-eighths by three-quarters of an inch in section was also found there.

Five fragments of wide, flat, lance-shaped points, made of bone and lenticular in cross-section, were found, three in heap A (Plate V, figures 18 and 19), and two in heap D.

A point, unique of its kind among finds on the harbour (Plate V, figure 20), is made of part of the wall of a medium-sized bone. It is sharpened to an acute point, but the side edges, unlike those of the points illustrated in Plate V, figures 18 and 19, are dull. The base is broken nearly square across, so that the specimen may possibly be a fragment of some longer object, and not a point. The long, shallow notches in the sides at the base, however, not only give it its unique character, but also make it seem to be a point for an arrow.

Another specimen made of bone (Plate V, figure 21), leaf-shaped in outline and lenticular in cross-section, but with rather rounded side edges, is unique in being bevelled from just below the middle to the base, as if it had been lashed to the end of a foreshaft or had been reversed and lashed on as a barb.

No points made by sharpening the tips of antlers were found on the harbour, though they are common in Maine[1] and beyond to Arkansas.

An object, supposed to be a point for an arrow or harpoon (Plate V, figure 22), is made of a tooth of a shark with the sides of the artificially concaved base cut until this end is almost wedge-shaped and with a notch on each edge, so that it resembles the base of a notched, chipped point for an arrow.

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[1] Cf. Willoughby, pp. 431–437.

Barbed Bone Points

Fourteen barbed harpoon points made of bone and entire, or practically so (Plate VI, figures 1–12), and forty-three fragments, were found in the heaps of the harbour. According to the catalogue of the Patterson collection, two, each with a hole through the tang, were found in the prehistoric cemetery. Patterson (a, page 235, and b, page 30) states that one nearly perfect[1] example was taken from the pit at this cemetery, and, according to the catalogue, two entire barbed points and a fragment of a third were found on the Millar farm. Two found in the heaps seem to be made of antler, but none of ivory. The range of size and shape of those made of bone is shown on Plate VI, figures 1-20, and Plate VII, figures 1, 2.

In Nova Scotia as a whole, harpoon points made of bone are said to be uncommon, as there are not many in the collections in the Provincial Museum and Dalhousie University[2], and some of these are made of ivory similar to points used by the Eskimo. But here again the apparent rarity may be due to methods of collecting rather than to real scarcity.

The harpoon points exclusive of toggle points may be divided into three general classes: those with short barbs on one side made by shallow notches (Plate VI, figures 1-9); those with long barbs on one side made by deep notches (figures 10-14 and 16-20); and those with barbs on both sides (Plate VII, figures 1, 2).

The shafts are flat or convex on both sides with a concavity in the middle of one side, due to the marrow canal in the bone (Plate VI, figures 2-4, 6, 8, 10-12, 17). Their cross-section is like the longitudinal section of an almond (figures 1, 5, 7, 13, 14).

The barbs are of five types: (1) those made by shallow notches on one edge (Plate VI, figure 1); (2) those produced by short, shallow, oblique notches, on each side of the edge (Plate VI, figures 2, 3); (3) those made by combining notches of types (1) and (2) (Plate VI, figures 4-8); (4) those made by notching or cutting away part of a narrow longitudinal ridge on the edge of the harpoon (Plate VI, figure 9); and (5) those made by deep notches cutting away about half of the harpoon shaft (Plate VI, figures 10, 11, 14).

The notches are small in proportion to the barbs in the specimens on Plate VI, figures 1-8, and in nearly all of them the outer edges of the barbs are part of the original edge of the point. In one (figure 9) the parts of the edge between the three groups of barbs, and between each barb of the two lower groups, were removed by long cuts instead of notching. In specimens with holes through the tang (Plate VI, figures 10-12), and in those probably of this class (Plate VI, figures 14 and 18), the notches are about equal in size to the barbs and the barbed edge retains little or none of the original edge of the object.

The tangs of most of the harpoon heads decrease in width and thickness toward the base and are more or less wedge-shaped, as would be desirable to fit them into a socket or the split end of a shaft. The specimen illustrated on Plate VII, figure 11, is a basal fragment of what was prob-

[1] Cf. Dawson (a), p. 19 and Fig. 1 of supplement, and Dawson (b), Fig. 27.
[2] Cf. Piers (a), p. 116.

ably a very large harpoon and shows part of the notch under the lowest barb. It is cut from a very large bone so that the obverse is convex, the reverse nearly flat with the marrow canal in the middle; the front edge is sharp, the back nearly flat. The tang is wedge-shaped, but has no perforation. Near the upper or broken end there are a number of transverse scratches arranged in two or possibly three rows along the highest part of the convex surface of the object. A fragment of a thin harpoon point made of bone, found in heap N, has a wedge-shaped base and a barb in one edge. Judging by the fragment, the point probably had one more barb, or at most not over three, but all in the same edge.

Seventeen of the harpoon points, besides the two in the Patterson collection from the prehistoric cemetery, have a perforation through the tang. All of these are heavy and have notches cutting deeply into the shaft. Several of the heavy and deeply notched harpoons (Plate VI, figures 14, 18), of which only the point end was found, may have had no perforation. Of the perforated harpoons, eight are from heap A, one probably from heap B, five from heap D, two from the prehistoric cemetery, and one from heap L. The specimen illustrated on Plate V, figure 17, among simple points made of bone, is probably one of these harpoon points with the perforation broken out. The perforations are gouged out rather than drilled, and taper inwards from both openings. Except in one case, they are slightly off the middle of the tang, towards the barbed edge. The hole was apparently used for the attachment of a line to retrieve the point when detached by the struggles of the harpooned animal rather than to fasten the point to a shaft. In one specimen (Plate VI, figure 11) the hole is worn down towards the base, but only on the obverse side, and in another (figure 13) it is worn down on both sides. This wearing was probably done by the retrieving cord, which in the former may have been knotted on the reverse side, whereas in the latter it probably was looped or ran free.

The first type of barb, made by shallow notches across one edge, is represented by only seven specimens. Six of these are from heap A and one from heap L (Plate VI, figure 1). The barbs are at intervals of about an eighth of an inch, and are notched in such a way that they are slightly undercut. In cross-section the shafts are crudely circular or oval except for the sharp edge, which gives them an almond-shaped cross-section. Three of these harpoons were made of solid pieces of the wall of a large bone, and one (Plate VI, figure 1) is made of a bone that has been only slightly shaped from its natural form. Two fragmentary specimens from heap A appear to have this type of barb. One of these is a tip, almond-shaped in cross-section; the other, which lacks both ends, is concave on one side where it was grooved in cutting it out, and has the barbed edge sharp and the other edge rounded. The specimen found in heap L (Plate VI, figure 1) is a tip, thin and oval in section, but slightly sharper on the barbed edge than on the back. The notches are cut into the edge at an angle. Four fragments found in heap A are of harpoon heads barbed by merely making one V-shaped notch square across a sharp edge.

The second type of barb, made by a shallow notch on each side of the edge, is found on seven specimens. Six of them are from heap A and one from heap D. One specimen (Plate VI, figure 2) has only one barb, and has a much larger head than tang. It was made from a piece

of the wall of a large bone with a narrow canal so that, though generally oval in section, it has a groove in the middle of one side. Another, more delicate specimen (Plate VI, figure 3), found in the same heap, was made of a piece of the wall of a small bone and has four barbs. It appears to have been a longer object that was broken obliquely and repointed, since a large part of the broken surface, showing on the reverse, has not been smoothed and the point is not as symmetrical as usual. The remaining four specimens found in heap A are basal ends of harpoons. One is sharp, like a point, and is almond-shaped in cross-section, with two barbs that point down at about 45 degrees and are well undercut; another is more wedge-shaped than pointed, although almond-shaped in section; the third has a wedge-shaped base and shows traces of the marrow canal; the fourth is large with narrowed, wedge-shaped base. The specimen found in heap D lacks both ends; its barbed edge is sharp, and its back is rounded.

The third type of barb is a combination of the first and second types of barbs (Plate VI, figures 4-8) and is seen on twelve specimens; eight of them being from heap A, one probably from heap B, two from the prehistoric cemetery, and one from heap M.

One specimen (figure 5) is almond-shaped in cross-section and made of a thick, strong piece of bone. A point from the same heap has seven barbs cut into the sharp edge of a piece of the wall of a small long-bone that is rounded on the back edge (figure 6). The tang was narrowed, probably for insertion in a socket or in the split end of a shaft.

It may be considered an intermediate form, the barbs of the fifth type being an enlargement and development of this type of barb. This point is made of a longitudinal piece of metapodial bone, apparently of a deer, cut out by grooving and breaking. The large and bulging joint end of the bone remains and, therefore, the point is not suited for insertion in a socket or the split end of a shaft; possibly it was left unfinished, since all other harpoon points and simple points have narrowed or wedge-shaped tangs.

One specimen (figure 7) with six barbs very slightly notched on the two sides, has an unusually blunt point in comparsion with the long, slender tang, as if it had been broken off and repointed. It is made of heavy bone and in cross-section is crudely almond-shaped.

One harpoon point (figure 8) has four barbs. It is made of a section of a thick, large bone, rounded at the back edge and sharp on the front edge, so that it has an almond-shaped cross-section. A part of the marrow canal shows in the middle of the reverse. The base has not been evenly trimmed but apparently still follows the original shape of the piece of bone. The tip has been removed by incising and breaking, possibly because it had been broken. This incising shows more on the reverse than on the obverse. The specimen is unique among those from the harbour in being decorated, as mentioned under decorative art on page 85, with three parallel longitudinal grooves, each bearing short, diagonal grooves so as to resemble impressions made by a twisted cord.

One very heavy tip of a harpoon point, with two notches, was found in heap A. It is made of a thick bone and is nearly flat on one side, the other showing two convex surfaces meeting in a medium ridge. Three more

fragments of harpoon points were found in the same heap. One of them has a roughly almond-shaped cross-section and was whittled to a slender, acute point. The opposite end has been incised across to facilitate breaking, or perhaps, to smooth the broken surface. A point, probably from heap B, has four barbs, and shows the marrow canal on one side, being made of a strip cut from a large bone. The lower end is broken off, but is the widest part of the object. A specimen of a tip (figure 15) broken from a very bluntly pointed harpoon head was probably dulled or broken off by use or accident.

The fourth type of barb, made by notching a longitudinal ridge on the shaft or by removing parts of the edge between the barbs by long cuts, is seen on seven specimens. Three of them are from heap A, three from the prehistoric cemetery, and one from heap M. A long, slender harpoon point without tip, seen on Plate VI, figure 9, has barbs of this type. It is now 7½ inches long and, judging by its general outline, must have been at least 9 inches long. It is the longest point found on the harbour. There are three barbs at the base of the head, two near the middle, and two, one of them very slight, near the base. It resembles in a general way the special simple point made of bone, from the same heap, illustrated on Plate V, figure 15. Both have an enlarged lanceolate head with lenticular cross-section. The widest part of the shaft is oval and the lower part is nearly circular in cross-section, and tapers gradually to the base, the tip of which is missing. On one side the sharp edge of the head ends abruptly where the shaft expands to meet it. On the other side the sharp edge apparently extended to the base and by cutting way parts of it the barbs were left projecting. The undercut of each barb is slight. The three upper barbs are so close together that the cut edge, or the outer edge of the barbs, reaches from the tip of one barb to the base of the other. The shaft has been broken in two just below the upper group of barbs and the two parts subjected to different conditions. A red stained spiral band may be seen from the break to near the base. Apparently the base fitted into a socket which kept it from being stained. If the top piece was stained, the stain has disappeared, but possibly the staining was applied only to the lower part after the shaft was broken. This colouring is further discussed on page 83.

A basal fragment of a harpoon head found in heap A is circular in cross-section and tapers to the base. It has a narrow, longitudinal ridge showing the grooving on each side by means of which it was formed. This ridge is notched, thus producing barbs like saw teeth and with no undercut. Another specimen from the same heap is a part of a shaft in cross-section, with one longitudinal ridge-like projection, possibly a barb, which at one end rises suddenly at right angles to the shaft, and at the other end slopes to the shaft. There are two shallow transverse notches above the barb. A specimen from heap M is a section of a cylindrical shaft with a longitudinal ridge produced by a groove on each side. On this ridge a barb has been made by a cross notch. The longitudinal ridge on either side of the grooves that produced the barbed ridge has been partly cut away, but much farther below the notch than above it.

A long, basal fragment of a harpoon point made of ivory with a notched ridge on one side, is catalogued under No. 203 in the Patterson collection as from a mussel bed in the harbour. It is 4⅜ inches long by about 3⅜ inches

in diameter and the base is conical. The barbs on two fragments of harpoon points with barbs on both edges (Plate VII, figures 1, 2) are also of the fourth type.

The fifth type of barb comprises those in which notches, from a third to a half as deep as the width of the harpoon head, are cut far into the shaft. This type is seen on eight specimens and fifteen others probably had it. Three are entire specimens, with a hole through the tang; five are mere fragments of harpoon heads; eight are fragments which probably had a hole through the tang; and seven are fragments which have a hole through the tang and probably had barbs of this type. This type of barb occurs on most of the large harpoon points, entire specimens of which have a hole through the tang (Plate VI, figures 10, 11), and appears on the tip of a harpoon point (Plate VI, figure 14) which also probably had a hole through the tang. It may be considered as an enlargement and modification of the third type, which has a notch on each side and one across the edge, but in that type the notch is a small feature on the shaft. The outer or long edge of the barb is usually rounded, from the tip to the base of the next barb above, or to the tip of the harpoon head, if it be the tip barb. This rounding obscures the signs of a notch under the barbs. The grooves extending beyond the axil of the barbs show only slightly if at all. The barbs on the harpoon head shown on Plate VI, figure 4, if they had been deeper in proportion to the width of the specimen, might be considered to belong to this type rather than to type three, or to be an intermediate form, as the outer edge of each barb is cut in from the tip of the barb back to the base of the next barb.

One specimen (Plate VI, figure 10) has two barbs and shows the marrow canal of the thick, large bone from which it was cut. The obverse is ridged, which gives the harpoon head a somewhat triangular cross-section. The tips of the barbs and the edge of the widest part of the tang seem to represent the original outline of the bone. The hole through the wedge-shaped tang is close to the barbed edge and is gouged out, tapering inwards from both openings. Another specimen (Plate VI, figure 11) is made of a rather flat bone and has two widely separated barbs. The tang is not wedge-shaped, but the whole object is thin. The perforation through the tang is in the widest part close to the barbed edge. On the obverse side the hole is worn down towards the back of the harpoon head, as if from the wear of a cord fastened on the other side by a knot.

Another harpoon point (Plate VI, figure 12) is made of the wall of a bone and has six barbs. The tips of three of the barbs are broken, but the others each retain a part of the original outline of the bone blank from which the point is derived, as is the case on some of the specimens having barbs of type three, and on all of those having barbs of types one and two. The tang narrows nearly to a point and is slightly wedge-shaped. The hole through its widest part, nearer the barbed edge than the back, was gouged out and tapers inwards from both openings.

A point found in heap A had at least two barbs, apparently of the fifth type, but they are lacking. It is made of a piece of the wall of a long bone, and is, consequently, convex on one side and shows the marrow canal on the other. The tang narrows to an end cut straight across and is slightly wedge-shaped. The hole through the widest part and near the barbed edge is gouged and tapers inwards from both openings.

Two fragments of flattish shafts, one of them apparently made of a bone of a sea mammal, each bearing one barb of this type, were found in heap D; a similar fragment was found in heap A. Four other fragments of harpoon heads having barbs of this style and a hole through the tang were found, three of them in heap A and one in heap L. All are flat with rounded backs and wedge-shaped tangs. Each has a hole gouged through the widest part of the tang near the barbed edge. Two of those from heap A show only one barb, but one of them is large and apparently had about four barbs. A third which is burned has two barbs and probably had at least one more. The specimen from heap L certainly had two barbs, and probably had four. One large specimen from heap A shows the marrow canal on one side, and the base does not narrow or thin much. It had one barb, but the notch below it is so small that the tang does not seem to be an enlarged part of the shaft, and begins to taper far above the line hole. This hole is nearer the back than the barbed edge, was gouged, and tapers from each end as usual. Another from this heap is small, oval in section, had at least one barb, and is perforated as usual near the front edge of the tang, which tapers to a wedge-shaped base. A specimen found in heap D also had at least one barb from which the tang expands. The hole is through the widest part of the tang near the front edge, is gouged out, and tapers from each end. There are two incisions across one side of the tang below the hole and three across the other side. Two fragments of tangs show perforations of the usual kind. In one, a trough-shaped piece of bone rounded to a point, the hole is near the front edge. The other specimen is broken, so that it is impossible to determine the relative position of the line hole.

A large tang (Plate VI, figure 13) is oval in section and had at least one barb, besides probably three or four on the missing end. It is slightly thinner at the barbed edge than at the back and has a peculiar, upturned projection or hook at the lower end of the notch under the barb. This tang is very long and tapers gradually. The hole through it is near the tip instead of at the widest part, and is nearer the front edge than the back. It is worn at the lower end on both sides as if by a loop running through it. A tip of a harpoon (figure 14) had at least three barbs. It is oval in section and apparently made of part of a bone of a sea mammal.

Another specimen (figure 16) has a knob at the end and one barb, and probably had three or four barbs when whole. Possibly it was used as one of the two outside prongs of a three-pronged fish-spear, and the knob may then have been intentional. On the other hand, the extreme tip and the first barb may have been accidentally broken off and the scars rounded, or it may be an unfinished pointed harpoon head, the barb shown being the first barb and the knob an unremoved part of the bone.

The fragment of a large harpoon point made of antler (figure 17) has been so burned that it has a metallic ring. There is only one barb on this fragment, but the shape of the shaft, roughly triangular in section with sharp barbed edge, suggests that the harpoon head was barbed only on one edge. This edge of the barb does not project beyond the general outline of the object; in this respect differing from the type in figure 20. The notch under the barb was cut from both sides and the axil is rounded, as in those shown in figures 11, 18, and 20. This specimen is decorated, as described on page 85, by a longitudinal row of pits extending on the

back edge over half its length and replaced by a groove for the remainder of the distance. The obverse is the smoother surface, being the outer side of the antler. On this side is a row of pits closely bounding both the front edge and the notch under the barb. Another row parallels the back edge, but not so closely.

Two fragments of thin, flat harpoon points, made of antler, each barbed on one edge and having small notches across that edge, were found in the same refuse. The barbs are similar to that on the specimen above described. On the back edge of the larger of these fragments there is a row of shallow pits, apparently made for decorative purposes.

The two barbs on the tip fragment of a harpoon head (Plate VI, figure 18) are somewhat specialized from this type. The shaft is oval, almost lenticular in cross-section. The axils of the barbs are somewhat square, as in the points illustrated in figures 11, 17, and 20, but the long edge of the barb, as so seen in the illustration, is distinctly shouldered. That portion of the edge from the shoulder to the axil of the barb is more or less flattened. A similarly barbed tip fragment of a harpoon with three barbs was found in the same heap. A third harpoon head with this specialized style of barb is illustrated in figure 20.

A well-made barb of the fifth type (Plate VI, figure 19) cut from a harpoon made of bone, is cut off flat parallel to the median line of the shaft. This flat surface shows striations such as might be made in cutting it off with a flake of stone. The barb may have been cut off to reshape a harpoon head, but its use is only conjectural.

The specimen in figure 20, of bone, is roughly triangular in section and has been burned, so that it has a metallic ring. On its more acute angle it has one barb of the specialized form of the fifth type. Above it is the undercut of another barb, probably the tip one. The triangular shaft, sharp edge, and these notches, suggest that it was barbed only on one edge. The barbs apparently vary from those of the fifth type in having the outer edge in line with the general outline of the object. The two barb undercuts on the fragment were clearly cut from both sides. In general they are like the notches illustrated on Plate VI, figures 17 and 18, but are larger at the bottom of the cut than at the opening. Below both notches the edge of the shaft was cut away for a distance greater than the depth of the notch or the length of the barb, apparently to allow the barb to take effect, and was necessary because of the narrowness of the notch at the opening. As described in detail on page 84, this specimen is decorated with notches along the edges. A longitudinal incision extends along all but the upper part of the back edge. On each of the sides near the back are two parallel grooves. The second groove falls farther short of the tip than the first, especially on one side. Across the angles of the back, between the incision on the back and those on the sides, are notches which are very slightly slanted. All the front edge of the harpoon head bears notches and there are also notches on both corners of the undercut below the barb. A specimen found by Patterson[1] in the prehistoric cemetery closely resembles this one.

Three or possibly four harpoon points, barbed on both edges, are known from the harbour, all being from the prehistoric cemetery. Two of them are small and delicate, and have minute barbs like saw teeth at

[1] Cf. Dawson (a), Fig. 1 of supplement, and Dawson (b), Fig. 27.

intervals of about a thirty-second of an inch (Plate VII, figures 1, 2), whereas the third (in the Patterson collection, Cat. No. 212) has deep notches forming large barbs. Both the fragments of points found are of bone, are lanceolate with lenticular cross-section, have both ends missing, and have been burned. Both edges have many minute barbs of the fourth type, that is, made by notching a ridge. The ridges are formed by small grooves on each side. In one (figure 2) the barbs are on the lower part only. The specimen in the Patterson collection consists of several fragments of bone, the tip and part of one edge being missing; but it shows that it had two barbs on one edge and one opposite the upper barb on the other edge. It is $3\frac{5}{8}$ inches long by $\frac{9}{16}$ wide and $\frac{3}{8}$ thick. As the edges are bilaterally symmetrical wherever complete, it seems that the barbs were in pairs and, judging by the proportions of the object, there was probably a third pair of barbs at the tip; but, as it was thin, it was probably not provided with a slit for the reception of a stone point. There is a line hole through the base, but, as on the perforated unilaterally barbed heads, this hole is not in the middle.

Toggle points for harpoons are rare on the harbour. Only two are known, both found in heap O and now in the Patterson collection. The first (Plate XX, figure 1) is made of bone and has a slit in the upper end for the reception of a point, probably one chipped from stone. There is a hollow in the base for the reception of the end of a shaft or foreshaft. The barb remains on one side, but appears to be broken off on the other. There is a transverse lenticular hole from side to side through the middle, and the sides from the hole to the base have been slightly hollowed. Apparently the hole and the groove on each side were for a line to hold the toggle point to the shaft or foreshaft. It is $3\frac{5}{16}$ inches long by $1\frac{1}{16}$ wide and $\frac{9}{16}$ thick. The second (figure 2) is made of ivory. There is a deep pit in the base, rather too deep to allow it to toggle easily. The hole for the toggle line was larger than in the other point. This point was broken across the hole and the upper part is misisng. It is $1\frac{7}{8}$ inches long by $1\frac{1}{16}$ wide and about $\frac{1}{2}$ inch thick.

Points Made of Copper. Simple points made of copper, like the two found (Plate VII, figures 3, 4), may have been used on arrows, as barbs to fish-spears or fish-hooks, or as awls. Bone points of similar size and shape, lashed to modern shafts, have recently been used as fish-hooks by the Montagnais of lake St. John, Quebec (Plate XXI, figure 2). The first of the copper points is roughly four-sided, with rounded corners, but runs out to a conical point. The base is divided for three-eighths of an inch, which suggests that the point may have been a needle with the basal end of the eye split open, but as there is a crack near the point in the same plane with this split the latter seems more likely to be merely an opened seam in the copper. The second is also four-sided and nearly twice as wide as thick, but the corners are not rounded, and the point, formed by bevelling from the side edges, is rough. At the lower end it is bent over and split flatwise. Near the middle and at the point the seam of this split also shows. The object seems to be a piece of copper for use as material or an unfinished artifact rather than a point, barb, needle, or awl.

In other parts of Nova Scotia seven specimens have been found. Six of these, found at Backman beach, Lunenburg county, are described as

awls, on page 65, but may have been points. They are pointed at both ends, square in cross-section, from ¾ inch to 1½ inches long, and are Cat. No. 75 in the Provincial Museum, Halifax. Another, pointed at both ends and square in cross-section, was collected from a shell-heap at cape d'Or by Mr. C. H. Mills.

Fish-spears. The simple points made of bone, described as arrow points, the harpoon heads made of bone, and in fact some of the points chipped from stone, may have been used for fish-spears. The modern Micmacs use a simple conoid point made of wood as the middle prong of their eel spears (Plate XXI, figure 1).

Fish-hooks. Some of the bone objects considered as simple points and as awls, among them especially the smaller sharpened pieces and one or both of the copper objects described on page 34 (Plate VII, figures 3, 4), may have been used as fish-hooks or as barbs for hooks. The Nova Scotia Indians are said to have taken ocean fish with a bone hook.[1] Similar points lashed to a wooden shaft are used for hooks by the Montagnais Indians of lake St. John, Quebec (Plate XXI, figure 2). Possibly, but not probably, the little objects described on page 67 (Plate VII, figures 5-8) were used for artificial baits.

Nets. Fish were, probably, caught in nets, but there are no impressions of netting on fragments of pottery. No objects recognized as mesh measures were found; but if the prehistoric people, like the modern Micmacs, used wooden mesh measures, they would not be preserved in the shell-heaps. Pebbles notched or grooved on two edges and without battered ends, which might be considered net sinkers, were not found on the harbour.

GATHERING PLANT FOOD

No evidence was found of tools for gathering wild plant food or for planting or cultivating. If such tools had usually been made of wood, as is probable, traces of them would rarely or never be found under the climatic conditions of this region. That such tools were not made by the Micmacs in early days is corroborated by the facts, mentioned on page 17, that tobacco was not planted by them in Nova Scotia[2], and that planting of any kind was not done east or north of Kennebec river, Maine, after they could get biscuits from the French.

IMPLEMENTS USED IN THE PREPARATION OF FOOD

Some indications of the methods of preparation of food are afforded by the points chipped from stone—possibly used as knives—the evidence of processes of cooking, the fragments of pottery, and the sharpened objects made of bone, possibly used as forks, all of which were found in the shell-heaps on the harbour. No pestles, mortars, or strainers made of pottery were discovered. According to the catalogue of the Patterson collection, a piece of iron pyrites, probably for striking fire, was found on the Millar farm.

[1] Cf. Gilpin, p. 321.
[2] Gilpin, p. 222.

Knives. Suitably mounted points chipped from stone (Plate III, figures 9-15) may have been used as knives for cutting up meat and for similar purposes. Semilunar knives were not found, but, according to Cat. No. 276 in the Patterson collection, one made of veined, yellowish grey slate was found near cross roads, St. Mary, Guysborough county.

Pestles and Mortars. No pestles or mortars were identified among the finds, although possibly some of the objects considered as hammer-stones, on page 51, may have been used as pestles, and some of the five large specimens considered as whetstones, on page 53, may have served as mortars. The specimen, Cat. No. 72 in the Patterson collection, called a pestle and referred to by Patterson (a, page 247) as grooved for use with a spring pole, is, according to W. J. Wintemberg, only a water-worn pebble and bears no signs of battering or wear. Pestles are found in southern New England.

Cooking. Meat was, probably, roasted before open fires. Charcoal and ashes were frequently found in the shell-heaps. There must have been another method of preparing meat, as is indicated by the great number of potsherds found, most of which seem to be parts of broken cooking dishes rather than of water or ceremonial jars. A few of these fragments of pottery have carbonaceous matter, probably burned food, on the inner surface (Plate VIII, figure 4), and a few have it even on the edge of the rim and on the outside. This suggests that boiling was done in pottery vessels. Stones, cracked and covered with soot, were found in excavating in the shell-heaps and are probably the stones used as pot props. These fire-cracked stones, however, appearing like stones that have been heated and dropped in water, remind us that boiling may have been done in pottery vessels or even in baskets, birch-bark dishes, or boxes, by adding hot stones. Lescarbot once saw an Indian boil meat in a trough formed of a tree-trunk into which he placed red-hot stones, and Piers states (a, page 103) that they also cooked thus in birch-bark receptacles. Some of the fire-cracked stones may be the result of baking roots or vegetables by covering with leaves and building a fire on top of them.

Forks. Some of the objects considered as awls, on pages 63 and 64, may have served as forks. Mills (a, page 47) also considers that the so-called awls made of the tarsometatarsus of the wild turkey, so common in Ohio and Kentucky, and the large awl-like objects made of bone found in the Gartner village site of Ohio served for forks as well as awls. The modern Montagnais Indians make a fork, which they use for punching meat while it is being smoked, by binding together four sharpened splint bones of the moose exactly like the twenty-three similar bones classified as awls, one of which is seen on Plate XVII, figure 15. One of these modern Montagnais forks is illustrated on Plate XXI, figure 3.

Pottery. Fragments of pottery were found in each of the shell-heaps in which excavations were made and apparently in proportion to the extent of the excavations. Five hundred and sixty-five were found in heap A, six hundred and three in heap D, twenty in the refuse of the prehistoric cemetery, four in heap K, sixteen in heap L, one hundred and two in heap M, and twenty-one in heap N. Fragments of pottery in the Patterson

collection are catalogued as from the prehistoric cemetery and the Millar farm. One thousand three hundred and thirty-one fragments were found on the harbour, exclusive of those found by others.

Of the six hundred and three fragments found in heap D, two hundred and seventy-one evidently belong to one pot, one hundred and twenty-five to another, and two to a third. An examination of all the pottery collected allows of an estimate being made that about sixty pots are represented by the fragments from heap A, sixteen from heap D, eight from the prehistoric cemetery, two from heap K, seven from heap L, eleven from heap M, and six from heap N, or a total of one hundred and ten from the harbour.

The pottery from all these places, including the prehistoric cemetery, is of the same general character. It is a coarse, heavy ware. Most of it is brownish grey, but many pieces are buff, salmon, or red, depending on the character of the clay used for coating one or both surfaces. The coating is usually thicker on the outside. It is not a true slip, but a layer on the incompletely fired and, consequently, blackish part of the interior of the body. One large pot, of which one hundred and twenty-five fragments were found, is of unusually bright brick red colour, but yellowish brown on the inside. One of these fragments is illustrated on Plate X, figure 1, another fragment of the same colour is seen on Plate XI, figure 3. The fragment illustrated on Plate VIII, figure 1, has a yellowish coating of this character on both the outer and inner side.

The quality of the ware varies from that with a very rough surface to some of slightly rough finish, but, as might be expected, none is glazed or even highly polished. The fragment illustrated on Plate VIII, figure 8, is as strong, smooth, and highly polished as any found on the harbour, and it is as highly polished as any Iroquoian ware.

The thickness of the ware may be judged from the two larger lots, making over a thousand fragments from the two larger excavations, one in heap A, and the other in heap D. This varies from extremely thin ware, slightly less than three-sixteenths of an inch thick, to ware that is five-eighths of an inch thick, but most of it, as may be seen in the figures, is from five-sixteenths to six-sixteenths of an inch thick. One fragment of a rim (Plate X, figure 12), however, has a thickness of three-fourths of an inch.

The size, and to a certain extent the shape, of the vessels may be judged from the fragments. The thickness of the ware suggests, and the curve of the fragments, especially of the rims, shows that some of the pots were as large as 20 inches in diameter, whereas others were only 3. Most of them probably were about 9 to 12 inches in diameter and depth.

The bottoms were, apparently, usually rounded, but in some cases conical and obtusely pointed. Three pieces found in heap A, two of which are shown on Plate VIII, figures 1 and 2, and two found in heap D, might be considered as possibly from pots with obtusely pointed legs, but are probably from pots that were themselves obtusely pointed, in fact, almost brought to a nipple, like the end of a lemon, at the bottom. A fourth piece from heap A, illustrated in figure 3, seems more likely to be a fragment of a handle than the basal tip of a pot. No doubt many of the broken pieces were of similar shape. The thickness of the pottery at this point, and the fact that these pieces are parts of the ware rather than nipples

on it, are clearly shown in the largest piece (figure 1), in another from heap A, and in one of the two from heap D. Though this does not prove, it strongly suggests, that these are pot bottoms rather than hollow legs, which are unknown in the region. This is corroborated by Patterson (a, page 252) who states that one piece in his collection shows that the bottom of the pot had been prolonged to a blunt point. Besides this, Piers (a, page 117) states that the pottery found at various places in Nova Scotia shows evidence that at least some of the pots were obtusely pointed at the bottom. Such pointed bottoms are found along the coast as far south as North Carolina on the Atlantic coast. Dixon (page 6) states that, as one goes eastward from the region of the Maine-New Hampshire boundary, the form of the base changes and becomes rounded rather than conical.

Handles or lugs were not found, unless the broken projection on the fragment of pottery mentioned above, on page 37, and illustrated in figure 3, is part of one, but Patterson (a, page 252) states that some pieces in his collection have ears, showing that they were suspended over the fire. Dixon (page 6) states that in the Maritime Provinces some form of lug or ear is not uncommon, but that it is either rare or lacking in southern New England. No fragments show punched or drilled perforations. One (Plate IX, figure 5) has a hole gouged in it; but the hole does not seem to have been made in the pottery to assist in suspending the pot or in lashing a cracked part together.

The rims of the pots were all practically straight or without much flare, although Dixon (page 6) states that, as one goes eastward from the region of the Maine–New Hampshire boundary, the prevalence of an outcurved lip becomes more notable. Ninety fragments of rims were found (Plate VIII, figure 11, Plate IX, figures 1-3, Plate X, figures 2-5, 7, 8, 11-16, 22, 26, and Plate XI, figures 1-4, 7, 10, 11, 15). Of five hundred and sixty-five fragments of pottery found in heap A, forty-one were fragments of rims, and of these thirty-seven, or over 90 per cent, were almost straight, whereas only four, or less than 10 per cent, have such a slight flare as to be practically straight. Of the thirty-five fragments of rims found in heap D, all were almost straight. These represent only sixteen pots, as in one case, for instance, eleven pieces are of one pot. Of four pieces found in heap K, one is a fragment of a straight rim; of sixteen found in heap L, one is of a nearly straight rim; of one hundred and two found in heap M, twelve are of straight rims; and of twenty pieces found in heap N, one is of a straight rim. The edge of the rim in some cases is flat (Plate IX, figure 2, and Plate X, figures 2, 7), and the rims of some are scalloped or waved (Plate X, figures 12, 13, 16).

Decoration may be seen on many of the fragments; for instance, out of five hundred and sixty-five fragments from heap A, two hundred and sixty-seven, or over 47 per cent, are decorated; and out of six hundred and three fragments from heap D, two hundred and thirty-three, or over 38 per cent, are decorated. As one hundred and eight of the decorated fragments from heap D belong to one pot, fifty-eight to another, two to a third, and sixty-five are unassignable pieces, there are not over sixty-eight decorated pots indicated by our evidence and perhaps a much smaller number, though more than four. There are too many decorated pieces,

however, to make up only a few pots; and piecing together the rims in some cases shows that whole rims may be nearly restored without using up all the decorated pieces. Examination of the decorated fragments shows pieces of various curves, thicknesses, and kinds of ware, rims of different kinds, and fragments bearing totally different decorations, which strongly suggests that they are of many different dishes. Some pots may not have been decorated at all, since some bottoms (Plate VIII, figures 1 and 2) and rims (Plate IX, figures 1, 2) were not decorated; besides, some decorated fragments have a plain part as large as any undecorated fragment found (Plate IX, figure 4). This would account for the fragments without decoration. Decoration extends to the upper part of the interior of some of the pots (Plate X, figures 14-16). Apparently the rims, necks, and upper parts were decorated and the lower parts plain. There is evidence that about twelve pots had undecorated rims, whereas about fifty-two had decorated rims. That is, between 80 and 90 per cent of the pots had decorated rims.

The ware was ornamented with impressed lines, rows and zigzags of small squarish dots or triangles made with a straight or rocking stamp, parallel rows and curves of nearly transverse impressions of twisted cord; and three fragments show impressions of fabric. Dixon (page 6) states that, as one goes eastward from the region of the Maine-New Hampshire boundary, cord and textile impressions tend to disappear, and stamped designs become more common. Many fragments bearing cord impressions were found and about as many of stamped or roulette work. The method of producing these impressions is discussed on pages 42 and 43.

The use to which the pots were put is only conjectural. Birch-bark dishes or pots may have been used for holding water and maple sap. The pots were probably chiefly used for boiling food. Some of the pieces are caked with carbonaceous matter on the inner surface (Plate VIII, figure 4, and Plate XI, figures 6 and 11). A few (Plate X, figure 7) are caked on the edge of the rim and on the outside, as if food had run over and scorched. Charred material may also be seen on the fragments illustrated on Plate XI, figures 2, 6, 7, 11.

In general the ware is thick, crude, and friable, some of it very friable. It was made into few shapes, generally large pots, 9 to 12 inches in diameter and depth. The necks were not greatly constricted, and the rims were carelessly tapered to a rounded edge, squared, or slightly lipped, and seldom thickened. The ware was marked with designs and was fired at a low temperature. The decoration is all elementary, made up of simple combinations of straight lines and dots without life forms and is discussed more at length on page 42. It is all Atlantic Algonkian ware, that is, of the middle and northern Atlantic slope pottery group, and of the poorer type[1] which belongs to the archaic simple northern division of the art, rather than to the more highly developed southern pottery.

Pottery has been found at various places in Nova Scotia,[2] notably in refuse below high tide at the head of Chester basin, in the Eisenhauer shell-heap near Mahone bay, and near Cooks falls on Lahave river in Lunenburg county. There are about twenty-four fragments of pottery from

[1] Cf. Holmes, pp. 21, 145, and 183, and Pl. IV.
[2] Cf. Piers (a), p. 117.

Nova Scotia in the Peabody Museum of Harvard University. Some of them resemble some of those found on Merigomish harbour. The Micmac Indians probably ceased to make pottery when it became possible to secure kettles from the French.[1]

Manufacture of Pottery. The method of manufacture of pottery is partly illustrated by the specimens found. The clay was, probably, obtained in the neighbourhood. The peculiar feature of the body of the pottery is the large amount of antiplastic material or grog with which the clay was loaded. A modern potter would find it extremely difficult to mould a material containing so little clay substance and so much coarse grog. The grog consisted of coarse sand, crushed rotten rock, or crushed shells. Its object was to prevent shrinkage and cracking in drying and burning. The sand and fragments of stone were used freely; a mixture of about equal parts of clay and crushed stone or coarse sand often composes the body, as may be seen in the fragment (Plate VIII, figure 5), from which the outer surface is broken. The clay in about two hundred fragments, or 20 per cent of the whole, was tempered with stone, and in only three fragments with a mixture of stone and shell. Fragments of shell were also used in the ware of about nine hundred fragments, or about 80 per cent (Plate VIII, figures 6, 7, 9, 11). The lower part of the outer surface of the fragments shown in figures 6 and 7 has been broken off, so that the shell-tempering material of the interior shows clearly. There seems to be no tempering material in about ten fragments, or about 1 per cent. The fragments of shell have dissolved and left only the mould in the surface of the ware in five lots of fragments found in heap D and in two lots found in heap A, making a total of seven lots or nearly two hundred fragments (Plate XI, figure 7).

The pots in some cases may have been modelled to form from a mass of clay without the use of the coiling or banding method. However, about three hundred out of one thousand three hundred and thirty-one fragments show a welding line; and these fragments represent about seventy of the one hundred and ten pots indicated by the finds. Thus nearly 70 per cent of the pots were certainly formed by coiling or by building band on band. The fragments break most easily along the lines where the coil or band was welded (Plate IX, figure 4). These breaks, determined by their parallelism with the rim, or the encircling decoration, or with the hollow of the neck, are horizontal or nearly so, the pottery breaking somewhat smoothly along horizontal lines, and jaggedly in all other directions, as shown on Plate VIII, figure 10, where the top and bottom are straight and the ends irregular. A line of welding crosses the fragment illustrated on Plate VIII, figure 5, and a break along a welded surface extends from the lump in the middle of the upper edge to the left corner. Another welded line crosses the fragment near the bottom. This feature comes out clearly in the three fragments of a single pot (figure 11). The fragment illustrated on Plate XI, figure 13, shows, on the inside surface, a part of the coil. Had the clay been put on in patches, we should expect to find some pieces broken smoothly along vertical lines of welding. If the patches were twice as long as wide, at least half of the lines of welding found should be vertical. If in long bands or coils, the

[1] Cf. Gilpin, p. 222.

frequency of vertical or splice weldings would be less in proportion to the length of the pieces spliced. There must have been some such weldings, but none has been noted, and, consequently, it is difficult to determine if the walls of the vessels were built up by spiral coils or if patches were used. It is possible, but not probable, that bands rather than coils were used. In most determinable cases the clay of the upper added band or coil was plastered down over the rounded upper edge of the lower or previously laid part of the pot, and usually extends farther down on the outside than on the inside of the pot; but on the fragment illustrated (Plate VIII, figure 5) the welded surface slopes farther down on the inside. The breaks along or parallel with the upper edge of a fragment are, consequently, mostly convex, whereas those along or parallel with the lower edge are concave (figures 10 and 11). The width of the coils or bands varied (Plate VIII, figures 5, 10, 11). To form the rim, the upper edge of the vessel was sometimes folded over, as shown in the cross-section of the fragment of several pot rims (Plate XI, figure 2).

After the pot was shaped, it was coated both inside and outside with a thin layer of clay containing very little sand. This coating is what potters call slip, but was probably smeared on by hand, the ware not being dipped in a clay solution after the manner of applying a true slip. The coating served a twofold purpose; it gave a smooth surface for the application of decoration, and it produced a fairly impervious skin over the very porous body when the ware was burned, but none of the pottery was glazed. The pot was probably allowed to dry and stiffen before the finishing layer of fine clay was applied, so as to allow for the difference in shrinkage between the body and the finishing coat.

Scarification made before the ware was fired shows clearly on the inside surface of some of the fragments. Of the six hundred and three fragments of pottery found in heap D, scarification shows on the inner surface of nearly all of a lot of one hundred and twenty-five—apparently all from one pot—one of which is illustrated on Plate VIII, figure 12. It also shows on one fragment in a lot of two hundred and seventy-one—apparently all from one pot—and on fifty-six out of about two hundred fragments of various pots. Two pieces of another pot show no scarification. Fragments that are scarified on the inside are illustrated on Plate VIII, figure 9, Plate X, figure 9, and Plate XI, figures 1, 2, 3, 7-9, 11, 12. It is impossible to say whether a few pots were scarified on the inside or whether all were so treated. Some of the scarification on the inside of the fragment illustrated on Plate XI, figure 3, runs around inside the rim in a band about an inch wide, and from this band others, slightly curved, extend down nearly at right angles. Scarification made before the ware was fired appears on the outer surface of fourteen out of nineteen fragments of a lot, apparently of one pot, found in heap A. One of these is illustrated on Plate VIII, figure 13. Altogether about 20 per cent of the fragments from heap A are scarified on the inside surface and about 3 per cent on both the inside and outside surface. This scarification was probably caused by the use of a rough pottery polisher rather than for decorative purposes, as it does not form patterns, and is found more on the inside, where it would be more difficult to remove than on the outside and not so readily seen. Some of the scarifying above mentioned resembles slight incising made in soft, unfired clay.

The decoration was all impressed and applied before the pottery was fired. It consists of lines, gashes, and pits, rows and zigzags of small square and triangular impressions made with a stamp or rocking stamp, rows of transverse cord impressions, and impressions of fabric. No piece of pottery was found that bore any sculpture or that had been painted. Some of the impressions and pits, such as those shown on the fragment illustrated on Plate X, figure 2, were, probably, made with a stylus such as some of the bone objects described as awls, on page 64, and illustrated on Plate XVII, figures 3, 16; Plate XIX, figures 16, 17. No impressions of carved paddles or of paddles wound with cord or netting were found on any of the ware. The decorative art of pottery is discussed on page 85.

No fragment of pottery bearing finger impressions was found by us, and only one piece, the one illustrated on Plate IX, figure 8, had finger-nail impressions, but Patterson (a, page 252) states that impressions such as might have been made by the finger-nail may be seen on pieces in his collection.

A rocking stamp was used to decorate about a tenth of the ware, but the edge of a quahog shell was apparently not used for this purpose here as it was on the New York coast. The fragment illustrated on Plate X, figure 22, bears a zigzag apparently impressed with a knife-edged rocking stamp. The object made of bone or antler described as a pendant on page 79 and illustrated on Plate XIX, figure 19, was probably a rocking stamp used in stamping pottery. Marks on soft clay experimentally made by us with this object are illustrated on Plate IX, figure 9. Those on the left were made with the object held vertically, and resemble the lines of square checks impressed on the fragments of pottery illustrated on Plate X, figures 14, 15, 17. Those on the right were made with the object held obliquely and resemble the lines of triangles impressed on the fragments illustrated in figures 12 and 18. This similarity is strong evidence that the object was used as a stamp. A rocking stamp of this kind rather than a roulette was certainly used for at least some of the work, since the impressions on some of the ware, such as are illustrated on Plate X, figures 1, 18, 19, are deep at the ends like those illustrated on Plate IX, figures 9, 10, whereas if made with a roulette the ends of the impressions would become shallower and shallower, like the impressions illustrated on Plate X, figures 1, 12, 14, 15.

Some of the impressions made with the rocking stamp overlap. Short vertical rows of rectangular depressions probably made with a rocking stamp show on the fragment of a pot rim, one of a lot of fragments of one pot, illustrated on Plate X, figure 4. On the reverse the rocking stamp was tilted to one side until the top of the V-shaped interval between the faces of its raised rectangles touched one side of the impressed line, giving a raised saw-like edge on the opposite side similar to those shown in figures 18 and 23. The rows are at a slight angle to the rim and extend over to the centre of the rounded rim edge.

Curved rows of impressions arranged in fan-shape and apparently made with the same rocking stamp may be seen on the inner surface of another piece of the same rim shown in Plate X, figure 15.

Such rows of impressions arranged in zigzags may be seen on the fragments of pottery illustrated on Plate X, figures 1, 20, 21, 23, 27. Similar

zigzag impressions experimentally made by us on modelling clay with the object illustrated on Plate XIX, figure 19, may be seen on Plate IX, figure 10. Those on the left made with the object held vertically resemble the impressions on the fragment of pottery illustrated on Plate X, figure 21, and those on the right made with the object held obliquely resemble the impressions on the fragments illustrated on Plate X, figures 1, 19, 23.

Patterson noticed this zigzag roulette work on specimens in his collection, and states (a, page 225) that the decoration on the pottery was sometimes made with the points of small teeth of an instrument about 2 inches long, that one straight row of tooth impressions was made, then one end of the instrument was swung around, and a second row made at an angle with the first row, then the other end was moved in the same way, and thus a zigzag was formed. Similar zigzag impressions, made with a stamp, occur on fragments of pottery found by Loomis in a shell-heap in Maine[1].

Lines at right angles to the trend of the rim show on the fragment of a thick rim having a large scallop, one of a lot of fragments of one pot, illustrated on Plate X, figure 16. This fragment is apparently a piece of the same pot as is shown in figure 12. Both the lines and spaces between them vary in width, and to the left are pits, apparently made with a stylus. These two features suggest that the whole work is freehand stylus markings, and it is difficult to believe that it is stamp or rocking stamp work. On the inside of this rim the lines curve up at a slight angle to the edge and continue over and across on the rim obliquely at about 45 degrees to its edges.

Designs made up of straight or curved lines of transverse and parallel or nearly parallel impressions of two-ply twisted cord were made with cord wound on a twig or similar object about an eighth of an inch in diameter. This object was at least in some cases curved, possibly in the form of a hoop or loop. The impressions may have been made with the edge of a basket or birch-bark vessel whipped with cord. Such lines of transverse cord impressions may be seen on one hundred and eighty-one fragments of the pottery, the equivalent of about thirty-eight pots. Of the twenty fragments of pottery found in the prehistoric cemetery about half bear these lines.

Straight rows of such cord impressions may be seen on the fragments of pottery illustrated on Plate VIII, figure 11, Plate IX, figure 4, and Plate XI, figures 1-5, 7-12. How these were made is suggested by similar impressions on modelling clay, experimentally made by us with the twig wound with twisted cord, illustrated on Plate IX, figure 11. These are illustrated in figure 14. Curved lines of such impressions may be seen on the fragments illustrated on Plate XI, figures 3, 5, 6, and similar impressions on modelling clay, experimentally made by the writer with the loop of twig wound with twisted cord illustrated on Plate IX, figure 13, are illustrated on Plate IX, figure 16. They were apparently made chiefly to decorate rather than to malleate the ware as they are shallow, do not overlap, and are sparse.

Lines of such parallel transverse cord impressions show on the fragment illustrated on Plate XI, figure 1, which is one of twelve fragments of the

[1] Cf. Loomis, Fig. 14.

rim among one hundred and twenty-three fragments representing three-fourths of one pot found in heap D. These lines are arranged in parallel, oblique rows just below the rim and in horizontal rows around the pot below. There are also long, oblique rows across the slightly lipped rim. That the impressions are not those of a bag or fabric is implied by the oblique lines on the edge of this fragment, and almost proved by the two nearly vertical lines indenting the lip of another fragment (Plate XI, figure 2) which is coated with carbonaceous matter on the scarified inner surface.

A row of oblique impressions, probably made with a cord-wound twig, may be seen on the lipped edge of the rim (Plate XI, figure 3). By pressing out the lip it was given a scalloped edge. Close under the lip, and paralleling it, is a row of parallel cord impressions, apparently made before the scallops in the lip, because the scallops are bent down over it. Closely following these is a row of triangular incisions or punched depressions. Below this is another row of parallel cord impressions and then another row of larger, nearly rectangular, punched depressions, followed, at the left, by a fan-like design composed of curved, nearly concentric rows of two-ply cord impressions, which may have been made by rolling a cord-wound twig or stamping with a cord-wound loop. To the right are two wide oblique lines, slanting in different directions and converging at the top, which were possibly drawn, but probably pressed, into the clay, perhaps by a rocking stamp, after which a row of transverse cord impressions was made on top of them. Had the cord impressions been made first, they would be smeared, and had the rocking stamp been cord-wound the ends of the cord impressions would extend beyond the edges of the grooved lines. In the triangular space formed by the converging oblique lines, and roughly parallel with the line at the left, are two oblique rows of cord impressions. At the extreme right of the fragment are other rows of cord impressions slanting in the opposite direction.

The rows of transverse parallel cord impressions on the fragment shown on Plate XI, figure 4, are at right angles to the slightly lipped rim, as they are in a total of three pots, represented by six fragments. On four pots, represented by twenty-two fragments, they run at an angle of about 45 degrees to the edge of the rim (Plate XI, figures 1, 7). The rim of one pot had these lines both at right angles in four fragments, and oblique in six. On the flat top of the rim are three curved impressions, apparently part of a row that encircled the pot.

Both straight lines and nearly concentric curved rows of transverse cord impressions, the latter forming a fan-like design, show on one of the fragments illustrated on Plate XI, figure 5. Such fan-like designs show on thirteen fragments from heap A, three from heap D, two from heap L, and one from heap N.

Two sets of nearly concentric curved lines of such cord impressions, forming a fan-like design, show on the fragment of pottery illustrated in Plate XI, figure 6.

The straight rows of transverse parallel impressions of two-ply twisted cord are in some cases close together, and the winding is also sometimes close. In the fragment illustrated on Plate XI, figure 8, the lines and the coils are about half the usual distance apart and there is a part of a double

row of obliquely incised marks. In some cases (figure 9) the cord was about twice the usual size, as indicated by the straight rows of transverse parallel impressions. On this piece the coils are wider apart than usual. The cord is larger and the spacing of the coil is greater on the fragment of the rim of a pot illustrated in figure 10, in which the two-ply nature of the cord shows particularly well. The cord was clearly twisted clockwise and the individual strands are twisted counter-clockwise. On the middle of the rather flat rim is a band of parallel impressions of cord, each impression being at an angle of about 45 degrees to the tangent of the rim.

Both distinctness of impression and wide spacing of the cord are also shown on the rim fragment illustrated in the next figure. The cord was twisted counter-clockwise. The strands impressed on the fragment illustrated in figure 12 are more loosely twined, but some of the impressions show clearly a counter-clockwise twist.

Impressions apparently made with strips of bark, or with a split root or wooden splint like the edge of a basket, rather than with twisted cord or with rocking stamp or a carved paddle, may be seen applied thickly and irregularly on five pieces that probably represent three pots, all from heap A, one of which is illustrated on Plate XI, figure 14.

Rows of transverse impressions, apparently made with a square-cornered band or lashing, may be seen on the fragment of a rim illustrated in figure 15. The impressions are slightly oblique in the rows, and the rows are irregularly spaced, the two at the top overlapping. These rows also cross the edge of the rim in long obliques. Similar rows of nearly transverse impressions made with the twig wound with square-cut splints, illustrated on Plate IX, figure 12, have been experimentally made on modelling clay (Plate IX, figure 15).

The impression of fabric is suggested by the four fragments of pottery illustrated on Plate XI, figure 7. All of these are from one pot. They bear long rows of transverse cord impressions resembling those made with a cord-wound twig, vertical lines of what seem to be impressions of twisted cord, and rows of pits. The rows of transverse cord impressions near the rim are oblique and parallel; those lower down are horizontal and possibly encircled the pot. The length, regularity, and continuity of the lines (*See also* figure 1) suggest that the impression is of a bag used in lifting or holding together the soft, unfired pot; or that the pottery was built up inside a bag that was burned in firing the vessel, the row of pits corresponding to a row of knots.

The purpose of the roughening on some of the ware, where it is apparently not decorative (Plate XI, figure 14), may have been to keep it from slipping in the hands. In fact the decorative work may have served this purpose secondarily.

An impression seemingly of woven porcupine quills or moose hair may be seen on three fragments of pottery (Plate IX, figure 6, Plate X, figure 24, and Plate XI, figure 13). These impressions do not show a twist, nor are they as rough or as even longitudinally as those made by cord. They bend suddenly as if made by a quill or hair rather than by soft cord, and they do not show striations like impressions of grass. A positive of this fabric made by making a plaster mould of the impression on the fragment of pottery illustrated on Plate IX, figure 6, is shown on

Plate IX, figure 7. The impressions on the fragment illustrated on Plate XI, figure 13, suggest that the design of the fabric used in impressing it was of diagonal weave.

In New Brunswick, cord impressions, as well as those of fabrics, are considered by Mr. William McIntosh to be absent from the pottery. Mr. McIntosh bases his knowledge chiefly on the specimens in the Museum of the Natural History Society of New Brunswick, St. John.

After the decoration was finished the pot was set to dry. The firing of the pottery was crudely done at low temperatures, as is clearly shown by the crumbling nature of the body and its imperfectly oxidized interior. The more complete oxidization of the exterior gave it a buff, salmon, or red colour, unlike the brownish grey, incompletely oxidized interior. Complete oxidization took place only on the exterior, and sometimes even the surface was partly underburned, uneven exposure to the fire producing a mottled effect. That the firing was done in more or less open fires is indicated by the blackness of the inner part of the pottery and by the mottled or irregularly burned surface of the ware. The shell fragments included in the clay are an indication of the temperature of burning. Shells are fairly pure carbonate of lime, and if heated to about 1,650° F. change to quicklime, and afterwards slake to powder, destroying the pot which contained them. As the shell fragments referred to are intact in the body, the temperature must have been far below 1,650 degrees. A temperature of about 1,300 degrees will produce a light red colour on the surface of a red burning clay, but will leave the interior grey or black, and this is probably as great a heat as the potters were able to obtain. Fragments of charcoal were frequently found, some of which may be products of the open fires. Burned patches of ground were also discovered, which may have been the pottery-firing sites. Examination of the fragments of pottery shows that none of the ware was surface-cracked or crazed, either in air drying or burning, so that the various stages of manufacture up to the finished product were successfully conducted.

HABITATIONS

No remains of habitations were discovered. It seems altogether likely that the habitations used by these people were such as to leave no marked depressions or signs other than the abundance of village refuse making up the shell-heaps. According to Lescarbot, the Micmacs in summer dwelt mostly on the coast and in winter retired to the more sheltered interior[1] and camped on the shores of lakes.

Caches. Cache holes for food, such as have been found in southern New England, or caches of objects, such as occur throughout the Atlantic states and in the Mississippi valley, were not found here, but probably this may be ascribed to scarcity and accident rather than to their absence; or, food may have been cached above ground.

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[1] Cf. Piers (a), p. 101.

TOOLS USED BY MEN

A number of artifacts considered to be tools were found. Among these, celts, hammerstones, whetstones, wedges made of bones of the whale and of antler, a chisel-like object made of bone, a pin-shaped object made of antler, knives made of beaver teeth and woodchuck teeth, flakes of stone, probably used as knives, and knives chipped from stone probably were used by men. No arrow-shaft smoothers made of stone, gouges, celts made of antler, grooved axes, points for drills, or cupped stones were found, although gouges and grooved axes are found in Nova Scotia and, according to Patterson (a, page 244), two drills chipped from stone were found at Annapolis. Similar drills are known to have been found in shell-heaps in Maine.

Celts Made of Stone. Celts or adzes made of stone are among the most common artifacts found (Plates XII and XIII). Fifty-nine specimens were collected from heap A, thirty-three from heap D, five on its surface, one from the surface of heap E, one from the prehistoric cemetery, two from heap L, six from heap M, three from the eastern part of heap N, and four were presented by Mr. Peter Millar from heap O, making a total of a hundred and thirteen secured by us on this harbour, besides those collected by Patterson and others.

According to the catalogue of the Patterson collection, four were found on Merigomish harbour, one on Olding island, three on Big island, eight in the prehistoric cemetery, thirteen in the heap on the Millar farm, and twenty-four, three of them being broken and one grooved on the side edges, on the same farm. Adzes have been found by Mr. Charles Smith on his farm on the mainland, about one mile southwest of Merigomish. Two of these he presented to the National Museum of Canada. Mr. Donald McDonald presented one from heap D, and Mr. Wintemberg collected one from the beach in front of the same heap. This makes a total of at least a hundred and sixty-nine known specimens from the harbour.

Twelve have been found in the vicinity of the harbour, according to the Patterson catalogue; two, one of them grooved on the rounded side of the head, and a double-bitted one at Big gut on East river, Pictou; one on the beach at Pictou; a double-bitted one at South Pictou; seven on Middle River point; and a fragment of one at Town gut, Pictou.

The celts are asymmetrical, except one illustrated on Plate XII, figure 6. They are flatter on one side than on the other and the bits were sharpened by bevelling more acutely from one side than from the other. This statement is based upon forty-six complete celts from heap A, twenty-eight specimens from heap D, five from heap M, and all others which show the edge. In general they are rather crude and were apparently roughly used.

In size they vary from a mere sharpened flake 2 inches long (Plate XII, figure 3), through a typical specimen, $2\frac{3}{4}$ inches long (figure 2), to one fragment, a head end, $6\frac{1}{4}$ inches long, that must be of an adze at least $8\frac{1}{2}$ and probably 10 inches long, and another $7\frac{1}{4}$ inches long (Plate XIII, figure 1). The average length is about 4 inches. Patterson (a, page 245) refers to a celt $1\frac{1}{2}$ inches long. One found in heap M is 9 inches long.

The material of most of them is dark feldspathic rock, but a few from heap A and one from heap D are of mica schist. At least one from heap A and two from heap D are of slate, and one from heap D is of sandstone. The last is apparently too soft for use. All are apparently made from pebbles, nearly all slightly pecked before being rubbed, and all somewhat rubbed to shape. A few were roughly chipped before being pecked or rubbed. The polishing on none was over much of the surface. About 25 per cent of those found in heap A and 13 per cent of those found in heap D seem unfinished, although some of these may have been used as they are, and none can be definitely determined as unfinished.

Many of the heads show the unchanged natural surface of the stone in some cases nearly flat on the end, but in most of those from heap A and in six of those from heap D they have been purposely flattened by pecking, or accidentally by use. The heads do not seem to have been intentionally thinned to facilitate hafting, some being thicker there than at the middle of the shaft, though most are thinner and narrower. In about half of those found in heap D the heads are narrower than the cutting edge. The heads of at least three from heap A and four from heap D are battered and fractured as if they had been used as wedges, and several more are battered, probably by pecking done to bring them to form. The head of the celt illustrated on Plate XIII, figure 2, is much battered and fractured, apparently from long pounding with something or on something.

Two specimens out of the forty-six complete adzes found in heap A were sharpened at both ends. One (Plate XIII, figure 4) is made of dark grey schistose slate and resembles a gorget, without perforations, sharpened at both ends. One of the twenty-three complete adzes from heap D is double-bitted. It is made of slate. One (figure 5) of hard grey stone is double-bitted and one of the edges is slightly curved like a gouge.

Five from heap A and one from heap D were apparently used also as hammers until the edges were much battered; three from heap A and one found on the beach at heap D were blunted on the edges, perhaps only by rough usage; sixteen from heap D are chipped on the edges, perhaps by such use. It has been suggested that they were pounded on the edge to chip off pieces on either side to save some grinding in resharpening, but the pounding appears to have dulled rather than sharpened them. The edge of the specimen illustrated on Plate XIII, figure 2, is chipped off on the reverse and smoothed by later use. One of the celts (Plate XIV, figure 8), that has a battered edge as if it had been used as a hammer, bears a pit in the head end of each side, like the pits in a pitted hammer-stone; across nearly all of one side edge are smooth transverse grooves like those on what is thought to be a fragment of a celt, mentioned on page 49. One specimen, apparently the head end of a celt, found in heap A, is pecked and rubbed from a dark, hard, tough, crystalline rock. One end is battered and fractured from use in pounding. Red paint on a battered spot on each side suggests that it was used instead of a pestle to crush stone for paint.

The side edges of a few from heap D are flattened. The largest specimen found in heap D (Plate XIII, figure 1) has its side edges shaped as if for hafting. The side edges of the celt on Plate XIII, figure 2, are

battered, except near the cutting edge, somewhat irregularly, but each tends to present two longitudinal facets. A hollow in the upper facet on the left side edge has a corresponding one in the lower facet of that edge at a higher point. Both of these hollows tend to run parallel and diagonally across the side edge. A fragment, apparently of a celt, from heap D, shows part of a side edge which is slightly indented, and this depression bears a series of smooth transverse grooves, running somewhat obliquely. In this respect this celt is like that from heap A, described on page 48 (Plate XIV, figure 8). A small specimen (Plate XIII, figure 3) is notched on the side edges and slightly grooved on the sides. The head being thick and wide rather than tapering, such grooving would be sufficient to facilitate hafting. It may be compared with three notched hammers described on page 53 (Plate XIV, figure 9). A daub of red on one side of this notched adze may be due to iron rust. The small celt (Plate XII, figure 2) is made of a symmetrical pebble sharpened by rubbing, and is chipped and rubbed on the side edges.

The celt found on the surface of heap E was chipped to form from hard grey stone. The head is nearly straight across and is narrower than the bit, which, except at the very cutting edge, is wider than the middle part of the celt. The celt found in the refuse of the prehistoric cemetery is in two fragments, and was made of a fragment of stone trapezoidal in cross-section, by sharpening one end to a symmetrical form, smoothing the wider side, and rounding the corners slightly. It has much of its surface seemingly unworked and is one of the few neatly formed celts found on the harbour.

Some celts were apparently broken in the process of making. One such specimen, found on the surface of heap D, is a long fragment of hard grey stone with nearly the entire surface chipped to form, and the side edges battered. Another fragment, of similar material, from the same place, similarly chipped and battered, bears some peck marks and is probably a celt broken in the making. A large pebble found in heap A is pecked over most of its surface, apparently to produce a celt; a broken corner, amounting to about an eighth of the object, possibly caused its rejection. It has since been weathered so that minute ridges of hard rock are left standing above the general surface.

The celt on Plate XII, figure 6, is one of two that are much alike, found in heap L. It is simply a smooth pebble of suitable form with one end sharpened to a keen edge by rubbing. It is the only celt having a symmetrical edge that was obtained on the harbour. The pebble, however, is slightly asymmetrical, but edgewise rather than sidewise like the cutting edges of the other specimens.

A pebble of soft sandstone $1\frac{5}{8}$ inches long, from heap D, is ground off like an adze on the more convex side of one end. The edge is chipped off on both sides. It is too light, too small, and has too asymmetrical a cutting edge for use as a hatchet, and is too light and too small for use as an adze. It was possibly hafted and used as a chisel, though the material seems too soft for a serviceable chisel, as is partly shown by the chipped edge. It may have been a toy.

Besides the celt with the notched side edges and slight groove, mentioned on page 49 and illustrated on Plate XIII, figure 3, the two objects described on page 53 as notched hammers may be fragments of notched

adzes. No knobbed adzes were found, but a few have been found in Nova Scotia. One, said to be from Halifax county, is Cat. No. 47 in the Fairbanks collection in the Provincial Museum[1]. Some have three knobs. These knobs on one side of the celts suggest that they were hafted as adzes rather than as axes.

On the whole the celts of Merigomish harbour are chiefly remarkable for being crude and asymmetrical as if used entirely as adzes, only the one shown on Plate XII, figure 6, being symmetrical. Two-thirds of them were broken in two. The cutting edges are nearly convex in outline rather than straight, and, consequently, could be used to cut a slight groove somewhat as a gouge can be used. They are not noticeably oblique, that is, the edge is not nearer the head at one end than at the other except in a few cases, such as the double-bitted celt on Plate XIII, figure 4. In such cases this feature is probably due to careless sharpening or to re-sharpening after a slight break or nick in one end without straightening the whole edge. One described on page 49 is notched. Three or 4 per cent are double-bitted. A double-bitted celt was found at Tracadie, Nova Scotia, and is in the possession of Mr. Stead, the Dominion resident engineer at Chatham, New Brunswick.

As compared with grooved axes, which are rare[2] in Nova Scotia, celts are unusually common, being surpassed in numbers only by points chipped out of stone for arrows and knives, by points rubbed out of bone for such uses as arrows, barbs, and awls, and by potsherds. Piers describes the Nova Scotia adzes as made from quartzite, hard slate, and, in one case, from sandstone, by pecking and polishing, a few being very roughly chipped as if incomplete, and as being neat, and slender, although some are only twice as long as broad. He says that so far as he knows all the celts found in Nova Scotia are asymmetrical, and are believed by him to have been left by Eskimos, and that the rare grooved ax was left by Micmacs during a shorter period of occupancy. But on Merigomish harbour there are many of these adzes and no grooved axes in the same shell-heaps with pottery that is clearly of Algonkian type, whereas the nearest Eskimos do not make pottery and it is not reported from their archæological sites. Micmac Indians still live in the vicinity, even on Indian island near heap B and within a mile of heaps A and D, which were the two largest heaps that were dug.

Hafting and Use. The celts, especially those with asymmetrical bits, were probably hafted and used in carpenter work as adzes. The asymmetrical condition of the bit suggests that all were used as adzes rather than as axes. Some, however, may have been used as axes for cutting wood, or even for hunting or in warfare, as mentioned on pages 21 and 76. None, in collections from Nova Scotia, was used strictly as a chisel, in the opinion of Piers (a, page 113). The celts may have been hafted by winding a withe about them, or by fitting them into a hole in the side of a fairly large handle. An adze, Cat. No. 19 in the Patterson collection, from heap O, shows around an oval-shaped hollow about midway between the two ends on one side an area about 1 by 3 inches, worn smooth possibly by the end of the adze handle.

[1] Cf. Piers (c), Fig. 47, Plate II, and p. 41.
[2] Cf. Piers (a), pp. 111 and 113; Piers (c), p. 36 et seq.

Gouges. No gouges were found and there is none in the Patterson collection from Merigomish harbour. However, gouges are about half as numerous as adzes made of stone in general collections from Nova Scotia. Many specimens, especially from Grand lake and Shubenacadie river, are in the Provincial Museum at Halifax[1]. In southern New England gouges are abundant, although very rarely found in the shell-heaps or the graves of the historic tribes. They are abundant[2] also in certain apparently very old graves in the northern Champlain valley. The Nova Scotian gouges are made of material like that used for celts or adzes, into which they grade. There are three classes. In the first the groove is almost imperceptible, and confined to the vicinity of the cutting edge. In the second class the groove is deep, well defined, and extends about half the length of the gouge, suggesting strongly that the gouges were hafted as adzes. In the third class the groove is deep, and well defined, and extends the whole length of the gouge. The presence of about half as many gouges as celts in other parts of the province, and their complete absence at the harbour, where so many celts were found, seems to suggest that the prehistoric peoples of Nova Scotia included some of a culture or tribe different from those at Merigomish: or it may indicate that the prehistoric occupations of the province included one or more that involved the use of a gouge, and were practised commonly perhaps only in the interior of the province.

Grooved Axes. Grooved axes, which are common south and west of Merigomish, in much of the area inhabited by other Algonkian tribes, and which are said to have been found on Prince Edward Island, are absent both among the finds on Merigomish harbour and in the Eisenhauer shell-heap, unless the notched adze described on page 49 (Plate XIII, figure 3) may be considered as one. They are rare in Nova Scotia[3], only twelve being known from the province, one in the National Museum of Canada, one in the Patterson collection, and ten in the Provincial Museum, two of these being in the general collection, six in the Des Brisay collection, and two in the Fairbanks collection. Patterson (a, page 246) states that he obtained his from St. Mary, and that it is the only one he had from Nova Scotia. Another of these axes is from the north bank of Shubenacadie river, about 1½ miles south of Enfield, in Hants county. One in the Des Brisay collection is from near New Germany, Lahave river, and another in that collection is from near Chelsea. One of the axes is double-grooved, and, therefore, if it really came from Nova Scotia, is unique in the province. They are made from waterworn, oval, quartzite pebbles, and the edge and groove were made by pecking. The groove completely encircles the ax.

Hammerstones. Hammerstones to the number of ten were found on the harbour, also the seven specimens described below that may have been used partly as hammers, five celts (pages 48 and 53) that seem to have been used as hammers until the edges had been much battered, and three celts that were blunted on the edges, possibly by such use. Three of the hammerstones are pebbles about as large as a man's fist, two are

[1] Cf. Piers (a), p. 113.
[2] Cf. Dixon, p. 13.
[3] Cf. Piers (a), pp. 111, 113.

smaller, flattish pebbles, four are nearly spherical, and one is a large disk-shaped pebble. Four are from heap A, four from heap D, one from the surface of heap E, and one from heap M.

Typical specimens are shown on Plate XIV. Simple hammerstones consist of pebbles or masses of rock showing battered and sometimes chipped surfaces on the ends or entire circumference, and sometimes are faceted. These are apparently simple or less specialized forms of the pitted hammerstones, which were not found. The pitted hammerstones consist of pebbles or blocks of waterworn stone which were pecked on the middle of either side, apparently for the reception of the thumb upon one side and the middle finger on the other to facilitate holding the object as a hand hammer. The celt shown on Plate XIV, figure 8, has such a pit on each side and the edge is fractured and battered as if used as a hammer. Such pitted hammerstones are common in Ontario, Michigan, and various parts of the Mississippi valley. Perhaps some of the hammerstones found were used only temporarily, and all only for pounding and not as anvils. One specimen is apparently a celt which was used as a hammerstone until the head was fractured and the cutting edge reduced to two battered facets. These hammerstones were probably used in chipping stone for the manufacture of points, driving stakes, pounding meat, cracking nuts, and for other purposes.

Of the three hammerstones the size of a fist, one found in heap A is a purple, jasper-quartzite pebble, much battered on one end by repeated use, fractured slightly around the edge of the battered end, and has a large piece of one side broken away. Another from the same heap (figure 1) is a yellow quartzite pebble, battered on both ends and in a spot near the middle of one side. On one end the battering has made a smooth surface with a slight fracture at one side; on the other it has made a rougher surface and struck off several chips at one side. The third specimen, from heap D, is a yellow quartzite pebble, slightly and smoothly battered on one end and an adjacent edge.

Of the two smaller and flatter specimens, one (Plate XIV, figure 2) is a disk-shaped, granite pebble, thicker on one edge than the other, that has been battered in smooth facets around both sides of the entire edge. The other specimen (figure 3) appears to be made from the end of a wide, flat, well-made celt of granite rather than from an oval pebble. The surface seems to have been polished. The top has a large piece chipped off on one side. The side edges are flattened by battering, and the lower edge is battered smoothly into two long facets, so that the striking edge resembles in shape the edge of a celt, except that the facets meet obtusely instead of acutely.

Of the four nearly spherical hammerstones, three are about 2 inches in diameter. One of these (Plate XIV, figure 4) is a purple, jaspery quartzite pebble and is battered on the higher parts of about half its surface. The next (figure 5) is also a purple, jaspery quartzite and is battered all over in crude facets and into a form suggesting a decahedron. Another, about the same size, of granite (figure 6) is an even more symmetrical decahedron. The fourth, about 3 inches in diameter and of purple sandstone, was found in heap D and is battered over much of its disintegrated surface in a way that changes it only slightly in appearance from a natural pebble.

The large disk-shaped pebble is of purple sandstone and was found in heap A. It bears transverse hacks nearly all the way around the edge, as if used to pound across the sharp edge of something. If it were pitted in the middle of both sides and the edge were bruised rather than transversely hacked it would resemble the typical pitted hammerstone.

A broken end of a pebble about 3 inches long, found in heap M, has been battered on one edge and two sides as if from use as a small hammer or from being pounded upon.

The pestle-shaped hammer-pebble made of hornblende granite, found on heap C and mentioned on page 8 (Plate XIV, figure 7), is somewhat shaped by pecking and rubbing. One end is larger than the other, and both are battered in two bulging facets running the width of the end, apparently from use as a hammer.

A celt made of hornblende granite (Plate XIV, figure 8) has a pit in each side about as near the head as the side edges. The edge is fractured and much battered, as if from use as a hammer.

One specimen, apparently the head end of a celt, described on page 48, has one end battered and fractured from use in pounding. Red paint on a battered spot on each side suggests that it was used as a hammer or in place of a pestle in crushing colouring matter.

The other three specimens may be notched hammers. The first (Plate XIV, figure 9) is comparable with the notched celt on Plate XIII, figure 3. It is a flattish, porphyrite pebble, about 3 inches long, 1½ inches wide, 1 inch thick, and oval in cross-section, with a large notch in both side-edges made by pecking. The ends have been much battered, apparently by use. The other two specimens were found in heap D. One of these, consisting of an oblong piece of metargillite, perhaps part of an unfinished celt, broken at both ends, is crudely chipped into shape on both sides, with the higher parts of one of the sides smoothed, and has a wide, deep notch on one edge made by battering. Marks of battering can also be seen on the edge at each end of the notch. The broken ends are not battered. The other specimen looks like a fragment of the upper end of a celt, made of porphyrite. Both edges are notched and the top is battered. These two specimens may be fragments of notched or grooved axes, but axes of that kind are so rarely found in the region that they are more probably hammers or parts of broken, notched celts similar to that shown on Plate XIII, figure 3.

Grooved hammer or club heads are very rare in Nova Scotia. Piers (a, page 114) has one, dug up at Dartmouth, that is an egg-shaped quartzite pebble 3½ inches long, encircled with a pecked groove. He reports another in the Des Brisay collection in the Provincial Museum, Halifax. These may have been used as weapons. Piers (a, page 114) states that the Micmacs have a tradition that such clubs had magical properties, and when thrown in warfare could be made to strike an enemy, even behind a shelter. There is a maul made of stone from Nova Scotia in the Peabody Museum of Harvard University.

Whetstones. Grinding stones or whetstones of several kinds were found. These include five large grinders (Plate XV, figure 1), rubbed pebbles (figure 3), small rubbed fragments of stone, and three plough grinders (figure 2). Three of the whetstones and one plough grinder

have step-like offsets on one edge. More particularly, these comprise five large sandstone specimens, four of which are dome-shaped fragments of concretions; small specimens made of pebbles having a gritty character; fragments of slabs of sandstone; and irregular pieces of sandstone. Some of each class are rubbed on one side, others on both.

These whetstones were probably used for shaping, smoothing, and sharpening: stone celts; animal bones; pieces of bone that were to be used for points, harpoon heads, awls, and needles; pieces of bone, and of antler and beaver, and woodchuck teeth for wedges and similar purposes.

These whetstones were evidently for shaping and sharpening various tools. They were probably used for smoothing and sharpening stone celts, animal bones, and pieces of bone that were to be used for points, harpoon heads, awls, and needles, pieces of bone and antler for wedges, beaver, woodchuck, and for similar purposes.

One of the five large stones apparently used for grinding was found in heap A, three in heap D, and one in heap M. One is of sandstone, and four are dome-shaped fragments of large sandstone concretions such as are found along some of the beaches of the harbour. One of these (Plate XV, figure 1) is of sandstone. It is the larger fragment of a broken object that had a shallow, smooth, longitudinal hollow over practically all one side, apparently made by sharpening or grinding upon it. The fragment of a sandstone pebble found in heap M is about 8 inches across and is rubbed on one side as if from grinding objects into shape upon it. The surface, being smoothed over rather than ground down to one large plane, suggests that only small objects that would ride over the unevennesses were rubbed upon it. A fragment of a sandstone concretion 9 inches in diameter, found in heap A, was not apparently purposely chipped, and is rubbed in one place on the convex side and to a nearly flat surface on the whole of the other side. One fragment of a large sandstone concretion about 9 inches in diameter, found in heap D, is roughly chipped around the edge and is rubbed on both sides. On the concave side the most rubbed surfaces are large and smooth, as if caused by sharpening celts upon them. The other specimen of a sandstone concretion, found in heap D, a somewhat similar fragment 7½ inches across, was much weathered before being rubbed. It was apparently not purposely chipped and is rubbed only in places on the two sides.

Of the rubbed pebbles, eight are from heap A, five from heap D, and one from heap L. Eight are whetted on one side, six on both. One from heap A is an angular, waterworn pebble 4½ inches long by 1½ inches in cross-section, whetted on one side; another is a flat, plummet-shaped pebble 3½ inches long, whetted on one side. Ends of two sandy argillite pebbles less than 1 inch thick, over 4 inches long, and nearly 1½ inches wide, and a whole gritty pebble of similar size, all three found in heap D, are slightly whetted on one side. An irregular, broken pebble, a little over ¼ inch thick and about 2 by 4 inches, found in heap A, is very slightly whetted on one side. A fragment of a long, oval pebble of schistose slate, found in shell-heap L, was used on one side as a whetstone. A pebble from heap A, 1 inch by 1½ inches in section, lacking both ends, is rubbed on two sides and an edge. A whetstone found in heap A, of about the same size as the one illustrated on Plate XV, figure 3, is a fragment of a similar

argillite pebble slightly whetted on the side, which was the natural surface of the pebble. One edge was smoothed nearly flat by longitudinal rubbing, and nearly half of the edge has since been broken away. Close to this break, or near the middle of this edge of the whetstone, is a single offset or step similar to the two on the whetstone described below. A flat, oblong pebble, a little over ¼ inch thick and about 2 by 4 inches, found in heap A, is whetted on both sides. Another specimen found in heap A is an argillite pebble, about ¼ inch thick by 4 inches long by 2 wide, whetted with longitudinal striations over most of one side and in patches on the other side. One edge of this specimen is ground somewhat flat, with a sharp angle where it meets the sides. There are two offsets on this edge (figure 3) which are again referred to on page 56. An end of a gritty pebble about 4 inches long, whetted in patches over most of both sides and one edge, was also found in heap D. A flat, waterworn fragment of an argillite pebble about ¼ inch thick, 2 wide, and about 5 inches long, whetted on both sides, was found in heap D. One specimen found in heap A looks like a section of a large celt, and is worn on both broken ends, but unlike most of the celts found, is of sandstone. It is whetted all over, except on the ends, and cracked by fire. A whetstone from heap M made of an irregularly rectangular slab of sandstone, about 2 inches wide, 4 inches long, and nearly ½ inch thick, is worn smooth on both sides and has all the edges rubbed.

Of the fragments of slabs of sandstone, one is from heap A and four are from heap D. One from heap D is rubbed on one side, the other four specimens on both sides. The one rubbed entirely over one side only is about ½ inch thick by 2¾ inches long. Of the four rubbed entirely over both sides, one from heap D is about 1½ inches thick by 3 inches across, another about ½ inch thick by 2¾ inches long, and still another about ½ inch thick by 4 inches long. A fourth, found in heap A, is a waterworn slab of sandy argillite less than ¾ inch thick by 2½ by 4 inches.

There are three fragments of irregular pieces of sandstone from heap D. Two are rubbed entirely over one side, one on both sides. Of the two rubbed on one side one is thick, the other about 3 by 4 inches. The one rubbed entirely over both sides is from ⅜ to ⅝ inch thick and 1 by 2 inches.

The three plough grinders each have one edge that is bevelled from both sides and flattened on the very edge probably from use. One was found in heap A and two in heap D. The one found in heap A (Plate XV, figure 2) is made of a fragment of mica schist slightly over 6 inches long by 2½ inches wide and less than ½ inch thick. One long, narrow edge is slightly rounded from the flat by longitudinal grinding, and on both sides near the edge the surface has been slightly ground on a bevel to smooth the slope from the sides to this edge. The other edges are not bevelled. It has been whetted slightly in the middle of the reverse. This whetting and the plough edge are the only signs of artificial work on this angular and apparently unweathered rock.

The two other plough grinders are made from fragments of fine sandstone about ½ inch thick, 2 inches wide, and 3 inches long, and are whetted on both sides. The first is bevelled on each side of the longest edge, which is flattened probably from use. The other plough grinder has one side

edge greatly bevelled from one side, hardly any from the other, and is flattened on the very edge. The other side edge, though not bevelled from the sides, is rubbed flat at a slight angle, and the angles or corners of this flat surface are sharp. There is an offset near the middle of this edge. One end of the specimen also is rubbed flat.

Of the four objects having a step-like offset near the middle of one edge, two have a single offset and the others two. Those with a single offset consist of a whetstone made of an argillite pebble, found in heap A, and a plough grinder from heap D. The specimens with two offsets are the whetstone from heap A, described above and illustrated on Plate XV, figure 3, and the whetstone from heap M. The offsets on the specimen in figure 3 are about $\frac{1}{4}$ inch apart and those on the other specimen, which are slightly oblique, are about $\frac{1}{8}$ inch apart, one of them being lower than the other and deeper at one end than at the other. The offset on the plough grinder is about $\frac{1}{16}$ inch high and crosses the edge at a slight angle. The corners or angles of the offsets are all more or less sharp; those on the specimen in figure 3 appear to be slightly undercut. The offsets appear to have been produced by grinding the edge of the objects lengthwise rather than crosswise. Their purpose is unknown.

Wedges. Ten wedges were found on the harbour, nine in heap A and one in heap D. Of these, two wide, thin wedges were each made from slivers of whale ribs, one of them being the wedge found in heap D. Seven were made of antler and one of bone. Those made of whale ribs and two of antler are large. Two broken antler wedges are of medium size. Two other broken specimens of antler were apparently small and one whole specimen is small, as is also the one of bone.

Of the two wide, thin wedges, each made of a sliver of a whale rib, the first (Plate XVI, figure 1) is sharpened on both edges, but only near the lower end which decreases in width towards the wedge edge. The edges at the sides are somewhat smoothed. The top is battered and slivered, apparently from use. The slivered surface is not smoothed as if the wedge had been much used, but the side illustrated is smooth. The similar wedge found in heap D was also apparently made of a large sliver of a whale rib, and is slightly cut on the broken surface and on the edges to bring it to wedge shape. It was also battered on the top.

Two large wedges were made of round prongs of antler, apparently of the moose. The first (figure 2) is smooth on the larger end, having apparently been neatly trimmed. The other end is broken off at the tip, leaving the specimen about 8 inches long, but shows that it was cut off at a bevel tangent to the concave side of the antler, which, if continued in the same direction on the missing part, would make the entire wedge about 9 inches long. Cutting off this side of the antler would make the wedge as straight as possible; cutting off either edge would leave it with its natural curve; and cutting off the convex side would tend to make it as curved as possible. The other specimen differs only in a few particulars. It was cut around the larger end and broken off. The small jagged projections are not crushed by blows such as must have been delivered had the wedge been driven. The other end is broken off at the tip, leaving

the specimen about 7 inches long, but shows about 1 inch of the part where it was cut off at a bevel tangent to the concave side of the wedge, which must have been about 8½ inches long.

The two medium-sized wedges are of antler, only a little smaller in diameter, and apparently of the deer. They are much battered, and the tissue is crushed in on one end as if that end had been the head of the wedge; the part of the opposite end that would indicate whether they were wedge-shaped or not is missing. A fragment of a wedge, probably small, made of antler, is narrowed from both edges and thinned from both sides to a narrow wedge-shape, but the other end is lacking.

A small prong of antler (figure 3) was whittled or scraped on both sides to a wedge-shaped point, the tip of which is broken off and missing. It was battered on the other end until the cells of antler were much crushed. The one shown in figure 5 is made of antler, apparently of deer, and was probably small. It lacks the upper end and is bevelled off from both sides.

The wedge made of bone (figure 4) was cut longitudinally from a large, thick bone by grooving and breaking. It is rounded off from both sides to a wedge edge, but the extreme tip is broken off. The other end is chipped on both sides. The specimen somewhat resembles the base of a broken simple point made of bone, and may be such, but the sharpening of the edge and the chipping at the upper end make it seem more likely to be a wedge or chisel.

The heads of some of the stone celts, as mentioned on page 48, are battered and fractured as if from use as wedges.

Chisels of Bone. Only the one object made of bone, above described as a wedge (Plate XVI, figure 4), resembles a chisel. This may have been used in wood working.

Pins of Antler. Only one pin-shaped object of antler, none of bone or shell, and no cylinders or tubes of any material were found on the harbour. The pin-shaped piece of antler found in heap A (Plate XVI, figure 6) was brought to a nearly cylindrical form, with one end nearly flat and the cells there compressed from being pounded. Slivers were broken off at the edge. The other end is slightly smaller and so bluntly pointed as to be nearly dome-shaped. It, too, shows longitudinal compression of the cells, as if from being held against something while the other end was pounded, possibly in chipping stone by percussion. Although only one of these was found on this harbour, in other places cylinders closely resembling it are common, for instance in Kentucky[1], Ohio[2], and southern Ontario.

Knives. Besides the chipped points, some of which are supposed to have been used as knives in the preparation of food, objects considered to be knives were made from incisor teeth of the beaver and woodchuck, and of copper.

Knives Made from Beaver Teeth. Fifty-three objects considered to be carving knives, made from incisor teeth of the beaver, were found in the heaps on Merigomish harbour. There were also six similar specimens made of incisor teeth of the woodchuck. Twenty-four knives made

[1] Cf. Smith (a), p. 198.
[2] Cf. Mills (b), p. 65.

from lower and four made from upper incisors of the beaver, and one made from an upper incisor of a woodchuck were found in heap A; sixteen made from lower incisors and three from upper incisors of the beaver, and one from a lower and four from upper incisors of the woodchuck in heap D; one made from a lower incisor of a beaver in heap K and another in heap L; two made from lower and one from an upper incisor of the beaver in heap M; and one made of an upper incisor of a beaver in heap N.

The use of such material for carving knives may well have been suggested by the similar use which these animals, especially the beaver, naturally make of their teeth. The hardness of the teeth eminently fits them for it. There are apparently several kinds of these objects, some of which may not be knives, although they probably fall within this category; for the artificially sharpened edge in all cases could have been made to serve in cutting, planing, or scraping. There are several kinds made from simple lower incisor teeth; first, those with the natural cutting edge slightly sharpened artificially, some with the root end cut off, and one of these with the back surface of the tooth ground; second, those with the inner canal of the tooth laid open from the back or concave side of the tooth; third, those with the tip of the cutting edge cut squarely across; fourth, those with the outer side of the tooth at the cutting end ground off at a slant from side to side, some of which are sharpened by grinding off the corner of this side of the tooth, fifth, longitudinal sections or whole teeth rubbed on the inner flat side. The following groups are made of upper incisors; first, those with the inner side cut off; second, those with the outer side at the cutting end rubbed down at a slant; and third, longitudinal sections rubbed on the broken surface.

Of the first groups, five lower incisors from heap A have about half the root end cut off and the natural cutting edge artificially sharpened. One of them (Plate XVI, figure 8) is remarkable for having a part of the front or convex side of the tooth worn entirely through the enamel, apparently by use. The method of cutting off the root end is described on page 70 and illustrated on Plate XVIII, figure 14. It was then probably smoothed on a grindstone. A sixth (Plate XVI, figure 9) and one from heap D are shorter still. Two other long specimens from heap A are broken across the root end, but the cutting end is sharpened back for over half an inch, on one of them to a convex surface. Of three from heap D, two are sharpened convexly. Another from this heap is made from the lower incisor of a woodchuck and is both convexly and bluntly sharpened. One (figure 10) has the back or concave side of the tooth rubbed and the root end has been severed and rubbed down at a slant, so that this side of the object is now convex from end to end. In all there are nine of this kind from heap A and four from heap D, not counting the one made from a woodchuck tooth.

One small piece of an incisor of a beaver is cut off across the base by grooving and breaking, the method apparently used where more was removed than could readily be ground down on a whetstone. Such grooved and broken lower incisors of the beaver have been found in Kentucky[1]. After being cut off by grooving and breaking, they were probably ground smooth on a whetstone.

[1]Cf. Smith, p. 199.

Of the second group, one short specimen broken at the root end is sharpened and the rear edge of the entire piece is cut off (figure 11). It might be considered as a fourteenth of the first group previously mentioned. Two more, from heap A, one of which is shown in figure 12, are also broken at the root end and have the back or concave part of the tooth cut away, opening the inner canal of the tooth the full length of the specimens. One from heap D, cut off $1\frac{1}{4}$ inches from the edge, similarly lacks the back part of the tooth. Another from the same heap is broken at about the same distance. The rear half of the tooth is broken away and one edge of this broken surface, except near the cutting edge, is sharpened. Some such knives found in Kentucky[1] have part of the inner surface grooved out longitudinally or cut off flat.

Of the third group, four from heap A have both the root and edge cut squarely across. A short one is shown in figure 13. Another short one from heap A (figure 14) has the edge cut squarely across, and the front and side of the broken root end ground to a rounded surface. Still another short one from heap A is broken off at the root end. A longitudinal fragment from heap D is possibly of this style, as the cutting edge is cut off. This makes six, possibly seven, of this style. The square tips of all these were probably ground off on a whetstone.

Of the fourth group, three found in heap A, one of which is illustrated in figure 15, and one found in heap M, are broken off, worn smooth on the broken tips at one end, and sharpened by grinding down the outer side of the tooth at a slant at the other end, so that it would form an excellent knife edge. A point broken from a specimen found in heap D is apparently of the same kind. Another from the same heap has both ends broken off. A third of this style from that heap is cut off at the root end with the cutting edge formed by rubbing the sloping outer side of the tooth at the natural cutting end. Still another, broken at both ends, is sharpened at the cutting edge, so that the missing part of the point must have been thicker than the thinnest part of the present object; another specimen (figure 16) is bevelled diagonally across the whole root end, showing the open canal of the interior of the tooth, so that this end resembles the cutting edge of a natural incisor of a beaver. The cutting edge is broken off, but shows a bevelled surface on one side of the tooth, which suggests that this specimen is of the same style as those here mentioned. A long specimen (figure 17) is broken off at the root end and ground off on the outer side into two scallops, one covering about half the specimen and about as high at one end as at the other, the other on the lower half of the tooth where the side tapers to form a sharp point. Still another from this heap is a longitudinal section lacking both ends and the inner edge, but it is rubbed along the front or convex face of the tooth, forming a slightly scalloped sharp edge. Another (figure 18), broken at one end, has the wall of the flattened inner side of the tooth removed, and is ground to a triangular point across the broken edges at the other end. A similar specimen was found in heap L. The inner canal of the tooth is opened the entire length of the specimen. A specimen of the same kind sharpened at both ends was found in heap K, and a fragment of the cutting edge of one found in heap M was sharpened

[1] Cf. Smith, p. 198.

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[1] Cf. Smith, p. 198.

so that the bevelled part only narrowed the natural cutting edge of the tooth. Some of the upper incisors, as mentioned on page 58, are also sharpened at an angle on the cutting edge.

Of the fifth group, one (figure 19) is a longitudinal part of a tooth, sharpened about half its length from the root end, concavely on the front edge and convexly on the rear edge, and cut off across the natural cutting edge and also at the root end in a way that makes it match the other end as to both square tip and bevel. The root end is like that of the specimens in figure 16, and the cutting end like the one in figure 13. The specimen in figure 20 shows the inner side of a natural lower incisor of a beaver, except that from a point about a quarter of an inch from the natural cutting edge to one an inch from the root end, it has been rubbed down slightly more deeply in the middle so as to form a sharp angle with the outer or convex face of the tooth.

One specimen from heap A is broken off at both ends, but is a longitudinal part, and is rubbed on the whole length of the artificial surface (figure 21). Another longitudinal piece from heap D lacks both ends, but shows rubbing on the section and a sharp corner where it meets the front or convex face of the tooth.

Of the first group made of upper incisors, one of a beaver (figure 22) is broken off at the root end, gouged out at the cutting edge for about a quarter of an inch, and has the back or concave side of the tooth cut back the entire length of the object. The incisor in figure 23 has the back or concave wall removed from the root end to within less than a quarter of an inch of the natural cutting edge, exposing the natural canal of the tooth for over half the length of the object. The bevel of the natural cutting edge has been slightly smoothed.

Of the second group, two upper incisors found in heap A lack part of the root end and are sharpened like others of this group made of lower incisors. One of this style is illustrated in figure 24, and one much like it was found in heap D. A piece found in heap M is broken off at both ends, but shows that the natural canal of the tooth was opened and that the grinding at one end of the canal did not taper off to form a sharp point. The grinding was concave in the tooth at this point, so that the tooth was left larger on either side of it. Two objects of this general style were found that were made of the upper incisors of the woodchuck, one (figure 25) in heap A and the other in heap D.

Of the third group, an upper incisor of a beaver (figure 26) is a longitudinal piece of the tooth with part of the root end and all the inner or concave side of the section lacking, and is slightly rubbed on the whole length of the front or convex edge of the irregular artificial surface, except at the natural cutting edge. Less than a longitudinal half of an upper incisor, rubbed flat on the artificial surface and lacking part of the root end (figure 27), and a fragment about an inch long of the natural cutting edge end of a similar specimen, were also found in heap D.

Artificially sharpened incisors of the beaver, supposedly used as knives, have been found among prehistoric remains in many places. Loomis found them in a heap in Maine[1]. Specimens from a shell-heap in that state

[1] Cf. Loomis, Fig. 5.

may be seen in the Peabody Museum, Cambridge, Mass., and others from the refuse of a prehistoric Iroquoian site near Roebuck, Ontario, in the National Museum of Canada, Ottawa. Some from the coast in the vicinity of New York city,[1] and from Mayslick, Kentucky[2], are in the American Museum of Natural History, New York.

All these objects made from incisor teeth of the beaver and woodchuck may have been used as carving knives for wood working. Such knives, hafted in wooden handles, are used like chisels in making snowshoes and also as crooked knives by the eastern Cree[3]. The specimens found on this harbour were probably hafted in handles, possibly like the one made of antler still holding a cross-section of an incisor of a beaver, which was found at Bocabec, New Brunswick (Plate XX, figure 6, Cat. No. 327 in the Patterson collection). The tooth is set in a hole through the end of the handle, so that the natural cutting edge is in line with the axis of the handle; but this edge is broken off and lacking. The lower surface of the handle, from which the cutting end of the tooth projects, is flat; the upper surface is made up of two long, curved surfaces that fit well in the bend of the fingers if the handle is held flat side to the thumb and the knife drawn towards the user, as is customary in the region. The Micmacs, since first known by white men, have used exclusively for wood working a knife which they always draw towards them. As to shape, this knife handle may be compared with those from Micmac Indians (Plate XXI, figure 4). It will be noted that both have a curve at the top with a flat surface for the thumb on the convex edge of this top part. An incisor tooth of a beaver, hafted in a transverse hole in a piece of antler with the cutting edge of the tooth in line with the axis of the handle, from Prince Edward county, is in the Chadd collection in the Provincial Museum, Toronto, Ontario, and a handle of antler from the Roebuck site, with a longitudinal excavation in one side of one end of suitable curve and size to hold a lower incisor of a beaver, is in the National Museum of Canada.

Knives made of bone are referred to by Denys[4] as having been used. Though these may have been of bone, like the five lance-shaped points found at Merigomish (Plate V, figures 18, 19), it seems probable that he used the word "bone" for tooth and really referred to knives similar to those above described.

Knives Made of Stone. Sharp chips and flakes of stone (Plate III, figures 5, 6) and chipped points may have been used occasionally as knives. The edge of the left end of the object chipped from metargillite (Plate XVI, figure 7) is rubbed smooth, possibly from such use. Scrapers chipped from stone (Plate XVII, figures 1, 2) may have been used as knives for whittling, planing, and scraping.

Knives Made of Copper. A small, thin knife-blade of copper from the prehistoric cemetery is Cat. No. 34169 in the United States National Museum, Washington, D.C.; three knives made of copper are listed in the catalogue of the Patterson collection as found in the same cemetery,

[1] Cf. Skinner (b), p. 230.
[2] Cf. Smith, p. 198.
[3] Cf. Skinner (a), p. 52.
[4] Cf. Piers (a), p. 112.

and Patterson states (a, p. 235; b, p. 30) that he believes more copper knives have been found in this cemetery than in all the rest of Nova Scotia. The two pieces of copper found on Merigomish harbour (Plate VII, figures 3, 4) do not appear to be suitably shaped for such use.

Rough, knife-shaped objects, made of native copper from the trap of the bay of Fundy, have been found at Backman beach, Lunenburg county, Nova Scotia, according to Piers (a, p. 116) and Patterson (c, p. 676). Among eighteen specimens of copper from Backman beach, in the Provincial Museum at Halifax, two, Cat. Nos. 75f and j, are certainly small knives.

Knife Cuts. Stone objects bearing cuts that may have been made with these several kinds of knives have been found (Plate XVIII, figures 1, 2, and Plate XIX, figures 4, 14, 15); and objects of pottery (Plate IX, figure 5); of bone (Plate XVIII, figures 3-9, and Plate XIX, figures 16, 17); of antler (Plate XVIII, figure 11, and Plate XIX, figures 18-20); and of teeth (Plate XVIII, figures 12-15).

TOOLS USED BY WOMEN

Tools supposed to have been used by women, other than those employed in the preparation of food, include scrapers, awls, and needles (Plate XVII).

Scrapers Chipped Out of Stone. Eleven scrapers chipped from siliceous stone were found in heap D, one in heap E, and eight in heap A. Of these, five from heap A and seven from heap D (figure 2) were chipped from white quartzite pebbles, all but two showing part of the natural surface of the pebble. The other eight are of jasper, chert, and chalcedony. A few are rubbed smooth across the edge, as are the much larger chipped stone scrapers of the west, which are known to be used for scraping skins. This smoothness of the edge is not perceptible, however, on any made of white quartzite.

The method of manufacture of these scrapers chipped out of stone is suggested by a few specimens. Many small, broken pebbles of white quartzite were found in heaps A, D, and M, that apparently were broken to obtain material, chiefly for scrapers, as only a few points for arrows chipped from this material were found. The manufacture, so far as this raw material, tools, and waste is concerned, is the same as that of arrow points, which has been discussed on page 22. A few angular pieces of jasper eroded on the surface were also found, although none of the eight scrapers chipped from jasper, chert, and chalcedony, shows any part of a natural pebble surface, and they may all be chipped from bedrock material. All such pebbles would have lost their quarry water. Indians in the southern interior of British Columbia prefer to get material for chipping from a quarry, and state that weathered material is not good. As the people of Merigomish harbour chipped many pebbles of quartzite and some weathered jasper, perhaps all the scrapers were chipped from pebbles or at least from weathered stone. In this case the material may all have been obtained locally

in the drift. Very few chips of jasper were found. The manufacture of scrapers from jasper would be similar to that of scrapers from quartzite, as indicated on page 23.

All these typical scrapers may have been fastened to a handle, as were the similarly shaped, chipped scrapers used until recently by the Indians of the Plains for scraping skins, or they may have been inserted in the split end of a stick which was used as a handle, as are the large ones employed as skin scrapers in the far west. They may also have been used as knives for whittling, planing, and scraping.

Scrapers Made of Bone. Scrapers or fragments of scrapers made from bone were not recognized, although the long bone objects that had been grooved and broken (Plate XVIII, figures 4-6) resemble the scrapers made of bone that are used on the long edges instead of on the end. Specimens of this type, known in the interior of British Columbia to have been used as skin scrapers, are common in Ohio and Kentucky, where they are usually made from the metatarsal bone of the deer. One made from a metapodial bone of a caribou, with the side cut out, was found about 2 inches deep in a Beothuk wigwam site on Badgers brook, Newfoundland, by Frank G. Speck, and is catalogued as No. VIII-A-7 in the National Museum of Canada. Speck collected a similar specimen from the Micmacs of Newfoundland. It is catalogued as No. III-F-162. Another, which he collected from Micmacs of the same place, Cat. No. III-F-161, is made by sharpening the edge of the radius of a united radius and ulna of a caribou. One made of a metapodial bone and a large one made from a combined radius and ulna wound at the ends with cloth, have been collected from the Montagnais and Ojibwa. The Naskapi of Labrador[1] scrape the loosened hair from skins with scrapers, somewhat like a spoke-shave, made from the metatarsus of the caribou. They are made by cutting a slice from the middle part of the back of the bone so as to make a sharp edge, and the untouched ends serve for handles. Metapodial bones of the elk and shoulder blades of both deer and elk were used for this purpose in Ohio.

The bone object, Plate VII, figure 12, has the lower end rounded in outline, and on the reverse the bone is cut down at a bevel to this rounded edge. It is worn across this bevelled edge as if from scraping some yielding material such as skin, and it may be a fragment of a chisel-shaped skin-scraper similar to those now used by the Micmacs. The rest of the outline of the bone is broken, apparently accidentally. It has faint, transverse, parallel marks or grooves across the obverse surface, which may be from the decay of the bone along the line of winding material or in the spaces between it. The winding, however, would have come so close to the edge that the object could not have been used as a skin-scraper. The long, broken side edge is worn on the convex side, and the opposite side of this edge is sharply broken.

Awls. Awls made of bone were among the common finds on the harbour, and two objects were found which, though made of copper, may also have been used as awls. Eighty-seven awls made of bone were found in heap A, nine in heap D, and one, presumably, in heap B; according

[1] Cf. Turner, Figs. 102–103, p. 292.

to the catalogue of the Patterson collection, four were found on the Millar farm, and two, made of ivory, on the harbour, making a total of one hundred and three (Plate XVII, figures 3-16).

Awls were probably used in making holes in moose skin and similar material employed for moccasins and other garments. Some may have been used in making baskets, weaving nets, netting snowshoes, or decorating pottery. Some are similar to awl-like objects used by the modern Micmac Indians as snowshoe mesh punchers. Some were probably used as tines of forks for the preparation or eating of food, as was mentioned on page 36. Some of them, especially the long ones, may have been used as harpoon points or daggers in hunting or warfare, and the smaller specimens may have served as points for arrows, fish-hooks, or barbs for large hooks. Possibly the notches on the specimen shown on Plate XIX, figure 16, considered to be for decorative purposes, were intended to facilitate fastening this pointed bone to a handle or fish-hook. On the other hand some of the points made of bone, considered to have been for arrows, spears, daggers, fish-hooks, and barbs, may have been for awls. Some may have been used for several purposes. The points of some are polished by use.

Forty-one from heap A and two from heap D are made from pieces of thick-walled bones, some from the metapodial bones of the deer. Eleven are complete. Eighteen show a joint end of the bone, which would form a convenient handle; ten more have the base broken away, so that possibly twenty-eight had this feature. Two lack both point and base, and twelve show only the points. Nineteen of them show signs of having been cut out by longitudinal grooving and breaking. One of these (Plate XIX, figure 16) bears incised lines, which are discussed on page 84.

Twenty-three, the next greatest number of awls, are made of long bones of birds. All these are from heap A. Eleven are sharpened across the hollow bone to form a point (Plate XVII, figures 11, 14). Only two of these (figure 14) retain a joint end of the bone, which forms a convenient handle. The other twelve awls, made of long bones of birds, are sharpened pieces or splinters of such bones (figure 13).

Twenty-three awls are made of large splint bones, probably of the moose. Sixteen of these are from heap A, six from heap D, and one from heap B. Eleven retain the joint of the bone, probably as a handle. The joint end of the remaining twelve is broken off and missing. This is the exact type of objects that, among the modern Micmacs, are lashed together to form the forks mentioned on page 36 (Plate XXI, figure 3).

Six awls were made of ulnæ, two of the fox, one of the raccoon, and two of the deer. Two of the fox-bone awls are from heap A, and that of the raccoon is from heap D. The joint end would serve well as a handle. Two made of deer ulnæ are only broken points, but no doubt in these also the joint end served as a handle. Ulnæ were also found in their unsharpened natural condition, and it would seem that such a natural bone could be made into an awl in a few moments by rubbing it into shape on a piece of sandstone. One of these awls, made of the ulna of a raccoon, is illustrated on Plate XVII, figure 16. One awl was made of a fish spine (figure 12).

Two objects, made of copper, that may have been used as awls, have been considered as possibly points for arrows or barbs. The first (Plate

VII, figure 3) may be a needle; the second (figure 4) may be a needle in process of manufacture. Six "piercers", rectangular in cross-section, pointed at both ends, and $\frac{3}{4}$ inch to $1\frac{1}{2}$ inches long, made of native copper from the trap of the bay of Fundy, have been found at Backman beach[1] (Cat. No. 75 in the Provincial Museum, Halifax). An awl made of copper was found at Chester Basin, Lunenburg county, and is in the Provincial Museum; another, square in cross-section, but pointed at both ends, was collected by Mr. C. H. Mills from a shell-heap at cape d'Or.

Needles. No very fine needles were seen, but about twenty fragments of objects made of rather thin-walled bone, which appear to have been coarse needles, were found in heap A (Plate XVII, figures 17-20). According to the catalogue of the Patterson collection, a needle made of bone was found on the Millar farm. The object made of copper, considered as possibly a point for an arrow, a barb, or an awl (Plate VII, figure 3), may have been a needle, as it has a sharp conoid point, a somewhat rectangular shaft, and a split base, which may be an opened-up eye. The other object (figure 4), considered as a point for an arrow, a barb, or an awl, may have been a needle in process of manufacture.

The needle-like objects made of bone were found only in heap A, which was the largest, and yielded the most material. Six pieces show that the entire object had at least one eye, and two of them show that they were parts of objects with at least two perforations. These six seem surely to have been needles. Two of those with a single eye are pointed, as are nine of the twenty pieces. But all these nine points may be bases. The perforations were not drilled, but gouged from both sides of the object, and are longitudinal in at least four of the six specimens showing perforations, and probably were also in the other two. Three of these six, including one with evidence of at least two perforations, were lenticular in section (Plate XVII, figure 18). Two (figures 17 and 19) are somewhat lath-shaped, with slightly rounded corners. Another—the second, with evidence of two perforations—(figure 20), is flatter on one side than on the other and has rounded edges. It may have been lenticular in section towards the point. Three other pieces without signs of perforations have points of lenticular section, making a total of six with such sections. Eleven pieces without eyes are lath-shaped or nearly so, making a total of thirteen pieces of that shape. Those of lenticular section are more delicate than the others. Six of the longer pieces, three of lenticular section and three of lath shape, one of each kind having signs of one perforation, show that the object was slightly curved. This may be due to the natural warping of the bone, but it may be intentional and of service in certain kinds of sewing. One lath-shaped piece (figure 17) is of a point broken off along one edge of a perforation and has a little knob at the point made by whittling the sides and edges towards the point. The knob may have served, like a crochet-hook, to hold a thread, or it may represent an unfinished point. The eye in the specimen having an irregular section (figure 20) seems to be worn at the upper end of the perforation as if the thread or cord was always pulled back as in knotting. All or some of these objects

[1] Cf. Piers (a), p. 116; Piers (b), p. 288; Patterson (c), p. 676.

may have been used as snowshoe needles[1] similar to those made of wood, antler, and copper used by the modern Micmac Indians (Plate XXI, figure 5). No object recognized as a needle case was found.

Manufacture of Needles. The manufacture of needles from bone is illustrated by a few of the specimens. There were plenty of thin-walled bones suitable for the manufacture of needles by incising with a flake of stone or a chipped point (Plate III, figures 6, 10) and breaking (Plate XVIII, figures 3-6). These pieces could be whittled into shape with the same tools or with knives made from beaver teeth (Plate XVI, figures 8-27). Such whittling may be seen on the point of the specimen (Plate XVII, figure 17). They could be smoothed on whetstones (Plate XV). One (Plate XVII, figure 18) was not only smoothed, but appears to have been polished by use or handling, or both. The perforating could have been done with a flake of stone, or a chipped point, or with a knife made of a beaver tooth, especially one of those sharpened to a point (Plate XVI, figures 18, 24).

Tools for Spinning and Weaving. No objects supposed to have served in spinning and weaving were found, and the only evidence of spinning is the occurrence of impressions of twisted cord on pottery (Plate XI, figures 1-12), which may have been made without the use of a whorl. The only evidence of woven fabric found is illustrated on Plate IX, figure 6, Plate X, figure 24, and Plate XI, figure 13.

PROBLEMATICAL OBJECTS

Several classes of objects were found, that have not been classified. There are four specimens apparently of similar objects. One, made of a curved rib bone sharpened at both ends (Plate VII, figure 9), is like a west coast bark peeler. On the reverse it has been cut off nearly flat in a way that exposes the cellular structure of the bone. A point broken from an object, apparently the same as this, made of a bone from a sea mammal, was also found in the same heap. The sides are flat and on the obverse the cells of bone are cut across. It is slightly curved sidewise. A point broken from a similar large object made of antler or close-grained bone of some large sea animal was found in heap M. It is about an inch wide by half an inch thick, with a conoid point grading into flat sides and edges with rounded corners. It is slightly curved, and may be a fragment of an object similar to the one shown in figure 9. An end fragment of an implement made of antler (figure 10) was found in heap M. Although part of a larger object than those above described, it may be of one used for the same purpose.

A fragment of a large object of unknown use, made of whale rib (figure 13), has one side cut off, exposing the cellular structure of the bone; the other side shows only the natural surface of the bone. The upper end is broken off diagonally; the lower has been hacked around and then broken. At the upper end the edges are flattened by hacking. At the lower end, one edge is sharp and the other rounded, like a handle. There is purplish red paint on the obverse of the upper end.

[1] Cf. Turner, Fig. 130.

Nineteen objects resembling each other and of unknown use were also found. Eighteen of them (Plate VII, figures 6-8) are made of bone, and the other (figure 5) is made from a canine tooth. Of these, eleven are small and are all practically alike. The remaining eight are large specimens but vary in size, and two differ considerably from the others in shape. Four of the small and three of the large specimens are from heap A; six small and two large ones from heap D; one large one from heap K; two large ones from heap M; and one small specimen from the eastern part of heap N.

Of the four small specimens found in heap A, only one is entire (figure 7). It is $1\frac{1}{4}$ inches long, oval in cross-section, and tapers towards the ends, with one-half curved edgewise. The small ends are cut nearly square across, the straight end having a small, symmetrical knob and the curved end a knob projecting only on one side. The other three specimens from this heap are similar, except that one lacks the knobbed part of the straight end, another the other end, the third both ends, and that in all the curve is slightly greater. Of the six small specimens from heap D, three are like those above described, but lack both ends; another lacks the tip of the curved end, and the fifth, which is thin and rather flat, with rounded edges, lacks one end and has the other end, though slightly knobbed, enlarging so gradually and irregularly that it is impossible to determine whether it is knobbed all around or only on one side. Besides, it is nearly straight on one edge and convex on the other, so that neither end can be positively identified as a curved end or a straight end. The sixth specimen (figure 5) is $1\frac{1}{8}$ inches long, apparently made of a canine tooth, and is of the type described, except that the curved end is somewhat flattened on the edges rather than oval in cross-section and that it has a notch in each side instead of a knob on one side. The specimen illustrated in figure 6 is of the type form, but has a rather slender and more curved end.

In these small specimens the projection on the curved end is confined to one side, and to the same side in three out of the five cases where the end is not lacking—two from heap A and one from heap N—whereas one from heap D is indefinite and the other (figure 5) has a notch in each side. This seems to prove intention rather than accident.

The eight large specimens are broken. One (figure 8) is nearly of the type form but over $1\frac{1}{2}$ inches long. Instead of one end being curved, one edge is slightly more convex than the other and curves off towards it. The tip is lacking, so that it cannot be told whether it was knobbed on one side, notched on both sides, or otherwise. The second specimen is similar, except that the end of the knob is broken off rather than cut square across; the other end has the tip broken off, but, unlike all the above-mentioned, it curves towards the more convex side of the object. The end edge of this neck is broken rather than cut. Of the two large specimens from heap D, one seems to be of the type form with both ends lacking; it has a very curved neck and is nearly uniform in section throughout. The other is oval in section, and somewhat like the base end of a simple point with one edge cut to resemble the end of a crochet-hook, but without any undercut to the hook. Of the two large specimens from heap M the largest, though lacking both ends, is $2\frac{1}{2}$ inches long. Its edges are nearly symmetrical, and the neck is elongated but curves very slightly

towards the more convex edge of the object. The other specimen, $1\frac{5}{8}$ inches long, is slender and lacks both ends. The curved neck turns up well towards the more convex edge instead of towards the other. The specimen from heap K is of the same length but heavier, lacks both ends, and has the neck turned towards the less convex edge. What is probably an unfinished specimen of this type consists of a piece of bone with one end rubbed until oval in cross-section and tapering slightly. On one edge near the end of this worked part is a deep, sloping cut with rounded edges, corresponding to the more convex side of the finished objects. The shape of the part below the cut and the presence of a break suggests that this end had been longer and curved as in the other examples.

Five somewhat similar objects made of stone, but practically symmetrical around the axis, found in New Brunswick, are in the Museum of the Natural History Society of New Brunswick at St. John, catalogued under No. 128. The first, collected on French island, French lake, is made of red catlinite, and the surface is whittled. It is grooved around both ends, and one end tapers more rapidly than the other.

It has been suggested that these may have been tied end to end to make a necklace, but for such a purpose one would expect the object to be symmetrical instead of with one end longer than the other. Those found on Merigomish harbour also have one end differently shaped from the other, and differently knobbed. They may have been hung, like claws, on a necklace. They are apparently much too light for sinkers, especially in tidal or deep waters; but might have been used for artificial bait for very small fish, or as shuttles or net needles, as mentioned on pages 35 and 20.

A slender object made of slate, which tapers to a blunt point, is illustrated on Plate XX, figure 3. In section it is nearly square and a little over a quarter of an inch in greatest width. It is $3\frac{1}{4}$ inches long, although part of the larger end is missing. Patterson stated that he has seen nothing similar to it (a, pages 234-235).

PROCESSES OF MANUFACTURE

The processes employed in making the various objects found or indicated by finds on the harbour comprise rubbing, breaking, cutting, cutting and breaking, perforating, punching, chipping, flaking, pecking, modelling, impressing, twisting, weaving, and painting, but not drilling or knitting. These processes may each be illustrated by a series of specimens selected from the objects found.

Rubbing. Practically all the objects formed by pecking, and some of those formed by chipping, were finished by rubbing, grinding, or polishing, and many objects were made in these ways. Rough grinding was no doubt done with coarse grindstones, like those described on page 54 (Plate XV, figure 1). Finer grinding or polishing was probably done with finer grinding stones (figure 3) and perhaps by rubbing with the hand, horsetail scouring rush, or other fine material.

The results of this process are shown, among objects made of stone: on celts (Plates XII and XIII), hammerstones (Plate XIV, figures 2, 3, 7-9), and red paint (Plate XIX, figures 1-4); among those of bone: on points (Plate V, figures 1-21), harpoons (Plate VI, and Plate VII, figures 1, 2), on problematical objects (Plate VII, figures 6-8, 9-11), on wedges (Plate XVI, figures 1, 4), on awls (Plate XVII, figures 3-16), on needles (Plate XVII, figures 17-20); among objects of antler: on wedges (Plate XVI, figures 2, 3, 5), on a pin-shaped object (Plate XVI, figure 6), and on other objects (Plate XIX, figures 18-20); and among those of teeth: on a point made of a shark's tooth (Plate V, figure 22), on a peculiar object (Plate VII, figure 5), on knives of beaver and woodchuck teeth (Plate XVI, figures 8-27), on a molar of a beaver with root end ground to a conoid form (Plate XVIII, figure 16), on a pendant made of a bear canine (Plate XIX, figure 7), and on an incisor of a moose with root wedge-shaped (figure 9).

Some of the knives made of the lower incisors of the beaver are sharpened on the lower part of the naturally bevelled cutting edge by transverse rubbing, the striations of which are not all parallel. The pendant made by perforating a bear canine (Plate XIX, figure 7) has four parallel grooves across the enamel of one side. The groove towards the root of the tooth is deeper than the other three, which are of about the same size. On the reverse are a number of very small, parallel grooves. None of these seems to be cut or ground, but rather worn with something soft, like a cord. The incisor of the moose (figure 9) which has the root ground off on the sides, bringing it to a wedge shape, was ground diagonally, but nearly lengthwise of the tooth, as shown by rather coarse striations. These striations are not parallel.

Breaking. Some long bones had been broken lengthwise, as if to get material of suitable size for making implements. Many pieces of bone and a few of stone, antler, beaver teeth, and ivory were broken after being partly cut through, also apparently in getting material or making objects. Specimens of this process in stone are illustrated on Plate XIX, figure 14, and Plate XVIII, figures 1, 2; in bone on Plate XVIII, figures 4-6, 9; in antler on Plate XVIII, figure 11; in a beaver tooth on Plate XVIII, figure 14; and in ivory on Plate XVIII, figure 12.

Cutting. Cutting was, probably, done with flakes of stone and with knives and scrapers chipped from stone, beaten out of copper, and made of beaver and woodchuck teeth. Many flakes suitable for use in cutting were found (Plate III, figures 5, 6). Chipped points may have been used as knives (Plate III, figures 9-15, and Plate IV, figures 1-20). Scrapers chipped from stone may have been used to whittle, plane, or scrape (Plate XVII, figures 1, 2). Four knives beaten out of copper were collected on the harbour by Patterson. The writer collected fifty-three objects considered to be knives, made from beaver teeth (Plate XVI, figures 8-24, 26, 27) and six woodchuck teeth (Plate XVI, figure 25).

The products from this process are shown by cuts on objects of the following materials: stone (Plate XVIII, figures 1, 2, and Plate XIX, figures 4, 14, 15); pottery (Plate IX, figure 5, and Plate X, figure 11); bone (Plate VI, figure 20, Plate XVIII, figures 3-9, and Plate XIX, figures 16, 17); antler (Plate XVIII, figure 11, and Plate XIX, figures 18-20);

shark's tooth (Plate V, figure 22); ivory (Plate XVIII, figures 12, 13); beaver incisor (Plate XVIII, figure 14); and bear canine (Plate XVIII, figure 15).

The specimen of antler (Plate XVIII, figure 11) is whittled to a point as well as cut at its base. A piece of antler, about 2 inches long by 1½ inches wide and 1 inch thick, apparently of a deer, found in heap D, and, though somewhat decayed, apparently cut around and broken off at both ends, is whittled on part of one edge and shows whittling scars such as would be made with a chisel the size of those made of beaver teeth (Plate XVI, figure 8).

Cutting and Breaking. Cutting or grooving, followed by breaking, was the process by means of which pieces suitable for use were often cut from stone, bone, teeth, and walrus ivory. Stone was so cut by making two incisions opposite each other, one on each side, and breaking along the line of incisions, as is illustrated by five specimens. The first, a flat slate pebble (Plate XVIII, figure 1), shows, along the straightest side edge, where it was grooved about a third of the way through on each side and a piece broken off. On the lower portion of the edge the broken part projected and was ground off, but on more than half of the upper part of the edge the break cut into the centre of the edge between the grooves and the grinding has not obliterated this sunken, broken surface. The specimen has a longitudinal, incised groove, nearly the length of the left edge and running off from it at a slight angle. The surface of the stone near this groove and to the nearest edge is scratched by incisions parallel in a general way with the edge and the groove. This may be a piece in process of manufacture, or one cut off to trim a slate pebble to shape for some object.

An incised and cut greenish grey slate pebble (Plate XIX, figure 14) is flat, slightly over a quarter of an inch thick, and was apparently oval. One edge shows clearly where it was cut nearly half through by incising on each side, broken along the incisions, and the broken edge rubbed until, along about two-thirds its length, the signs of incising were obliterated. On one side, parallel with this cut edge, are two or more incised scratches which may have been caused by slips in making the incisions on this side. At right angles to these are two distinct and nearly parallel incised lines which may be the beginnings of further incising and breaking of the pebble.

A piece of slate (Plate XVIII, figure 2) was incised on the obverse about one-third of the way through from the two side edges and a short distance in from the lower end and then broken, leaving a raised broken surface on the middle third of this side. The incision is fresh looking and clearly striated, indicating a rapid sawing rather than a slow wearing. On the upper left side of the broken part the incising undercuts the broken surface, and may be seen to have had an acute bottom rather than one shaped like an inverted M, as is the case in cuts made with a set saw. The side edges, top, and bottom, are all broken surfaces, but the right side edge also shows a whittled or scraped surface, and a short strip on the left side of the bottom was incised apparently to facilitate breaking off that end. The reverse has been scraped. The piece, judging by the material and its size, appears to have been cut from a larger piece that was being made into some object, possibly a pipe. Another piece of slate from the same

heap is apparently of identical material, and, being about the same length, may have been cut from the same original piece. It is roughly rectangular in cross-section and measures about $\frac{3}{8}$ by $\frac{1}{4}$ of an inch. It shows on one side an incised surface over about half the area, and a broken surface over the rest. There is a similar surface on the adjacent side. The next side is smoothed or scraped and bears an incision running in from the edge, apparently where the grooving was started to cut that edge. The last side is a cut surface. The two ends are smoothed.

A piece of greenish sericite schist, about $1\frac{1}{4}$ inches square and $\frac{1}{2}$ inch thick, was found in heap A. One side is merely a broken surface which extends to the opposite side along one edge. The other side seems to have been cut to within about $\frac{1}{8}$ inch of the edge and broken the rest of the way. This cut surface bears about a dozen incisions across the grain of the incising, and the broken surface has been slightly smoothed. An adjacent edge was also cut nearly off, then broken, and the broken surface smoothed, or possibly made by cutting off a probable projection caused by breaking. Two other edges are cut or ground nearly flat.

Of specimens cut by this process more of bone than of stone were found, some cut longitudinally (Plate XVIII, figures 3-6), and one cut transversely (figure 9). A thin piece of bone (figure 3) has a longitudinal, incised groove near the middle of the lower half of the obverse side, but not opposite it on the reverse. Both top and bottom of the specimen are broken off and lacking, and the bone was broken off along the lower half of the part of the groove that remains. The right edge was cut off the entire length of the fragment by incising from the reverse side only and breaking. The breaking did not exactly follow the groove, as is shown by the ragged projection on the lower part of this edge. The left edge is sharpened by grinding.

A piece of a comparatively thin-walled, long bone (figure 4) was partly cut out by longitudinal grooving from the outside nearly through on each of the two side edges and was then detached by breaking along these grooves.

The piece of a metapodial bone of a moose (figure 5) shows longitudinal grooving on the front wall at the right and smoothing on the one at the left. It was no doubt partly cut out by grooving nearly through from the outside on both sides of the piece and then broken out along these grooves. In this case the grooved and broken edges were rubbed smooth, so that no signs of the grooving and breaking show except the grooving on the right, previously mentioned. One rear part of a metapodial bone of a moose (figure 6) shows where the natural bone was grooved nearly through on both sides and broken, apparently to get bone of suitable size for making such artifacts as harpoon points.

Smaller pieces of cut and broken bones, but possibly of other animals, were frequently found in heap A. Five show longitudinal grooving on the outer surface of the bone and breaking through to the marrow canal on one edge, and three pieces, two being of large bones, show this on both edges. The grooved surface, on one of the last three, shows innumerable small, parallel, transverse striations, too regular to be caused by the gnawing of a small rodent. Another of these three, broken off short, is grooved in the middle, but not yet broken through. It is so shaped that if it had not

been broken off it could be broken through along the grooving so that each piece would form suitable material for a point, harpoon, or awl. Longitudinal grooving and breaking show on a fragment of charred bone found in the refuse of the prehistoric cemetery. Three specimens from heap D are grooved and broken on one edge; two others, also, one of a large bone, show a groove not yet broken through. Another strip of bone from heap D is unusual in that it is cut along the whole side edge so that the angle of the cut edge with the surface of the marrow canal is sharp. This cut is at a bevel, is irregular, and shows two main cut surfaces. One piece of a long bone from heap A, having one side edge cut out by grooving and breaking, shows many cuts in several directions, but all trending across the outer surface of the bone.

Transverse incising may be seen on both sides of the blunt end of the piece of bone illustrated on Plate XVIII, figure 9. The bone was broken off along these incisions. Longitudinal chipping of the bone may be seen on the right edge, and the longitudinal grooving from the outside surface of the bone, by means of which this piece was cut out, shows on the reverse side of this same edge. The smooth surface on the left edge is apparently part of the groove by means of which the bone was nearly cut through, and the slight ridge at the right edge of this groove appears to be the part of the bone which had to be broken to complete the cutting out of the piece.

Hacking around and breaking off at the weakened place were the processes employed in cutting off the lower end of the object made of whale rib, which is considered on page 19 and is illustrated on Plate VII, figure 13. A large rib from heap A shows two old cross hacks on the inside of the bone where it is broken at one end, and six cross hacks on the outer side of the bone at the opposite end. Besides these, several insignificant specimens from heap D show cutting and whittling of the bone. An ulna of a moose, found in heap A, was cut about one-third the way through diagonally across at the small end and then broken off.

The piece of bone illustrated on Plate XVIII, figure 7, is given its acute point by incising about half-way through the bone from each side. Apparently the incisions met, and breaking was not necessary. The obverse side is smoothed by whittling, but no sign of artificial work appears on the reverse. The edges have been similarly incised or whittled. The lower end is smooth in one place, being either part of the naturally smooth end of the bone or a smoothed surface.

A tip of antler, illustrated on Plate XVIII, figure 11, was partly cut off by repeated hacking, with such a sharp object as a flake of stone, nearly all the way around it and deeply over a wide area of the concave edge of the antler. It was then broken from the rest of the antler. The tip was also somewhat sharpened by whittling.

A canine tooth of a bear with both ends broken off (Plate XVIII, figure 15) bears a slightly curved incised groove on one side. This side is somewhat chipped off and worn down. This groove may have been started with the intention of deepening it to cut the tooth in two.

Incisions show across both sides of the broken root end of the piece of a lower incisor of a beaver, illustrated on Plate XVIII, figure 14. This

suggests that grooving and breaking were the processes used in cutting off the teeth both of the beavers and woodchucks, in making the carving knives described on page 57.

The short piece of walrus ivory illustrated in figure 13 is grooved from two opposite sides, apparently preparatory to breaking it into two pieces. The two severed pieces would each have a surface similar to that shown in figure 12. It was grooved with an instrument that left a rather flat or wide-bottomed groove. The left side is apparently partly the natural surface of the tusk, partly whittled, and the lower part of it is chipped or broken away. The right side is also chipped or broken away. The upper end is battered, this battering probably accounting for part of the chipping on the sides. The piece of walrus ivory illustrated in figure 12 shows a surface made by longitudinal grooving more than a third of the way through the tusk on each side and breaking the remaining part of the ivory. The reverse is apparently the natural surface of the tusk, and the only other surface is broken across.

Drilling. Although there are holes, gouged out as with a knife, in several of the objects found here, drilling is not exemplified by anything which the writer found. No drills chipped from stone, or tubes suitable for hollow drills, were seen. The refuse from this process, except cores, is too minute to be determined. No results were found of drilling, either with a drill point chipped from stone, which leaves perforations tapering from the end from which it was drilled, or with a hollow drill, which makes a nearly straight-sided bore and in some cases leaves a core.

Perforating. Perforating was apparently done by gouging, with small or sharp-pointed specimens such as the knives described on pages 36, 57, and 61. No refuse from the process was found, so that it must have been very small. Holes, however, may be seen in the fragment of pottery illustrated on Plate IX, figure 5, in the bone harpoon points (Plate VI, figures 10-13), the bone needles (Plate XVII, figures 18-20), the pottery stamp or pendant made of bone or antler (Plate XIX, figure 19), in the pendants made of bear canines illustrated on Plate XIX, figures 5-7, or the pendant made of an incisor of a moose illustrated on Plate XIX, figure 8.

Punching. Punching was employed as a process, as is shown by the pits in some of the fragments of pottery pitted on the outside before firing (Plate X, figure 2, and Plate XI, figure 3).

Chipping. Chipping was the process by which points and scrapers were made of stone, and work on some celts was begun. A few pieces of bone, and a canine tooth of a bear, also show results of this process. Hammerstones (page 51 and Plate XIV) were probably the tools used for chipping. The one short, pin-shaped object made of antler, battered and splintered on one end, but dome-shaped on the other (page 57, and Plate XVI, figure 6), was possibly used with a hammer for chipping stone. If so, it was struck on the end instead of being used as a flaker with lateral pressure. Chips of stone, the refuse from this process, were common but not as numerous as in some places. Two are illustrated on Plate III, figures 5, 6. Chipping is seen on the unfinished or rejected chipped objects on Plate III, figures 7, 8, and on the chipped points in figures 10-15 and

on Plate IV, also on the edges of the scrapers on Plate XVII, figures 1, 2. Some of the celts were partly shaped by chipping before being ground, others before being pecked and ground. Longitudinal chipping may be seen on the right edge of the piece of bone described on page 71 and illustrated on Plate XVIII, figure 9. The canine of a bear (page 72 and figure 15) is somewhat chipped on one side. The chipping on a piece of walrus ivory (page 73 and figure 13) was probably done accidentally when it was being battered.

Chipped material in process of manufacture, in proportion to finished chipped objects, was not very common. The manufacture of chipped points by the process of chipping has been described on page 22 and is illustrated on Plate III, figures 1-15, Plates IV and XIV, and Plate XVI, figure 6.

No workshop where stone was chipped into points for arrows, knives, and the like was found on Merigomish harbour, but the work done at each of the many sites may have been insufficient to leave traces other than such finds as the writer made—the very few hammerstones, scattered chips and flakes, the possible chipper made of antler, the scrapers chipped from stone, and the more numerous chipped points. Several small sites were found in 1913 on the wind-swept sand on the west side of the harbour mouth near Bathurst, New Brunswick, where white quartzite pebbles, hammer pebbles, and chips indicated the former presence of workshops. If such small shops existed on Merigomish harbour, they may well have been obscured by the vegetation. It has been stated by Piers (a, page 111) that at a workshop site at Backman beach near Lunenburg a large number of chips and uncompleted chipped forms have been found.

Flaking. Flaking to finish some chipped objects is shown by the completely flaked points. The refuse flakes from this process are like very small chips and, consequently, not easily found. The finished product of flaking is shown by part of the work on the chipped points on Plate IV.

Pecking. Pecking is illustrated by many of the celts and hammers (Plate XII, figures 3, 4, 7, Plate XIII, figures 1-3, and Plate XIV, figures 8, 9). These celts show peck marks caused by striking the stone with a pebble or a hammerstone, like those illustrated on Plate XIV. Some celts were partly chipped into form before being pecked. After being pecked into shape they were usually finished by grinding and polishing, which effaced part or all of the peck marks (Plates XII and XIII and page 48).

Modelling. Modelling was used in making pots and forming their rims. The tools employed have not been certainly identified. They may have been made of wood, but it is possible that the fingers were chiefly used and that some of the bone objects, notably those considered as awls on page 64 (Plate XVII, figures 3-15), were also used for that purpose. No signs were seen of the probable use of the fingers in modelling, but impressions of finger nails were found on one fragment of pottery (Plate IX, figure 8). Patterson states (a, page 252) that impressions that may have been made by the finger nails can be seen on fragments of pottery in his collection. The finished products of modelling are illustrated on Plate VIII, figures 1-3, and Plate IX, figures 1-3.

Impressing. Impressing was done upon pottery for decorative purposes, before firing, probably with a stylus, in making lines, gashes, and dots (Plate X, figures 1-6, 12, 13), and in making scallops (figure 11); with the rocking stamp (figures 1, 14-27); with twisted cords (Plate XI, figures 1-12); and with what apparently was woven fabric made of porcupine quils or moose hair (Plate IX, figure 6, Plate X, figure 24, and Plate XI, figure 13). Impressions made with net work, with carved paddles, or with paddles covered with either cord or netting were not found.

Twisting. The process of cord-making is known to have existed, there being impressions on pottery (Plate XI, figures 1-3, 5-12), but no tools for the process have been recognized among the finds made here. Judging by these impressions the cord was two-ply. Cord was probably twisted with the fingers or upon the thigh, and was no doubt made from vegetable material, possibly basswood bark, as among modern Indians inhabiting the same area.

Knitting. No evidence of net-making was recognized, there being no impressions of netting on pottery, but some of the objects made of bone, notably the needles illustrated on Plate XVII, figures 17-20, the awls in figures 3-16, and the peculiar objects made of bone and a canine tooth on Plate VII, figures 5-8, may have been used as shuttles or net needles, like the needles used by the Micmacs in netting snowshoes (Plate XXI, figure 5).

Weaving. Three fragments of one pot bear impressions that seem to be of woven porcupine quills or moose hair (Plate IX, figure 7, Plate X, figure 24, and Plate XI, figure 13). It is said[1] that the Micmacs of Nova Scotia made canoes by plaiting willows and covering the form with gum.

Painting. Painting is known to have existed from the colour seen on five objects—red paint on two, purplish red paint on one, and red stain on two; also by eight pieces of material, six of them rubbed, and all such as on rubbing produce reddish brown or black paint (page 76 and Plate XIX, figures 1-4).

Red paint on a battered spot on each side of a specimen found in heap A, apparently the head end of a celt, described on page 48, suggests that the object was used to crush paint. The tools used in the process are unknown.

There is red paint on five other specimens, a daub of red, possibly iron rust, on one side of a notched adze (page 49 and Plate XIII, figure 3), and in the pits on one edge of an object made of antler (page 84 and Plate XIX, figure 18), purplish red paint on the upper end of an object made of whale rib (pages 19 and Plate VII, figure 13), and there is a spiral of red stain around two fragments of points made of bone, described on page 30, one of which is illustrated on Plate VI, figure 9.

Firing. Firing was employed to make clay into pottery (page 46). Many fragments of charcoal and some burned patches of ground were

[1] Cf. Gilpin, p. 221; Piers (a), p. 102.

found, some of which may be from the fires used in this process. The imperfectly oxidized condition of the interior and of spots on the surface of the ware shows that only low temperatures were used and suggests that open fires were employed.

WARFARE

Some of the objects, such as the points chipped from stone, considered as points for arrows and knives, and points made of bone, were possibly or even probably used in both warfare and hunting. Some of the objects considered as hammerstones (Plate XIV, figures 5, 6) may have been enclosed in skin and used as heads for war clubs. Clubs were not found, unless the fragment of the large object considered on page 19 (Plate VII, figure 13) is part of one. Possibly some of the celts made of stone, especially the grooved celt (Plate XIII, figure 3), were hafted as battle axes. The notched hammer made of stone (Plate XIV, figure 9) may have served as a head for a war club. Even some of the wedges made of antler may have been used as battle axes. Some of the objects made of bone and considered as awls on page 64 may have been used as points for arrows or as daggers.

The location of the camps on islands may have been as a protection from attack, for in such places an approaching war party would have no screen except darkness or fog, and might even be obliged to construct canoes on the mainland nearby, where they might be discovered. The "earthwork" near Barney river may be artificial, of the same time and culture as the shell-heaps of the harbour, and may have been used for defence.

DRESS AND ADORNMENT

Very little evidence relating to clothing materials, toilet articles, and personal ornaments was found. Materials suitable for red and black paint were collected. No combs were found, but some of the objects considered as awls may have been used as hair pins. Only a few pendants made of canine teeth of the bear and an incisor of the moose can be considered as personal ornaments, and no gorgets made of stone or beads made of any material were found. Some of the pin-shaped objects made of bone and considered as awls on page 64 may have been nose ornaments, especially the ornamented specimens seen on Plate XIX, figures 16, 17. No evidence of ear ornaments was found, unless we consider as such the objects made of bone and teeth mentioned on page 68. No necklaces, cut animal skulls, bracelets, rings, or ornaments made of metal were found, unless these same bone objects may have been fastened together to form necklaces.

Paint. Painting of the face and body is suggested by eight specimens which would produce paint; three being of rubbed ferruginous argillite, soft enough to mark paper, each producing a different shade of reddish brown. One, a pebble, has two parts of the edge ground, probably to reduce it to powder for paint (Plate XIX, figure 1). Another piece of the material has one end ground (figure 2). A third piece is rubbed on one side and an edge (figure 3). A fragment of hematite found in heap

D was probably raw material for red paint. A piece of siliceous hematite found in heap N is rubbed on all but a broken surface and would produce red paint. A piece of botryoidal hematite found in heap M is rubbed on one side and might have been used for red paint. A piece of schist carrying specularite, found in heap D, may have been raw material for glistening dark red paint. A piece of graphitic schist and argillite that produces a black powder is broken on two surfaces and rubbed on the remaining three (figure 4). The rubbing makes various curved surfaces, as might be the case where no attempt was made to shape the object, but only to remove material for paint. There is a V-shaped groove ground or incised in two of the surfaces and four such grooves crossing each other in the third surface. Across one edge is a deep, angular groove, apparently caused by grinding to obtain pigment.

Clothing Materials. Skins of some of the animals mentioned on page 16 *et seq.* as represented by bones, antlers, or teeth in the shell-heaps, furnished material for clothing. This at least does not contradict Lescarbot,[1] who met Micmacs subsequent to 1606 at Port Royal, and states that they wore a cloak of moose or stag, bear, lynx, otter, or beaver. No evidence of moose hair or quill work was found, unless the impressions on fragments of pottery (Plate IX, figure 6, Plate X, figure 24, Plate XI, figure 13) are such, although bones of the moose and porcupine were found. The fact that hair and quills are much more perishable than any material found by us may account for this. The impressions of cord upon the pottery (Plate XI, figures 1–12), and on casts taken of the impressions, which show still more clearly that the cord was twisted, prove that fibres, probably vegetable, were spun (page 75), and it is possible that they were woven into dress fabrics, although the skins of animals probably furnished the material for most of the clothing. Fragments of charred fabrics woven from vegetable fibre were found at the Roebuck site, Ontario, where, however, impressions of such fabrics do not appear upon a single fragment of pottery.

Costume. Nothing was found to indicate the style of costume worn, there being no figures or drawings, such as are found in some places, to indicate either the costume or the way of doing up the hair. According to Lescarbot the Micmacs of Nova Scotia wore a skin breech-cloth attached to a leather girdle, and a cloak of otter, beaver, moose or stag, bear or lynx, tied up with a leather thong, usually leaving one arm out. The cloak was set aside in the wigwam unless the weather was cold. The women wore a girdle about the cloak. In the winter the men wore "good brave sleeves, tied behind, which kept them very warm." In winter, going to sea, or hunting, the men wore long leggings cut into a great number of points on the side of the leg, and tied to the belt. They had no head-dress, but both men and women wore the hair loose over their shoulders, the men trussing it upon the crown of the head, some four fingers length, with a leather lace which they let hang behind.

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[1] Cf. Piers (a), p. 101.

The toe bones of the moose with the near ends opened and the far ends perforated may have been used for a rattling fringe on the costume. Two such objects that had not been opened at the near end were found (Plate XIX, figures 12, 13).

Moccasins. Moccasins were, probably, made from the skins of the moose, caribou, and possibly some of the other animals above mentioned. That moccasins were made of moose skin is corroborated by Lescarbot.

Hair Pins. The awls made of bone (Plate XVII, figures 3-10) may have been used as hair pins, especially those which bear art work (Plate XIX, figures 16, 17). Mills (a, page 48) considers that the larger, double-pointed awls made of bone and antler found on the Gartner site in Ohio and in graves may have been used as hair pins, since in the burials they were invariably found directly below the skulls.

Personal Ornaments. Personal ornaments other than pendants have not been identified as such if found by us, although Lescarbot[1] states that the prehistoric Micmacs wore "matachias" hanging at the ears, and about their necks, bodies, arms, and legs. These the women made of porcupine quills dyed black, white, and red. As such material is very perishable, it may account for our not finding anything made of it, but bones of the porcupine were found. He further states that "They wore esteemed matachias made of shell . . . . . which were difficult to get"; but we found no objects made of shell.

Beads. Wampum made of shell was not found here by the writer or by Patterson (a, page 236), although Piers (a, pages 104 and 117) states that a modern Micmac chief is said to have had a wampum belt, and there are two strings of shell wampum in the Provincial Museum, which, however, he believes were brought to Nova Scotia from New England. There are about nine beads made of shell from Nova Scotia in the Peabody Museum of Harvard University, and beads made of copper were found in Lunenburg county, according to Patterson (a, page 235).

Pendants. Three pendants made from canine teeth of the black bear were found, one from a smaller canine tooth, possibly of a wolf, one from a canine tooth of a seal, and one from an incisor tooth of a moose, but none of stone or shell. All of these are perforated, none being grooved. The three pendants made from canine teeth of the bear were found in heap A, and all are perforated through the root as if for suspension. One (Plate XIX, figure 5), being hollow, is perforated through one wall, the other is broken away by a small tapering hole, apparently not drilled but gouged from the outside. Another (figure 6), made from a tooth of an older bear, is perforated by a hole tapering from each end, apparently made by gouging from both sides of the tooth. A third specimen (figure 7) is hollow and broken at the root, but shows on one side a portion of a similar perforation, and below it towards one edge a perforation, apparently gouged, through one wall to the inner hollow. There are four grooves across the enamel, the upper one being deepest and with the upper cut nearly at a right angle to the surface. The bottoms of the two upper grooves appear to have been burned, especially in the deep

[1] Piers (a), p. 102.

upper groove, as if the core of the tooth had been burned by the grooving. On the reverse there are some very fine groovings across the enamel. All the grooves follow over the curve of the tooth, and are smooth as if made with some soft substance like a cord or thong. A canine tooth of a bear with a perforation through the root, evidently for use as a pendant, found in a shell-heap in Maine, is in the Peabody Museum, Cambridge, Mass. These perforated bear canines are like the toggles made of bear canines by the Montagnais Indians (Plate XXI, figure 6).

The pendant made from a canine tooth (Plate XIX, figure 10) lacks both ends, but half of a conoid-shaped perforation shows on each side of the root end. The perforation seems to have been gouged from each end. The seal's tooth (figure 11) has a hollow root, most of which is broken away at the tip, but in one side the thin wall has a perforation, apparently not drilled but cut, possibly for suspending it as a pendant. The pendant made of the incisor of a young moose (figure 8) with hollow root is perforated from side to side through the root about a third of the way from its tip with an oval hole that was apparently whittled or gouged out. The tooth bears incisions between the root and the enamel, as if an attempt had been made to cut it in two at this place, so that it may not have been intended as a pendant.

Possibly the perforated toe bones mentioned on page 80 (Plate XIX, figures 12 and 13) were used for pendants. The objects, one made of a canine tooth and others of bone (Plate VII, figures 5-8), may possibly have been hung like claws on a necklace. Though the object illustrated on Plate XIX, figure 19, may have been a pendant, more probably it was a rocking stamp used in the decoration of pottery. There is a small pendant made of stone from Nova Scotia in the Peabody Museum of Harvard University.

No perforated gorgets of any kind, that may have been personal ornaments rather than religious objects, were found in the shell-heaps, although, as stated below, at least six have been found in Nova Scotia.

Only one pin-shaped object made of antler (Plate XVI, figure 6), and none of bone or shell was found. This may have been an ear or nose ornament.

Necklaces, if worn, were possibly made up of the objects of bone and teeth considered on page 67 (Plate VII, figures 5-8), or of perishable material such as seeds or leather, as no bone or shell beads were found. Necklaces may have had pendants of canine teeth of the bear and seal and incisors of the moose since these objects were found.

GAMES, RELIGIOUS OBJECTS, PIPES, AND AMUSEMENTS

Only two objects that may have been used in games were found. They are both of the same kind, and are discussed under ring-and-pin game (Plate XIX, figures 12, 13).

Tubes and Cylinders. Bone tubes were not found, but the single pin-shaped object made of antler, mentioned on page 57 (Plate XVI, figure 6), may have been used in gambling.

Dice. No objects surely identified as dice were found, although a Micmac game called Indian dice is said to have survived from prehistoric times; it is played with six marked bone or walrus ivory disks. Another well-known surviving game is also played with disks similarly marked[1]. No objects were found similar to those known to have been used in a game like jack straws, which the Indians[2] claim has survived from prehistoric times. The astragalus bone of ungulates may have been used as a die.

Ring-and-Pin Game. Toe bones of the moose, perforated through the far articulation and cut off around the near end, were probably used in a game resembling ring-and-pin, since two specimens, apparently unfinished objects of this kind, were found. One (Plate XIX, figure 12) has a long conical pit gouged in the far end which does not extend through to the hollow interior. Otherwise the bone is natural. Another (figure 13) has a hole gouged in the far end, but shows no other signs of work. These two are the only objects made of toe bones found in the shell-heaps, although such objects made of the toe bones of deer are more common than those made of toe bones of any other animal in some other places such as Roebuck, Ontario, Ohio[3], and Mayslick, Kentucky[4]. The fact that the modern Micmacs sometimes use a bundle of pine twigs[5] for the ring in this game may explain why so few of these objects made of bone were found.

Some of the bone awls described on page 64 (Plate XVII, figures 3-10), especially those bearing art work (Plate XIX, figures 16, 17), may have been used in connexion with these toe bones for the pin. The toe bone or bones representing the ring may have been tossed up and caught on the point of an awl, as among the modern Montagnais. These toe bones may be compared with others drilled, cut, and notched which are known to have been used in the game among the Algonkin, Athabaskan, and Siouan tribes. However, the same general game, but with some substitute for the toe bones, is widely distributed in America, as described by Culin (page 527). The number of toe bones used in the game, which is played both for stakes and as a child's amusement, is not constant.

Manufacture of Toe Bone Objects. The manufacture of these toe bone objects is only partly illustrated by the specimens found, although the method used in Kentucky[6] is well illustrated by specimens found there. Flakes of stone (Plate III, figure 6) and points chipped from stone (figure10), either of which could have been used for cutting off the near end of the bones, were common. No drill points chipped from stone like those found in Kentucky or otherwise made were found, and the conical holes in the far articulation of the two specimens found seem not to have been drilled but gouged out, as they were in most of the objects of this kind found at Roebuck, Ontario. Flakes of stone were, probably, used for gouging the perforation in the far end of the bone. The completed object, made of the toe bone by cutting off the near end and perforating the far end, was not found.

[1] Cf. Piers (a), p. 109.
[2] Idem, p. 110.
[3] Cf. Mills (a), p. 58.
[4] Cf. Smith (a), p. 209.
[5] Cf. Culin, p. 528.
[6] Cf. Smith (a), p. 210.

Disks. No disks were found, although disks made of stone, potsherds, and shell, that may have been used in gambling, were commonly found in Kentucky.[1]

Religious Objects. Some or all of the pendants made from teeth of bear, moose, and seal, considered as personal ornaments (page 78, Plate XIX, figures 5-8, 11), may have been charms or amulets. The objects made of bone and canine teeth, discussed on page 67, and mentioned on page 79 as possibly parts of a necklace (Plate VII, figures 5-8), may also have been so used. The piece of botryoidal hematite, rubbed on one side as if used for making red paint, may nevertheless have been a fetish or merely a curio or keepsake, as in fact may several other of the similar objects described on page 76. The two pipes in the Patterson collection, one from the prehistoric cemetery and the other from the same island (page 82), were probably used in ceremonial and religious ways; but the latter pipe may be modern and not connected with this culture. Pipes were not found by us in the shell-heaps. No bone tubes such as are known from Kentucky[2] were found. The incised design upon the pebble shown on Plate XIX, figure 15, and the geometric designs shown in figures 16-20, may represent manitou or religious symbols.

Gorgets. Perforated gorgets made of slate or other material were not found. At least six common gorgets made of slate and polished have been found in Nova Scotia. Five are in the Provincial Museum. One, Cat. No. 86 in the Patterson collection, was found at Greenhill, Pictou county. Of those in the Provincial Museum, two have one perforation only, at the wider end, like four from New Brunswick in the Museum of the Natural History Society of New Brunswick in St. John; two have two perforations near the middle; and one, with side edges bulging near the middle, has a perforation near one end, and another, through which the object is broken, in the opposite end, but near the middle. It may have had three or more perforations.

Banner stones and allied "ceremonial" forms were not found, and are completely absent from the Maritime Provinces.

Plummets, Charm-stones, or "Sinkers". Plummets were not found by the writer, and they have been rarely found anywhere in Nova Scotia, although a number have been collected in New Brunswick. One of two in the Patterson collection may be from the Merigomish shell-heaps, as the collection largely came from there. There are nine in the Provincial Museum, seven being in the Des Brisay collection and two in the Fairbanks collection. One is figured by Gilpin, and one was owned by the late W. C. Silver of Halifax. This makes a total of thirteen known from Nova Scotia.[3] All these, according to Piers, are well shaped, and differ in form only in details, all having a knob on top but no perforation. According to an oral statement by him all plummets found in Nova Scotia are flattened, in some cases even across the natural cleavage of the stone. One plummet from Annapolis, Cat. No. 283 in the Patterson collection, has the axis of the knob at the top at an angle of 45 degrees from the planes of

[1] Cf. Smith (a), p. 210.
[2] Cf. Smith (a), p. 209.
[3] Cf. Piers (a), p. 114.

flattening of the two sides of the object. Piers states (a, page 114) that he thinks he has heard Noel, a Micmac chief, affirm that these plummets were used as a charm to bring fish to a fishing place; that other Indians believe they were used as sling-shots; and that an old Micmac woman said they were whorls used in spinning beaver fur for cloth to encircle a couple as the concluding part of the marriage ceremony.

Pipes. Pipes of stone or pottery were not found at Merigomish; they are rare in Nova Scotia. Loomis (page 41) found only two that are of pottery in the shell-heaps which he explored in Maine. However, in the Patterson collection there are two whole pipes made of stone and a fragment of another; one, which may be modern, from Big Island, and the fragment from the prehistoric cemetery. There are ten whole pipes made of stone—one probably not of native manufacture, another from outside the province—and two unfinished pipes made of stone in the Provincial Museum. A stone pipe was found on the farm of Edmund Zwicker about half a mile from the Eisenhauer shell-heap near Oakland, Lunenburg county. This makes a total of only fifteen known to be from Nova Scotia[1], and several of these appear to be modern. Of those in the Provincial Museum, several are of the typical Micmac type, one of the elbow type, and one of the platform type. One made of grey soapstone[2], found beneath a copper kettle and closely resembling pipes from southern Ontario, suggests that in modern times it was brought to Nova Scotia from the west.

The modern Micmacs, according to Dawson (a, page 19, Supplement), sometimes extemporize a tobacco pipe from a twisted cone of birch bark (Plate XXI, figure 7). Dawson suggests that if this habit existed among their ancestors, it would account for the comparative paucity of stone pipes.

The specimen from the prehistoric cemetery, Cat. No. 175 in the Patterson collection (Plate XX, figure 7), is made of grey soapstone or schistose slate, although Patterson refers to it as granitic rock and states (c, page 676) that "Dr. Dawson, of McGill college, Montreal, our highest authority on the geology of these regions, says that he knows of no rock of the same kind nearer than Chaleur bay." In another place (a, page 236) he refers to it as made of a very hard, micaceous clay, with a stem-hole nearly 2 inches long. Patterson (c, page 676) states that the form differs from any pipe previously found in Nova Scotia, but Sir William Dawson directed his attention to a collection from Ottawa river, purchased for McGill University, in which were several pipes, if not exactly the same in shape, yet plainly of the same type. It is broken and lacks most of both bowl and stem. Along the upper surface at each side of the stem an incised line or fine groove has been made. The stem-hole is about three-sixteenths of an inch in diameter.

Specimen No. 177 in the Patterson collection (Plate XX, figure 8), catalogued from Big island, is a pipe bowl made of grey sandstone, and is apparently modern. The bowl hole constricts from a point about half its depth. There is a small, transverse hole, about three-sixteenths of an inch in diameter, through the lower part of the bowl which may have

[1] Cf. Piers (a), p. 115.
[2] Idem (c), pp. 52–56, Fig. 96, Pl. III.

been either for the suspension of a cleaner, to facilitate attachment to the stem, or for the attachment of feathers or other decorative or ceremonial material. The other pipe, Cat. No. 176 in the Patterson collection, is from Tatamagouche.

Tobacco was not planted by the Micmacs in Nova Scotia, according to Gilpin (page 222).

Amusements. The astragalus bone of ungulates mentioned on page 80 as possibly used as a die may have been used as a buzz. The little celt or chisel, only about $1\frac{5}{8}$ inches long, made of soft sandstone and found in heap D, described on page 49, may have been a toy rather than a tool.

DECORATIVE ART

The graphic and plastic art of the prehistoric people of Merigomish harbour is illustrated only by fragments of pottery and a few other objects (Plate XIX, figures 15-17, 19,20). The art work is confined to red colour on five specimens, incised lines on two stones, incised lines, notches, and pits on artifacts of bone and antler, an incised line on a canine tooth of a bear, dots, pits, and gashes on pottery, notches impressed in the rim of pottery, impressions on pottery, and the form of pottery dishes. The applied art on pottery is apparently confined to the rim and neck, fragments apparently from the lower parts of the pots bearing no decoration. No art work on shell was found, and no modelling or sculpturing.

All is probably purely decorative rather than conventional, symbolic, or representative, with the possible exception of the incised lines on the pebble on Plate XIX, figure 15.

Geometric patterns include spiral bands of colour, notches, grooves with cross grooves, rows of pits, parallel lines made up of square and triangular impressions, V-shaped incisions, a sharp zigzag line, zigzag lines made up of square or triangular impressions, diagonal and horizontal bands made up of parallel rows of nearly transverse impressions of twisted cord, fan-like or radiating designs made up of curved rows of nearly transverse impressions of twisted cord, and impressions apparently of woven porcupine quills or moose hair.

Reddish brown colouring in spiral bands, which may have been applied for artistic purposes or may be merely a stain from windings, shows on two fragments of points made of bone, discussed on page 30, one of them the basal end of a barbed harpoon point (Plate VI, figure 9). This stain does not penetrate deeply into the bone, and on the latter specimen does not extend to the tip fragment, which, although found near the basal fragment, had been long broken from it. The coloured spiral may have been imposed on the basal fragment in some way after it had been broken, or the tip fragment may have been subjected to different conditions that caused it to lose the colour. Colouring materials have been discussed on page 76.

Incised lines were found on only two specimens of stone. Those on a greenish grey slate pebble (Plate XIX, figure 14) were, probably, not made for æsthetic reasons but to cut out material. Those on the

other specimen, a fragment of a pebble, consist of incised lines making up what appears to be part of a pictograph on the obverse (figure 15) and a curved line on the reverse.

Examples of incised work are more numerous on bone and antler. Incised lines forming two parallel V- or wigwam-shaped figures, with hatching between, and some faint incisions, show on the obverse of the object of unknown use (Plate XIX, figure 20). This object is a section of curved antler, nearly circular in cross-section and cut off nearly square at each end. On the reverse are traces of incisions suggesting a similar figure. Faint, nearly parallel, short incisions, almost notches, arranged in four nearly parallel longitudinal rows and running transversely in two of the rows, but slightly at an angle in the other two, can be seen on the basal end of the awl-like object, made of a piece of one end of a long bone (figure 16). These cover the lower end for about one-third the length that the object probably had before the point was broken off. Apparently there were other rows now obscured by wear and decay, but the work is somewhat irregular and there may not have been a regular arrangement of rows of incisions covering the area. Possibly, but not probably, these were made to facilitate fastening the object firmly in a shaft for use as an arrow or harpoon. Five similar rows, made up of short parallel notches or hacks, show on the object made of bone (figure 17). Both ends are broken off, but the object, apparently, is an awl or a point for an arrow or spear. The hacks were made from the smaller end towards the larger, which would naturally be the way if they were intended to hold the object from pulling out of a shaft, but they may have been purely ornamental. A row of nearly circular pits extends along both edges of the peculiar object made of antler (figure 18), except for less than a quarter of an inch on the convex side near the point and both sides of the base, which is broken off. A groove may be seen on both sides, extending from slightly nearer the point than the middle to within about three-quarters of an inch of the broken base.

Notches across the front edge may be seen on a fragment of a harpoon point made of antler from the prehistoric cemetery, Cat. No. VIII-B-679. The regular notches across the ridge on the fragments of three burned harpoon points made of bone found in the prehistoric cemetery (Plate VII, figures 1, 2), although useful as barbs, may possibly have been considered as æsthetic; but the notches must surely have been merely utilitarian.

Six sharp, transverse incisions, besides a long, duller cut parallel with the lower edge, may be seen on the perforated object made of bone or antler on Plate XIX, figure 19, which is probably a rocking stamp for ornamenting pottery, or possibly a pendant. A row of much worn or decayed notches, each longest crosswise, covers all but the upper end of the long edge; and a row covers the opposite edge, except at the upper end, but the notches in this case are more like transverse hacks. Transverse notches or incisions, hacked from the obtuse end of the edge towards the acute one, show clearly on the lower edge. A longitudinal incision extends along all but the upper part of the back edge of a fragment of a small harpoon point made of bone (Plate VI, figure 20). Two parallel incisions extend along each of the sides, near the back edge; but the second groove is farther from the tip, especially on one side. Notches, which slant slightly, cross

the corners of the back edge and the front edge. These are in one edge on the sharp part, and on two corners on the undercut, below the barbs, that is, one on each corner of the undercut. A longitudinal row of small pits may be seen on one of the two smooth sides of a fragment of burned bone nearly square in cross-section, Cat. No. VIII-B-687, found in the prehistoric cemetery. Three parallel, longitudinal grooves, each bearing minute, slightly oblique cross-grooves, making them resemble impressions of twisted cord, extending about half the length of the object, may be seen in the middle of one side of the harpoon point made of bone (Plate VI, figure 8). A longitudinal row of pits may be seen on the back edge of a fragment of a large harpoon point made of bone or antler (Plate VI, figure 17). This row extends over half the length of the fragment; in the other half it is replaced by a groove. A row of pits bounds the front edge and the notch under the barb on the smoother side, being the outer side of the bone or antler; another row slightly farther from the edge bounds the back edge. A longitudinal row of large pits or gouge depressions and a longitudinal groove may be seen on the back edge of a fragment of an antler harpoon point, from the same place, Cat. No. VIII-B-679. The groove may be the trace of grooving made in cutting out the harpoon. Pits impressed in rows on pottery, apparently with a stylus-like tool, are illustrated on Plate X, figures 2-4, 12, 13, and Plate XI, figures 7, 8. A row of vertical slits or gashes made in the neck of a pot before the ware was fired is illustrated on Plate X, figure 2.

Much impressing upon pottery was done before the ware was fired. The impressions are apparently confined to the rim and upper part of the pots, as none of the fragments supposedly of the lower part bears any decoration. Some of this impressing was apparently done with simple stylus-like tools (Plate X, figures 2-9, 12, 13). These impressions take the form of lines in some specimens (figures 2-4, 6, 8, 9). Scallops were impressed in the upper edge of the rim of one pot, as is shown by a fragment (Plate X, figure 11). Though impressions of the finger tips were not seen on any of the ware, there are impressions of the nails on a single fragment from heap K (Plate IX, figure 8). No impressions of paddles carved in checkers or otherwise were seen, nor of paddles wrapped with cord or netting. Pits impressed in rows may be seen on a few specimens (Plate X, figures 2, 12, 13, and Plate XI, figures 3, 7, 8). About a tenth of the fragments bear decorations impressed with a rocking stamp. One of these fragments (Plate X, figure 22) bears a zigzag, apparently impressed with a knife-edged stamp. Some of the fragments bear parallel lines (Plate X, figures 14, 16-18), others zigzag lines (Plate X, figures 1, 19-21, 23), all made with a rocking stamp. Parts of these lines are made with a rocking stamp making rows of square depressions, each alternate square being impressed deeper than its neighbour (Plate X, figures, 14, 15, 17, 20, 21), others, also made with a rocking stamp, making rows of triangular depressions on the sides of the lines, those on one side being impressed deeper than those on the other (Plate X, figures 1, 12, 16-19, 23).

Impressions, apparently made with a twisted cord (Plate XI, figure 7), may be seen on many of the fragments. Rows of nearly transverse, parallel impressions of twisted cord, apparently applied by impressing with a twig wound with twisted cord (Plate XI, figures 1-10), may be seen on other

fragments. Cords varying in thickness from coarse to quite fine were evidently used. Somewhat different impressions, apparently made with a twig wound with some such material as squarely cut strips of bark or skin (Plate XI, figure 15), may be seen on a few fragments.

A wide band of parallel, oblique rows of cord-wound twig impressions, with another band below it of these impressions arranged parallel and horizontal, may be seen on fragments of the upper part of a pot (Plate XI, figure 1). Diagonal lines made up of similar impressions may be seen on the edge of the lip of some of the ware (Plate VIII, figure 11, and Plate XI, figures 2, 3). Long, vertical, parallel rows of impressions of twisted cord, and long, horizontal rows made up of short, nearly vertical, parallel impressions, also of twisted cord, apparently applied by impressing horizontally a cord-wound twig, may be seen on one specimen of pottery (Plate XI, figure 7).

Radiating or fan-like designs, composed of concentrically arranged, curved rows made up of nearly transverse impressions of twisted cord, apparently laid on with a curved twig wound with cord (Plate IX, figure 13), may be seen on some of the fragments of pottery (Plate XI, figures 5, 6).

Parallel and diagonal lines, some of them apparently parts of diamond-shaped figures and all forming a pattern like woven technique, occur on three fragments of pottery apparently belonging to one pot, and seemingly impressed in the soft clay, before it was fired, by woven porcupine quills or moose hair (Plate IX, figure 6, Plate X, figure 24, and Plate XI, figure 13).

Pictographic art is absent, unless the scratches making an animal-like figure on the pebble on Plate XIX, figure 15, which may represent the manitou of the maker or owner, are part of a pictograph, or some of the faint incisions, the plainest of which form two parallel V- or wigwam-shaped figures, in figure 20, are pictographic. The nearest petroglyphs are at Fairy lake, where a large number are incised on slate, at George lake, and on Port Medway river, all in Queens county, Nova Scotia, to the southwest of Merigomish.[1]

The technique of some of the incised geometric designs on bone and antler is good. Some of the geometric designs impressed on pottery are of excellent patterns, but the execution is crude; that of the possible pictographic sketches is inferior to the geometric designs.

METHOD OF BURIAL

No graves, mounds, or other evidence of the method of burial by the prehistoric people of Merigomish harbour are known except burials in the prehistoric cemetery described by Patterson (a, page 231; b, page 29), and a tooth and one stray bone found in heap A. A skull, No. 233 in the Patterson collection, is catalogued as from the Dunbar farm, south Pictou. No burial mounds have been found anywhere in Nova Scotia, and graves are rare[2]. In prehistoric times, perhaps only in certain circumstances, the Micmacs wrapped the body and placed it in a tree or on a scaffold.[3]

[1] Cf. Piers (a), p. 117, and (d), p. 13.
[2] Cf. Gilpin, p. 227; Piers (a), p. 117.
[3] Cf. Piers (a), p. 109; Denys, p. 438; Gilpin, p. 227.

The only burials in the ground, found by the writer on this harbour, were in the prehistoric cemetery described by Patterson. The place was located back on the hillside about an eighth of a mile north from a small shell-heap. Patterson found a spot 8 or 10 feet in diameter with evidences of burials extending down 15 to 20 inches. There were also, over a space about 50 feet square, several graves lying to the west of this spot, none over 9 to 12 inches deep, and from 3 to 5 feet apart. Patterson states that at the bottom he found decayed fragments of birch bark in which, according to the custom of the ancient Micmacs, the dead were laid, below which the subsoil had not been disturbed. The writer re-dug the spot, which was about 10 feet in diameter, but found no remaining evidence of burials west of or beyond it. The body, in at least one case, according to Patterson, was flexed, lain on its side, and, he thinks, with the head north and face west. In other instances he found several together, and in the circular spot the writer found fragments of bones of several individuals, some young, others old. Both Patterson and the writer found ashes, charcoal, burned earth, and bits of burned human bones scattered through the soil in the pit. In all the graves except one he found prehistoric objects. These include points chipped from stone, pieces of harpoon points made of bone, adzes made of stone, fragments of pottery, knives made of copper, and a fragment of a pipe made of stone; and the writer found specimens of arrow points and fragments of harpoon points, of an adze, and of pottery. Objects are said[1] to be more commonly found in graves as one goes east in the area of the Maritime Provinces and Maine.

In the shell-heaps even stray human bones are rarely found, only one bicusp and the upper end broken from a femur, dug up in heap A, being found by the writer in all the shell-heaps of this harbour. These may have been brought from a nearby burial place by dogs, scattered from graves in trees, or lost during a reinterment or ceremonials. Possibly they are the remains of cannibals.

Considering that the prehistoric cemetery opened by Patterson was back from the shore, that no burials were found along the shore, and that human bones were rare in the shell-heaps, it may be concluded that the dead of Merigomish harbour were probably all usually deposited either in the ground, on scaffolds, or in trees at some distance from the village sites, perhaps 100 feet or so distant, possibly behind the shell-heaps, but not along the shore or in mounds, and that the bodies were flexed, resting on one side on birch bark, sometimes with the head north, and always accompanied by artifacts. So far as known these conditions also apply to Nova Scotia in general. Possibly the shell-heap sites were summer camps, and the dead may have been removed to the vicinity of winter camps in the interior.

CONCLUSION

The chief remains on Merigomish harbour are small shell-heaps, which may be of summer camps, the main village and burial grounds possibly lying back from the shore. Many of the animals of the region, especially most of the edible shell-fish, were used for food. Some of these

[1] Cf. Dixon, p. 6.

animals, though historically known in the province, are now extinct in the vicinity. Nothing was found to indicate the use of wild plant food, nor any evidence of agriculture, such as specimens of corn or beans. Stone, copper, clay, bones, antler, teeth, walrus ivory, and vegetable substances were used as material for weapons, tools, and other manufactures; but nothing made of shell was found. Among objects used in securing food by hunting and fishing, were many projectile points of chipped stone and shaped bone; also barbed harpoon points of bone. One object, thought to be a point of an arrow, is made from a shark's tooth. No certain evidence of fish-hooks or any evidence of nets was found. The many fragments of pottery show that the people of the sites were not exceptionally proficient in its manufacture. Most of the pots were apparently rounded at the bottom, but a few were conoid. The lips were usually straight; but some were slightly outcurved. No pieces had handles or lugs. The pottery belongs to the middle and north Atlantic Slope group, and differs from that of the Iroquois group to the west. It was decorated in various ways, especially with impressed designs and roulette marks. Three fragments are impressed with what appears to be woven porcupine quills or moose hair, but none bears sculpture. Mortars are not represented, unless shallow objects like great whetstones are such; and no pestles were found.

Among tools supposed to have been used by men are many crude celts of stone. No gouges of any kind were found, although they are about half as common as celts in collections from Nova Scotia as a whole. No grooved axes made of stone were found, although at least eleven have been found in the province. Several wedges are made of whale-rib bone and of antler. A few hammerstones are merely battered pebbles, none being pitted. Whetstones were mere sandstone fragments and pebbles; some were used as plow grinders and a few had one or two offsets on one edge. Beaver teeth, artificially sharpened, supposed to have been used for knife points, were common. A few were trimmed. A very few similar objects were made from woodchuck teeth. Knives were chipped out of stone. No drills were found. Among tools thought to have been employed by women are scrapers chipped from stone, many awls made of bone, and a few needles made of the same material. The methods of manufacture include rubbing or grinding, polishing, breaking, cutting, cutting and breaking, perforating, punching, chipping, flaking, pecking, modelling, impressing, twisting, knitting, weaving, painting, and firing.

The numerous sites on islands may have been for protection from an approaching enemy. If the people were fond of personal adornment, all evidence of it has disappeared except five pendants made of teeth; for no beads of stone, pottery, shell, or bone were found; nor any pendants of stone or shell; nor ornaments of stone or shell perforated for suspension. Only two pipes, those in the Patterson collection, are known to have been found.

The people decorated a few of the things they made, especially by incising, notching, pitting, and impressing, but not by modelling or sculpturing; and the form of some of the pottery dishes was æsthetic. They made chiefly geometric designs, some of which may be representative or conventional, but no definite realistic representations were found. The nearest known pictographs in the province are over 150 miles away.

Of human bones only small fragments were seen in the prehistoric cemetery, and only a fragment of bone and a tooth in the shell-heaps, so that there is no evidence of wounds, injuries, or disease. One prehistoric cemetery has been found on the harbour where burial was made in the ground, on a hillside back from the beach. No mounds are known in the province, but bodies were placed in trees or on scaffolds in historic times. Intertribal trade or gifts, conquests, or extended journeys are not indicated by any of our finds.

The people of the harbour left less imperishable material in the shell-heaps than would be found in some village sites in other places, such as, for instance, the Iroquoian sites of New York and southern Ontario. The specimens from Nova Scotia, or from the Maritime Provinces as a whole, are not of great variety, nor of a high order of technique and art, as compared with those from New York, southern Ontario, southern Manitoba, or southern British Columbia. This condition suggests poorer people, sparser settlement, or a shorter period of occupation, if not all of these conditions.

The prehistoric culture on Merigomish harbour appears to be a prehistoric Micmac Indian culture. The Micmacs are the only Indians known to have lived in this area, and the archæology bears certain resemblances to the material culture of the modern Micmacs. These Indians use a lance-shaped, simple point made of bone for hunting caribou, and a barbed point of the same material for seal-hunting. Some of the awls resemble modern Micmac snowshoe mesh punches. No handles for the knives made of incisor teeth were found. If they were hafted in wooden handles, as are the modern Micmac crooked knives, the handles would have decayed. But the shape of the modern handle is like the one made of antler holding a beaver tooth incisor, found at Bocabec, New Brunswick. A Micmac skin scraper, made of bone sharpened at the end, resembles an object from the harbour, possibly used for the same purpose. The shape of the modern needles made of wood, antler, and copper, is like that of the old bone needles. There are certain differences, however; chiefly, the expected absence of perishable material corresponding to that used by the modern Micmacs; but also the absence of skin scrapers, like draw-shaves made of leg bones, similar to those found among the Micmacs, Montagnais, Beothuks, and Naskapi. There is also the absence of the disks of bone used in the bowl game, so characteristic of the modern Micmacs and their neighbours. These are so numerous in proportion to other objects among the modern Indians that one would expect to find them in the extensive collection made. They are also absent among archæological specimens found in Nova Scotia as a whole. This game, therefore, is probably new to the Micmacs; or the disks are new and replace some such objects as plum pits. The modern Micmacs use stone pipes, whereas on the harbour none was found in the shell-heaps and only a few are known, which may be modern. There is nothing to show that the cone-shaped birch-bark pipe was used in ancient times on the harbour, although, being perishable, it would not be preserved. That the modern Micmac does not make arrow points of stone since the gun has taken the place of the bow and arrow for serious hunting is a natural development rather than an indication that he belongs to a different culture from that of the shell-heaps

on the harbour. That he has abandoned the manufacture of pottery, since he has been able to secure tin pails, better pottery, and glassware, is as natural as it is that most of our own people do not make pottery.

The archæology also bears certain resemblances to the material culture of neighbouring modern Indians. Some of the small sharpened pieces of bone are similar to points lashed obliquely at the end of a stick to make fish-hooks among the Montagnais. The toe bones perforated at one end may be unfinished objects, needing only the other end cut off to make them like the ring used with a bone awl for the pin in the ring-and-pin game by the Montagnais. The perforated bear canines are like those used as toggles among the Montagnais, except that the holes are gouged out rather than drilled; but the drilling in the Montagnais specimens appears to have been done with white men's tools, and the use of the drill may have been adopted by them recently.

Eskimo work has been suggested by Patterson (a, pages 236-237) because of some of the finds on the harbour, especially the harpoon heads with a perforation through the tang for retrieving lines, and the toggle points for harpoons. Piers (a, page 110) has intimated that the Eskimo probably once lived in Nova Scotia, and that some stone implements found in the province may not be of Micmac origin because of the prevalence of many adzes and the rarity of the grooved ax—also rare or absent in Huron-Iroquoian sites—which is common enough within the area occupied by the Algonkian linguistic stock to the southwest and west of Nova Scotia. He also states that the Eskimo were driven northward by the Micmacs in traditional times. The harpoon head with the hole through the tang is found among many tribes besides the Eskimo, even among the modern Indians. Fragments of pottery were much more numerous on Merigomish harbour than harpoon heads and toggle points for harpoons. Pottery is not found among the nearest Eskimo, either in their archæological sites or among the present people; besides, the fragments collected are clearly from pottery of Algonkian types. The adze is prevalent, and the grooved ax rare in many places in eastern North America which are far to the south of any area the Eskimo are even suspected of inhabiting. Among many perforated objects, none having drilled holes was found, though the Eskimo, past and present, are known to be great drillers, even frequently detaching pieces of bone, antler, and ivory by drilling rows of holes and breaking along the line of holes. It is possible or even probable that the Micmacs may have secured some objects and ideas from the Eskimo, among them the toggle points for harpoons. It is even possible that a few Eskimo may have visited these prehistoric Micmac sites; but it is not possible that the sites are Eskimo rather than Micmac.

Some of the material from Nova Scotia is not strictly localized, and there is no large or fairly complete collection from any one place besides Merigomish harbour. Thus, satisfactory comparison of Merigomish material with that from another place on the coast of the province, or with material from a site in the interior, cannot be made, but only with certain specimens from such sites, and with many that are not positively localized, but are only strongly supposed to be from the province. On this harbour the peculiar long, slender, bayonet-shaped points of hexagonal

cross-section are not found, although reported, without details as to mode of occurrence, from the eastern shore of Nova Scotia. There are absent also gouges, though about half as numerous as celts elsewhere in the province; grooved axes, though they have been found in Nova Scotia; plummets, though thirteen have been found in Nova Scotia; beads made of copper, though they have been found in Lunenburg county; stone tubes ground out of slate, though two have been found in Halifax county (whether from shell-heaps, graves, or on the surface, these tubes differ from the ordinary tubular pipe in that the bore is large and uniform throughout the length, except at one end where it abruptly narrows to a much smaller size); gorgets made of stone, though they have been found in Nova Scotia.

These differences may be due to differences of tribe, of local culture, or merely of occupation in different places. For instance, the prehistoric people of Merigomish harbour may have used some different tools when back in the interior of the province from those they used on the harbour.

The Micmac Indians occupied Nova Scotia, Prince Edward Island, Gaspe peninsula, and all of New Brunswick except the valley of St. John river. They are more closely related to the Algonkian tribes sometimes referred to as the Abnaki group, comprising the Malecite, Passamaquoddy, Abnaki, and Penobscot, who together occupied the area to the west, from the St. John valley to the western boundary of Maine, than to those of southern New England[1]. The languages also of the Abnaki tribes were more closely related to the Micmac than to the tribes to the south.

The prehistoric culture of this harbour clearly forms a part of that of the whole area roughly including Gaspe, the Maritime Provinces, and Maine, which is different from that of the adjacent part of New England[2]. The village sites are less abundant than in the adjacent area, particularly its southern and western part where the sites are semi-permanent. Apparently the village sites of the northern area are without the cache-pits for the storage of grain and other foods usual at the more southern sites. East of Penobscot valley they show few traces of defensive works; thereby contrasting with the villages of the adjacent area, which are sometimes associated with defensive works and crude enclosures.

The shell-heaps are confined to the coast. They are not infrequently large and very numerous, especially in Maine and the adjacent part of New Brunswick, as at St. Andrews. In them are found a few artifacts of stone and bone, and fragments of pottery, but a larger proportion of objects made of stone is found in these heaps than in those to the south. The stone objects increase in number to the north and east. In the southern region they are relatively few, and are mostly points for arrows; celts and gouges are rare and grooved axes are practically absent in the heaps, though found in considerable numbers in collections of miscellaneous and surface finds. Objects made of shell are absent at Merigomish, though found in heaps to the south. Fragments of pottery are apparently more numerous and increase towards the north and east. Though still

[1] Cf. Dixon, p. 8.
[2] Idem, pp. 4–7.

indicating a coarse, heavy type of vessel, they show, towards the east, a different form of base, rounded rather than conical; the prevalence of an outcurved lip becomes more notable. In the area to the south they have a conoid base and a straight lip. Decoration also is somewhat different. The textile and cord impressions are much less common, stamped designs more common. Incised lines occur on the southern ware and punch marks on both. Some form of lug on the pots is not uncommon, though not found on Mergomish harbour; but it is rare or lacking in the area to the south. Plummets, abundant in Maine, are less common in the Maritime Provinces, there being only thirteen known from Nova Scotia and none from Merigomish harbour.

The graves are of two kinds. The more common are substantially like those of the area to the south, with bodies normally flexed. Objects are found in the graves towards the east, but commonly not in those in the southern area. Small knives and awls of hammered copper are found in the graves in Nova Scotia; but no ornaments of metal have been found in them. In some cases, in the southern area, copper ornaments such as cylindrical beads, gorgets, etc., occur, and shell beads rarely, in graves antedating European contact. The other kind of grave, which has only been recorded from the region of the lower Penobscot valley, is characterized by the abundance of red ochre in the graves, the complete or almost complete disappearance of the bones, and the fact that the objects found often lie on large heaps of the ochre. The objects differ from those found in the more common graves in that they are always made of stone, include practically only celts or ungrooved axes and adzes, gouges, and peculiar, long, slender, bayonet-shaped points, usually of hexagonal cross-section, which are never found in the more common graves or in the shell-heaps, although reported, without details as to mode of occurrence, from New Brunswick and the eastern shore of Nova Scotia, and seemingly associated with Beothuk remains at several sites in Newfoundland.

The surface finds indicate that gouges found in both areas, and the mortar and pestle found in the southern area, are almost completely absent, that grooved axes are scarce, although found in considerable numbers in the southern area, but practically absent from the shell-heaps, and that gorgets made of stone, banner-stones, and problematical forms, which occur sporadically in the area to the south, are scarce. Pipes are rare, although found in the southern area. The two peculiar stone tubes said to have been found in Halifax county, Nova Scotia, are unknown in New England except from the extreme northwestern part of Vermont, but are found in various parts of Ontario and in Ohio.

In the area to which Merigomish harbour belongs, in contrast with the area to the south, there is little evidence of permanent village life. In the former area little agriculture seems to have been practised, whereas in the latter a considerable degree of agricultural activity is evidenced by pestles and cache-pits. A limited use of the grooved ax, little trace of undoubted defensive works, little use of gorgets, no use of banner-stones or problematical forms in stone, the presence of long, bayonet-shaped points ground out of slate, and the possible presence of peculiar stone tubes, differentiate the former area from the latter.

In this northern area, especially among the Micmacs, agriculture was absent even in the parts of the country adapted for it, whereas it was found among the tribes in the adjacent area to the south; the long house was either not used or infrequent, whereas it was frequently used by the other tribes; feather cloaks were made by the southern tribes; copper ornaments were very rarely used, but were more frequent among the southern tribes; the governmental system was less well developed among the Micmacs and Abnaki than among the Indians to the south who had semi-hereditary chiefs; and the religious ceremonial among the northern tribes was characterized by greater simplicity than the more complex ceremonial and series of dances of the tribes of the adjacent area.[1]

Archæology, fortified by language, mythology, and culture of known tribes, points to the general conclusions[2] that the northern area was apparently inhabited by the Micmac with the Abnaki, before the two divisions of the southern area reached there, and that they apparently came from a different place and by a different route.

The Micmacs, when in the St. Lawrence region, would have come in contact with Iroquoian Indians and with Algonkian tribes preceding the Iroquoian tribes in Ontario, and may thus have acquired the knowledge and use of stone tubes and of copper, although copper, being found in the region of the bay of Fundy, might have been treated like a stone suitable for pecking, without Algonkian teachers. However, the use of copper is more typical of the Algonkians north of the Great Lakes than of those living to the south, probably because they were nearer a large source. Small copper knives and awls, apparently of a similar type to those found in the Micmac area, have been reported from graves and other sites in Ontario attributable to pre-Iroquoian people. The gouge, although not found on Merigomish harbour and rare in the shell-heaps or graves of the historic tribes of southern New England, is abundant in that area, increases in abundance towards the north and east until it is about half as abundant as the celt in Nova Scotia, is abundant in certain apparently very old graves in the northern Champlain valley, and disappears rapidly to the south and west.

The Micmacs were apparently later driven from this early habitat down the St. John valley to New Brunswick and Nova Scotia by the Iroquoian tribes from the Great Lakes. The limit of Iroquoian advance coincides exactly with the limits of agricultural lands in the St. Lawrence valley, where such lands are suddenly barred by the rocky country reaching the river[3].

The Merigomish Harbour culture, as has been seen, has typical characteristics, which are distinct from those of Nova Scotia as a whole. The area to which it belongs has typical characteristics that are distinct from those of the adjacent area in New England, which in turn has characteristic features, all of which find their similarities toward the southwest and south. Its characteristics find their analogies[4] in the region of the

[1] Cf. Dixon, p. 11.
[2] Idem, pp. 11–14.
[3] Cf. Dixon, pp. 11–14.
[4] Cf. Dixon, p. 8.

middle and upper St. Lawrence valley, chiefly in sites that are recognized as pre-Iroquoian; the Iroquoian tribes found there by the first Europeans being probably immigrants from farther south. The Malecites have a tradition that they migrated eastward pressed by the Iroquois[1].

The material culture of the sites on Merigomish harbour belongs to the northern area of archaic pottery rather than to the southern area of more highly developed ware; to the middle and north Atlantic slope pottery area, as distinct from the Iroquois pottery area; to the Algonkian linguistic area, as distinct from the Iroquoian or Eskimoan linguistic areas; to the region of Gaspe, the Maritime Provinces, and Maine, as distinct from the adjacent part of New England to the south or the Eskimo area to the north; to the prehistoric Micmac Indians, as distinct from the Abnaki and the more distant southern New England tribes, the Eskimo, or the Iroquois. It has analogies to pre-Iroquoian sites of the middle and upper St. Lawrence.

[1] Cf. Dawson, p. 44.

APPENDIX I

The following collections, catalogued under Nos. VIII-B-836 to VIII-B-1250, and VIII-B-1273 to VIII-B-1275, were made in shell-heap A:

Quartz pebble
Charcoal and carbonaceous matter
Oyster shells
Quahog shells
Mussel shells
Shells of the soft-shelled clam
Shells of the horse clam
Moon shells
Boat shells
Two shells of *Urosalpinx cinerea* Say
A basket shell
A mass of fish bones
Molar teeth, pieces of lower jaws, and five other bones of moose
Toe bones of moose
Twenty-six incisor teeth, molar teeth, lower jaws, and a piece of an upper jaw of the beaver
Five incisor teeth and broken lower jaws of the porcupine, one jaw bearing marks of cutting
A broken lower jaw of squirrel or rabbit
Broken lower jaws of the raccoon
A right lower jaw of a fox
Canine and incisor teeth of small carnivorous animals
Six pieces of lower jaws of carnivorous animals
Four canine teeth, eighteen molar teeth, and six lower jaws of the dog or wolf
Eight canine and four molar teeth, part of a skull, and a left lower jaw of the bear
Vertebræ of a small whale
Five teeth
Two pieces of lower jaw, fragments of two skulls, and bones of sea mammals
Eighteen canine teeth and bones of the seal
Bones of mammals and birds
A human bicusp and a near end of a human femur
Two large split pieces of a bone of a moose
One hundred and eight broken bones
Leaf-shaped point chipped out of metargillite (Plate IV, figure 1)
Three long leaf-shaped points chipped out of metargillite
Six coarse triangular points chipped out of metargillite
Six fine triangular points chipped out of metargillite (Plate IV, figures 3–5)
Three tanged, lozenge-shaped points chipped out of metargillite (Plate IV, figures 10, 11)
Three tanged points chipped out of metargillite (Plate IV, figure 8)
One stem of a point chipped out of metargillite
Seven notched points chipped out of metargillite (Plate IV, figures 14–19)
Trapezoid-shaped object chipped from metargillite (Plate XVI, figure 7)
Three tips broken from coarse points, chipped from metargillite
Three butts broken from coarse points, chipped from metargillite
Six tips broken from fine points, chipped from metargillite
Eight butts broken from fine points, chipped from metargillite
A pebble of metargillite
Two chips of metargillite
Fifteen chipped pieces of metargillite
Eight rejects chipped from metargillite (Plate III, figures 10, 15)
Twelve rejects chipped from metargillite (Plate III, figures 7–9)
Two broken barbed points chipped from quartz
A leaf-shaped point chipped from quartzite
A tip of a small, fine point chipped from chalcedony
Five scrapers chipped from quartzite
White quartzite pebbles
Thirty-eight white quartzite pebbles, mostly small, some large, from which a piece or a few pieces have been chipped until often more than half of the pebble was gone (Plate III, figure 1); or chips from such pebbles (Plate III, figure 2); some chips show one or two battered poles from which further chips were struck (Plate III, figure 3)
Eleven chipped pieces of quartz (Plate III, figure 4)
A leaf-shaped reject chipped from quartzite (Plate III, figure 11)
Fourteen simple points made of bone (Plate V, figures 1–12)
Two long points made of bone (Plate V, figures 14, 15)
Two fragments of special points made of bone (Plate V, figures 16, 17)
Two fragments of lance-shaped points made of bone (Plate V, figures 18, 19)

Point with a tang, made of bone (Plate V, figure 20)
Point or barb made of bone (Plate V, figure 21)
Point for an arrow or knife made of a shark's tooth (Plate V, figure 22)
Fifteen fragments of harpoon points, barbed on one edge, made of bone (five illustrated on Plate VI, figures 1, 3–5, 15)
Harpoon point with one barb, made of bone (Plate VII, figure 2)
Small harpoon point with seven barbs on one edge, made of bone (Plate VI, figure 6)
Harpoon point barbed on one edge, made of bone, with tip removed by incising and breaking, and decorated with three parallel lines (Plate VI, figure 8)
Harpoon point barbed on one edge, made of bone, with one end cut off
Fragment of a harpoon point barbed on one edge, made of bone, and partly charred
Two fragments of harpoon points barbed on one edge, made of bone (one illustrated on Plate VI, figure 9)
Harpoon point barbed on one edge with hole through tang, made of bone (Plate VI, figure 10)
Three fragments of harpoon points barbed on one edge, with hole through tang, made of bone
Three basal fragments of harpoon points barbed on one edge with hole gouged through tang, made of bone (Plate VI, figure 13)
Forty-six asymmetrical celts (some illustrated on Plate XIII)
One section of a celt
Eleven head fragments of celts
Double-bitted adze, made of stone (Plate XIII, figure 4)
Five hammerstones (two illustrated on Plate XIV, figures 1, 2)
Hammer made of a celt of stone (Plate XIV, figure 8)
Eight whetstones made of pebbles
One whetstone made of a waterworn slab of sandy argillite
Plough grinder made of mica schist (Plate XV, figure 2)
Whetstone with steps in edge (Plate XV, figure 3)
Implements made of antler
Four fragments of objects made of bone
Wedge made of a sliver of a rib of a whale (Plate XVI, figure 1)
Two wedges made of large round prongs of antler (Plate XVI, figure 2)
Wedge made of small prong of antler (Plate XVI, figure 3)
Wedge made of bone (Plate XVI, figure 4)
Six broken objects made of antler (Plate XVI, figure 5)
Pin-shaped object made of antler (Plate XVI, figure 6)
Twenty-eight knives made of incisor teeth of the beaver (Plate XVI, figures 8–15, 18, 19, 21, 26)
Knife made of an incisor tooth of a woodchuck (Plate XVI, figure 25)
Implement like a bark peeler, made of bone (Plate VII, figure 9)
Two implements made of bone
Forty-one awls made of pieces of thick-walled bones
Twenty-three awls made of long bones of birds
Sixteen awls made of large splint bones
Two awls made of ulnæ of the red fox
Three awls made of ulnæ
Awl made of bone
One awl made of a fish spine
Simple points made of bone
One hundred and seventeen fragments of awls made of bone
Four pointed objects made of bone
Fragments of pointed object made of bone
Piece of copper, possibly a point or awl (Plate VIII, figure 3)
Fourteen fragments of needles made of bone (Plate XVII, figures 17–19)
Three fragments of two perforated objects made of bone (Plate XVII, figure 20)
Implement made of bone (Plate VII, figure 9)
Six small objects made of bone (Plate VII, figures 5, 8)
Fragment of an object made of bone (Plate VII, figure 11)
Object made of antler (Plate XIX, figure 18)
Five scrapers chipped from quartz
Three scrapers chipped from stone
Fragment of a large object chipped from stone
Fragment of a blade chipped from stone
Fragment of an implement chipped from quartz
Ten pieces of worked bone
Three fragments of a flat implement made of bone
Three fragments of canine teeth of the bear
Two unfinished implements made of bone
Small oval pebble
Fragment of a worked rib
A worked bone of a bird
Worked toe bone of a large mammal
Basal fragment of a large object made of bone (Plate VII, figure 11)

Six fragments of worked bone
Eight worked pieces of bone
Fragment of a tool?, made of bone
Fragment of a point with notches, made of bone (Plate V, figure 17)
Two worked pieces of stone
Broken, unfinished implement made of stone
Three unfinished (?) objects made of stone
A worked bone
Toe bone of a seal showing cutting
A cut piece of bone of a sea animal
Twenty-one cut bones
A piece of ferruginous argillite rubbed probably to make red paint (Plate XIX, figure 3)
An unfinished stone object
An incised greenish slate pebble with edge cut off by incising, breaking, and grinding (Plate XIX, figure 14)
Worked (?) piece of grey slate
Three pendants, each made by perforating the canine tooth of a bear (Plate XIX, figures 5–7)
Pendant made by perforating and incising an incisor tooth of a moose (Plate XIX, figure 8)
Incisor tooth of a moose with root ground to wedge shape (Plate XIX, figure 9)
Fragment of a pendant made by perforating a canine tooth (Plate XIX, figure 10)
Pendant made by perforating the canine tooth of a seal (Plate XIX, figure 11)
Toe bone of a moose with a hole gouged in the far end (Plate XIX, figure 13)

Some of the Items in this List of Objects from Shell-heap A Have Been Totalled as Follows

Fifty-one specimens chipped from metargillite, which was used only for points, not for scrapers
Thirty-eight specimens of metargillite in process of manufacture
Three finished points of quartz and quartzite
Fifty-five points chipped from stone, including some objects in the above totals
Eight products chipped from quartz and quartzite, including the three finished points mentioned above
Thirty-eight+ evidences of the source of quartzite, eleven chips, and one reject, or a total of fifty+evidences of manufacture of quartz and quartzite
Fifty-eight specimens of celts
Eighty-seven awls made of bone (Plate XVII)

APPENDIX II

The following collections, catalogued under Nos. VIII-B-32, VIII-B-469 to VIII-B-474, were made on the surface of the beach in front of shell-heap D, where they had probably been washed from the heap by the surf. Mr. W. J. Wintemberg found in 1913:

A celt made of stone used as a hammer (*see* under hammers or celts made of stone)

In 1914 was found:

A triangular point chipped from metargillite
A tip of a point chipped from metargillite
A triangular, leaf-shaped point chipped from quartzite
Two celts in process of manufacture, one being chipped and the other chipped, pecked, and rubbed
A celt with head missing

On the surface of heap D was found:

A celt made of stone

In excavating in the heap we collected the following specimens, which are catalogued under Nos. VIII-B-476 to VIII-B-667:

Oyster shells
Shells of quahog
Shells of the soft-shelled clam
Shells of the mussel
Shells of the horse clam
Shell of a periwinkle
Basket shells
Moon shells
Boat shells
Spotted land snails
Pieces of charcoal
Piece of specular iron
Broken nugget of hematite
Toe bones of moose
Large and small fragments of the large bones of large mammals, some of them probably of the moose
Small fragments of bones
Toe bones of small mammals
Vertebræ of the white whale
Teeth of the woodchuck
Incisor teeth of the porcupine
Eight incisor teeth of beaver
Molar teeth of beaver
Molar teeth of moose
Molar teeth of walrus
Canine teeth of seal
Tooth of a large mammal
Canine teeth of small carnivorous animals
Teeth, and pieces of jaws of wolf or dog
Four molar teeth of bear
Five split bones of moose
Five crude, heavy, triangular to leaf-shaped points chipped from metargillite (Plate IV, figures 1, 2)
Nine crude, small, triangular to leaf-shaped points chipped out of metargillite
One crude, tanged, nearly lozenge-shaped point chipped from metargillite
One large, tanged point chipped from metargillite (Plate IV, figure 9)
One notched point chipped from metargillite
Six tips of points chipped from metargillite

Three points chipped from metargillite, from which both tips and bases are missing
Three bases of points chipped from metargillite
A tanged point chipped out of quartz (Plate IV, figure 12)
A point with point shorter than tang, chipped out of maroon-coloured quartzite (Plate IV, figure 7)
A tanged point chipped from pink quartzite (Plate IV, figure 13)
Two chips of pebbles of metargillite (Plate III, figure 5)
One chip of a celt chipped on the broken surface
One large broken reject or crude blade chipped from metargillite
Six rejects chipped from metargillite (Plate III, figure 12)
A leaf-shaped object chipped from chalcedony—reject or point (Plate III, figure 13)
Thirty-six pieces of quartz or quartzite pebbles; part of them are small pebbles from which a piece had been chipped, others are pieces showing part of the pebble surface
Four pieces of quartz or quartzite from which pieces have been chipped
Two chips of quartz or quartzite
Three chipped pieces of quartz or quartzite, apparently rejects
One harpoon head made of bone, barbed on one side (Plate VI, figure 12)
Seven broken harpoon heads made of bone, barbed on one side (Plate VI, figure 14)
One barb cut from a harpoon, made of bone (Plate VI, figure 19)
Fragment of a large object made of a whale rib, with red colour on one end (Plate VII, figure 13)
Fragments of pottery, some tempered with fragments of shell (Plate VIII, figure 6, and Plate IX, figure 3)
Fragment of a pot with a conical base
Fragments of pottery (some illustrated on Plate VIII, figure 11, Plate IX, figures 4, 5, Plate X, figure 27, and Plate XI, figure 12)
Fragments of a pottery dish (Plate VIII, figure 12, and Plate XI, figure 1)
Fragments of pottery marked with rocking stamp (Plate X, figures 14, 15)
Fourteen fragments of adzes made of stone
Small celt or chisel made of a pebble with cutting edge broken
Five adzes made of stone
Six fragments of adzes made of stone
An adze made of stone, with grooved sides
Six adzes made of stone
Small, double-bitted adze made of stone
Object made of an oval, flattened pebble
Three large rubbed stones
Nine small rubbed stones
Pebble in process of manufacture into an artifact
Four whetstones
Fragment of slate with scratched surface
Four hammerstones
Stone with grooves
Stone with a groove on one side, in process of manufacture into an artifact
Nineteen knives made of incisor teeth of the beaver (some illustrated on Plate XVI, figures 16, 17, 20, 22, 23, 27)
Five knives made of incisor teeth of the woodchuck
Molar tooth of a beaver, with root end rubbed (Plate XVIII, figure 16)
Four scrapers chipped from jasper (Plate XVII, figure 1)
Seven scrapers chipped from white quartz (Plate XVII, figure 2)
Two awls made of bone (Plate XVII, figure 4)
Thirty-four fragments of awls made of bone
Six fragments of awls made of the splint bone, probably of the moose
Awl made from ulna of a small mammal
Seven small objects made of bone and one made of canine tooth (Plate VII, figure 7)
Implement made of bone
Fragment of a pointed implement made of antler
Spatulate pebble
Rubbed piece of slate with a deep groove on one side
Twenty-three bones of mammals showing signs of being artificially shaped
Toe bone of carnivorous animal with two cuts across it near one end
A worked piece of bone of a sea mammal
Four cut and broken bones of birds
Two canine teeth of bear showing working
Three pieces of antler showing working
Fragment of bone showing parallel marks (Plate VII, figure 12)
Fragment of bone with longitudinal and oblique incisions
Toe bone of a moose with a hole broken in one side
Implement made of bone of a sea mammal
Three worked bones of mammals
One worked bone of a bird
Rubbed pebble of ferruginous argillite (Plate XIX, figure 1)
Rubbed piece of ferruginous argillite (Plate XIX, figure 2)

Rubbed piece of graphitic schist and argillite (Plate XIX, figure 4)
Toe bone of a moose with hole gouged in far end (Plate XIX, figure 12)
Fragment of a flat, oblong pebble with incised marks on both sides (Plate XIX, figure 15)
Curved object made of antler (Plate XIX, figure 20)

Some of the Items in this List of Objects Excavated from Shell-heap D Have Been Totalled as Follows

Twenty-nine specimens of points of metargillite
One point of quartz and two of quartzite
Thirty-two points chipped from stone, including those above mentioned
Ten specimens of metargillite in process of manufacture into chipped points
Forty-five specimens of quartz and quartzite in process of manufacture into points or scrapers, there being a total of three points and seven scrapers or a grand total of ten

APPENDIX III

The following collections, catalogued under Nos. VIII-B-699 to VIII-B-731, were made in shell-heap L:

Quahog shell
Charcoal
Bone
Molar tooth of a beaver
Incisor tooth of a beaver
Large piece of bone of a sea mammal
A leaf-shaped point chipped from metargillite (Plate IV, figure 6)
A notched and barbed point chipped from metargillite
Three tip fragments of points chipped from metargillite
A point broken in process of chipping from metargillite
A crude reject chipped from metargillite
A chip of chalcedony
A chip of quartzite
A fragment of a pebble of quartzite
Simple point made of bone
Fragments of points or awls made of bone
Fragment of a harpoon point with barbs on one edge, made of bone
Fragment of an unfinished harpoon point with barbs on one side, made of bone
Harpoon point with six barbs on one side, made of bone (Plate VI, figure 7)
Fragments of pottery
Two celts made of flat oval pebbles (Plate XII, figure 6)
Rubbed stone
Whetstone
Flat oval pebble, possibly an artifact
Knife made of an incisor tooth of a beaver
Point, awl, or needle made of copper (Plate VII, figure 4)
Large piece of worked schistose slate
Two pieces of stone from which a piece has been removed by grooving and breaking

APPENDIX IV

The following collections, catalogued under Nos. VIII-B-732 to VIII-B-804, were made in shell-heap M:

Iron ore
Oblong pebbles
Charcoal
Quahog shells
Oyster shells
Moon shells
Fish bones
Claw bone
Ulna
Toe bone
Vertebræ of a seal
Canine tooth of a seal
Canine tooth of a walrus
Molar teeth of moose
Four broken incisor teeth of beaver
Five molar teeth of beaver
Two left lower jaw bones of dogs
Teeth of the wolf or dog
Fragment of a very thick bone, probably a rib of a white whale
Fragments of charred bones
Ten crude, leaf-shaped points chipped from metargillite
A tanged point chipped from metargillite
Five notched points chipped from metargillite (Plate IV, figure 20)
Five tip fragments of points chipped from metargillite
A barbed point chipped from metargillite, with tip lacking
Two base fragments of points chipped from metargillite
A tang fragment of a point chipped from metargillite
A middle fragment of a point chipped from metargillite
Two chips of points chipped from metargillite
Two pieces of metargillite
Seven pieces of metargillite from which some had been chipped
Nine chips of metargillite (Plate III, figure 6)
Two rejects chipped from metargillite
A notched point chipped from grey quartzite
A tip fragment of a point chipped from maroon quartzite
A barbed point chipped from maroon quartzite, with tip lacking
A lozenge-shaped object chipped from quartzite (Plate III, figure 14)
A tanged point of white and pink chalcedony
Ten small chipped pebbles of quartzite
Six chips of pebbles of quartzite
A pebble apparently partly chipped to the form of a point
Two leaf-shaped objects chipped from quartzite (Plate III, figure 14)
A point broken from a large implement made of bone or antler (Plate VII, figure 10)
Eleven fragments of simple points made of bone
Three fragments of harpoon points barbed on one edge, made of bone (Plate VI, figure 18)
Fragments of pottery (Plate X, figure 8, and Plate XI, figure 4)
Small adze, made of stone, battered on the head and chipped or battered on the side edges
Adze made of a sandstone pebble, sharpened at one end to an almost keen convex cutting edge; curved sidewise, so that the object certainly was an adze
Double-bitted adze made of stone (Plate XIII, figure 5)
Longitudinal fragment of the head of an adze made of schistose slate, with sides, edge, and end of the head rubbed rather smooth
Bit fragment of adze made of stone
Fragment of adze made of stone, 9 inches long, nearly lenticular in cross-section, with edge slivered off on one side apparently from use
Large rubbed stone
Whetstone
Hammerstone
Stone grooved in process of manufacture
Three knives made of incisor teeth of beaver
Fragment of awl made of bone
A sharpened tip broken from a trough-shaped point for a spear or awl made of thin-walled bone, apparently that of a bird
Basal fragments of awls made of bone

A piece of bone or antler broken off at both ends, lath-shaped, like the shaft of a point for an arrow or harpoon, with a sharp slit in each edge running deeper and deeper to the broken end

A fragment of bone of a sea mammal with one edge rounded, the other broken, showing one end cut off by breaking after grooving all round except across the broken edge

Four pieces of worked bone

Unfinished awl made of bone

Rocking stamp or pendant made of bone or antler decorated with incisions and notches (Plate XIX, figure 19)

Some of the Items in this List of Objects from Shell-heap M Have Been Totalled as Follows

Twenty-eight points chipped from metargillite

Twenty pieces of metargillite in process of manufacture

Three points chipped from quartzite

Thirty-two points chipped from stone, including some objects in the above totals

Nineteen pieces of quartzite in process of manufacture

Thirty-nine pieces of stone in process of manufacture, including those above mentioned

APPENDIX V

The following collections, catalogued under Nos. VIII-B-805 to VIII-B-828, were made in shell-heap N:

West of the south point of the island:

Fragment of pottery
Argillite pebble chipped off at both ends, apparently to square the edge, and rubbed on both sides of the end and on one side of the other end as if to make it into a celt

East of the point:

Rubbed piece of iron ore
Fish bone
Bone of a rabbit
Jaw of a small mammal
Piece of charred bone
Rib broken off at the ends
Broken incisor teeth of the beaver
Canine tooth of a seal
Toe bone of a moose
Molar teeth and pieces of lower jaw of moose
A point chipped from metargillite, with the butt unfinished
A longitudinal quarter chipped from a small quartz pebble
Part of the shaft of a simple point or awl made of bone
Twenty fragments of pottery (Plate IX, figure 2)
Two fragments of adzes made of stone, one a head end, the other a bit
Argillite pebble slightly rubbed, as if in process of manufacture into a celt
Knife made of an upper incisor tooth of a beaver (Plate XVI, figure 24)
Small implement made of bone (Plate VII, figure 6)
Worked bone
Piece of whittled bone
Piece of bone cut off by longitudinal grooving
End broken from an object made of a longitudinal strip of heavy bone whittled off on the outside at the joint end, as with a large sharp flake of stone, and smooth on side edges
Fragment of bone showing where it was cut off by longitudinal grooving
Cut tip of antler

THE EISENHAUER SHELL-HEAP, MAHONE BAY, NOVA SCOTIA

By

W. J. Wintemberg

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Illustrations

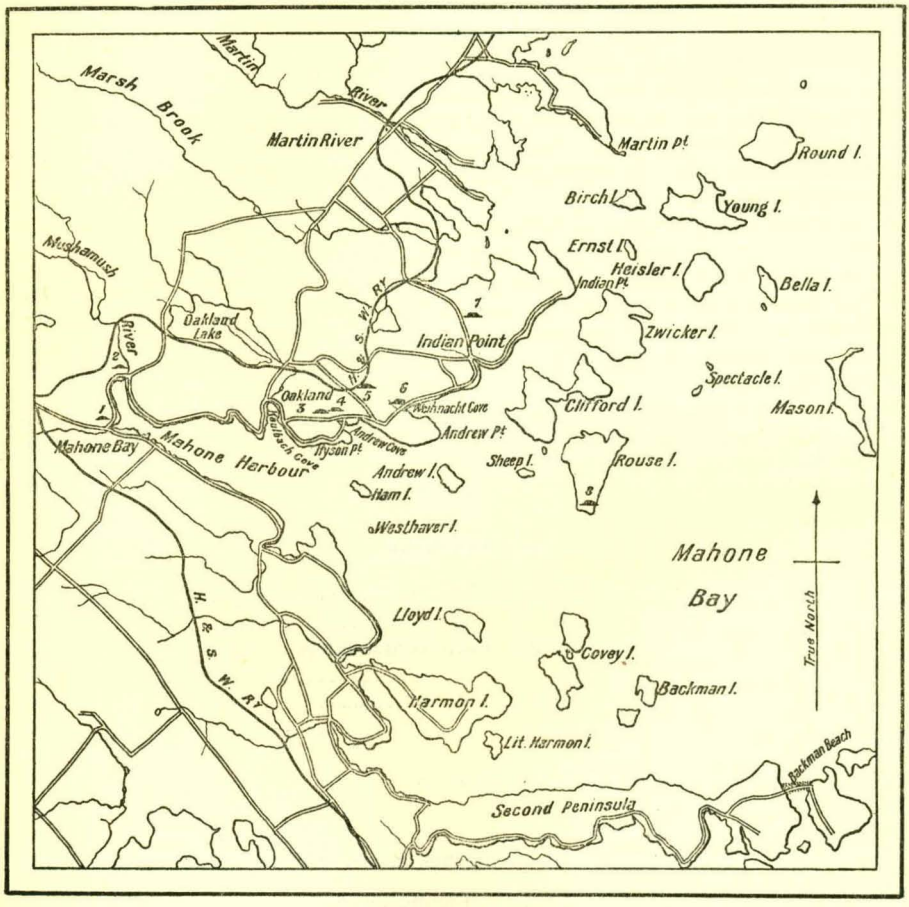

FIGURE 2
Showing location of the
EISENHAUER and other SHELL-HEAPS on
MAHONE BAY
NOVA SCOTIA

Shell-heap

¼ ½ ¾ 1 2 3 4

SCALE
Miles

THE EISENHAUER SHELL-HEAP, MAHONE BAY, NOVA SCOTIA

INTRODUCTION

The Eisenhauer shell-heap is one of several small shell-heaps on the shore of Mahone bay, Lunenburg county, on the south coast of Nova Scotia, about 70 miles west of Halifax. It is on land owned by Mr. James Eisenhauer, on the north side of the road, between the villages of Mahone Bay and Indian Point, and about 1½ miles west of the latter place (Figure 2 and Plate XXII). It was entirely excavated by the writer as part of the archæological work of the Geological Survey, Canada, in September, 1913.

Thanks are due to Dr. Charles A. Hamilton, of Mahone Bay, for information about the discovery of the shell-heap; to Mr. James Eisenhauer for permission to excavate on his property; to E. R. Faribault and Eugene Poitevin, of the Geological Survey, for determinations of the rocks and minerals; to Dr. George F. Eaton, Curator of the Osteological Department, Peabody Museum of Natural History, Yale University, for identifying most of the mammalian and fish remains; to Dr. Gerrit S. Miller, Curator of the Department of Mammals, U.S. National Museum, for identifying the deer remains, and to Dr. Alexander Wetmore, of the Bureau of Biological Survey, U.S. Department of Agriculture, for identifying the bird bones.

PHYSICAL FEATURES, TIMBER, ETC.

The country surrounding the Eisenhauer shell-heap is rugged and most of the high land is covered with glacial boulders. North of the shell-heap is a hill that runs parallel with the shore and ends in the promontory known as Andrew point, south of Weihnacht cove. A salt marsh on the south, where canoes could land safely, may at one time have been an extension of the cove. It has a sandy bottom, such as is the usual habitat of the most numerous species of clam found in the heap, the abundance of which was probably an inducement to select this place for habitation. Red oak, birch, red pine, black and white spruce, and several varieties of small trees and shrubs flourished here. The wild black cherry and choke-cherry were also seen.

SHELL-HEAPS IN THE VICINITY

Besides the Eisenhauer heap there are several other shell-heaps on Mahone bay and harbour (Figure 2).

(1) In a yard north of the Presbyterian church, in the village of Mahone Bay.

(2) On the west bank of Mushamush river, on the farm of John Keddy.

(3) A small, shallow heap in William Hyson's woods, a few hundred yards west of the Eisenhauer heap.

(4) The Eisenhauer shell-heap.

(5) A small heap on the Weihnacht farm.

(6) A deep heap on the shore of Weihnacht cove.

(7) On property owned by C. P. Thomas, about half a mile north of the village of Indian Point.

(8) On the southeast side of Steves or Rouse island.

EISENHAUER SHELL-HEAP

This shell-heap, which is about 25 by 80 feet in extent, with a maximum height of 22 inches, is situated on a small knoll on a narrow bench, sloping to the east, south, and west, a few hundred feet from the shore of Andrew cove (Plate XXII B). The site has a southern exposure and is well sheltered from west and north winds. Most similar sites that the writer has seen in the Maritime Provinces have southern or eastern exposures[1].

The place was cleared, but not ploughed. A channel-like depression at the west end of the heap, judging from the nature of the soil and the character of the vegetation, may have been the bed of a small stream having its source in the hill at the back. The shells extended into a marshy area at the east.

About 1908, in making a new road from Kaulbach cove to Indian point, a cut several feet deep was made across the south side, exposing the shells throughout the east and west length of the heap, and about one-fourth of the heap was removed.

There was no evidence of different periods of deposition of shells. The deposit was mainly a homogeneous mass of shells and black refuse, except for small pockets, streaks, and layers of sand and ashes. In one spot near the centre of the heap were two layers of ashes separated by a thin layer of black soil, the lower layer about 15 feet long, 5 feet wide, and 4 inches thick. The shells were all chalky in appearance and some were very fragile. Most of them, especially those near the surface, were crushed and somewhat disintegrated. The shells rested on a layer of black soil from 2 to 6 inches deep and this in turn lay on the hardened yellow drift on which the heap was formed. The accumulation of shells and other refuse—even if the place had been occupied for only a short time during several successive years—was a matter of only a few years. Groups of stones were found at the bottom in places that may have been the floor of fire-places, but very few of them exhibited any signs of having been subjected to fire. Even in the ash beds none of the stones appeared to have been burnt. Stones scattered elsewhere through the heap were discoloured and appeared to have been burnt, but they were not as numerous as burnt stones at village sites in Ontario.

This site was probably a temporary camp occupied only during the spring, summer, and autumn, for the purpose of gathering and drying shell-fish for winter consumption at a village in the interior. Lescarbot states that the Micmacs were in the habit of retiring to the interior in winter and encamping on the shores of lakes[2], but more will have to be learned of the archæology of the region before it is known whether or not there were such inland camp sites.

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[1] Dr. Henry C. Mercer, referring to shell-heaps on York river, Maine, says "they invariably front the water to the south or east". ("An Exploration of Aboriginal Shell-heaps Revealing Traces of Cannibalism on York river, Maine," reprinted from Publications of the University of Pennsylvania (1897), vol. VI, p. 128.)

[2] Lescarbot, Marc: "La Conversion des Savvages qui ont esté Baptises en la Nouvelle France", cette anne 1610, Jesuit Relations (Burrows edition, vol. I, p. 83). Also, by the same author, "History of New France", Publications of the Champlain Society (Toronto, 1914, vol. XI), vol. III, p. 220.

AGE OF THE SHELL-HEAP

The heap is considered to be prehistoric because only aboriginal artifacts were found in it. The occurrence of bones of the deer, an animal not recorded in Nova Scotia until 1888, and the fact that neither Lescarbot (circa 1610)[1] nor Denys (circa 1653)[2], two of the earliest chroniclers, mention its presence in the country, indicates a considerable antiquity for the heap. The presence of two bones, in a fragmentary condition, which could only be identified as possibly those of a domestic pig or a young colt, does not affect the age, as the bones were probably recently introduced into the heap.

RESOURCES OR MATERIALS USED BY THE PEOPLE

Food. The heap was composed almost entirely of shells of the soft-shelled clam *(Mya arenaria)*, but ten other varieties of sea-shells and three shells of the land snail *(Helix hortensis* Müller) were found. In order of abundance they are: scallop *(Pecten magellanicus)*, of which fifteen were found; razor clam *(Ensis directus)*; hen clam *(Spisula solidissima)*; oyster *(Ostrea virginica)*; quahog *(Venus mercenaria)*; mussel *(Mytilus edulis)*, now abundant in the vicinity; moon shell *(Lunatia heros)*; rock purple or dog winkle *(Purpura lapillus)*; waved whelk *(Buccinum undatum)*; and a burnt fragment of a small, unidentified species of bivalve. The land snails may have been used as food, or they may be intrusive, though the shells have the same appearance of age as the other shells in the heap[3].

Among the shells and in the black layer at the bottom were found the bones of different animals used for food. Nearly all were more or less fragmentary, but otherwise fairly well preserved. All the larger shaft bones were broken, possibly for the sake of the marrow or to adapt them to the size of the pot in which they were boiled. A few of the bones were scorched by fire.

The bones, teeth, and antlers have been identified as those of the following mammals, given in order of abundance: moose *(Alces americanus)*; Virginia deer *(Odocoileus americanus)*, of the former presence of which here there is only archæological evidence; beaver *(Castor canadensis)*; otter *(Lutra canadensis)*; dog *(Canis familiaris)*; bear *(Ursus americanus)*; harbour seal *(Phoca vitulina)*; raccoon *(Procyon lotor)*; lynx *(Lynx canadensis)*; woodland caribou *(Rangifer caribou)*, apparently rare when the heap was formed, and it is represented by only a few doubtful remains; porcupine *(Erethizon dorsatum)*; woodchuck *(Marmota monax)*; muskrat *(Ondatra zibethica)*; hare *(Lepus* sp.); wolf *(Canis lycaon)*; and fisher *(Martes pennanti)*.

Bones of several species of birds were found, only a few of which can be identified. These are of the loon *(Gavia immer)* and northern eider *(Somateria mollissima)*.

[1] Op. cit.

[2] Denys, Nicholas: "Description and Natural History of the Coasts of North America (Acadia)"; translated by W. F. Ganong, Publications of the Champlain Society (Toronto, 1908, vol. II).

[3] See the writer's "Archæology as an Aid to Zoology", The Canadian Field-Naturalist, October, 1919, v XXXIII, No. 4, p. 65.

Only four fish bones were found, one being the preoperculum of a sculpin, possibly *Myoxocephalus groenlandicus.*

No vegetal food was found.

Rocks and Minerals. Iron pyrites, limonite, two small copper nuggets, and worked pieces of chert, chalcedony, jasper, quartz, quartzite, schist, and argillaceous, micaceous, schistose, and siliceous slate, besides some undetermined kinds of rocks were found. Some of these rocks occur as pebbles on the shore of the cove and others in the glacial drift of the neighbourhood; native copper is said to occur in boulders of trap rock.

Plant Materials. There were charcoal and pieces of birch bark, which owe their preservation to partial charring.

The charcoal occurred mostly in the black layer below the shells. Some pieces of charcoal look as if the wood had been oak. Cord impressions on pottery suggest that vegetal fibres were used.

Animal Materials. Evidence was found that bone, antler, and teeth were used as material for artifacts. Although there was an abundance of shells, not a single artifact was made of this material; in fact, shell artifacts are rare in shell-heaps along the northern Atlantic coast. There were twenty-five artifacts made of bone, and eleven pieces showing cutting. An artifact made of antler, a piece in process of manufacture, another piece showing cutting, and several unworked pieces, were found. The incisors of the beaver, porcupine, and woodchuck were made into cutting tools, and canines of the bear and wolf were perforated for suspension as ornaments.

SECURING OF FOOD

Implements used in securing food were confined to stone and bone points for arrows, and bone points for harpoons, used in hunting and fishing. There were also many specimens illustrating the manufacture of the stone points.

Points Chipped from Stone. Twenty-four points chipped from stone for arrows and knives were found. Fifteen of these have the tips missing and two are tips of broken points. The various kinds, from the crude leaf-shaped form to the notched and stemmed point, are illustrated in Plate XXIII. Five are made of quartz, five of quartzite, three of jasper, six of chert, and five of siliceous slate. Nine are stemless or leaf-shaped forms, some of which may have been points for knives. Perhaps they are all incipient points purposely left in this state for further specialization. One (figure 1), chipped from quartz, may also have been used as a blade for a scraper. The points illustrated in figure 2 (symmetrical and crudely chipped from chert), figure 3 (asymmetric and chipped from siliceous slate), and figure 4 (asymmetric and chipped from jasper), have rounded bases. Figure 5 shows an asymmetric point, with a nearly straight base, chipped from quartz. The point in figure 6 has the width of the basal part slightly reduced by chipping, as if to produce a stem. Thirteen points have stems. The crude asymmetric point with the tip missing, chipped from quartz (figure 7), is concave on both edges, producing a

stemmed rather than a shouldered form. Figure 8 represents the only perfect stemmed point found here. It is symmetric, shouldered but not barbed, with convex base, and is chipped from fine-grained, light brown quartzite. The slightly asymmetric point with the tip missing, chipped from jasper, seen in figure 9, has small, sharp barbs and a straight base. That in figure 10, also with the tip missing and a straight base, has long barbs and is chipped from dark grey siliceous slate. The notching of the imperfect symmetric point, chipped from light brown quartzite (figure 11), is very neatly done. These imperfect points may all have been broken in the making. The point in figure 12, chipped from grey chert, was broken and refashioned. The rechipping produced a straight chisel edge, however, rather than a pointed tip. None of the points has serrated or bevelled edges.

Manufacture of Points Chipped from Stone. The manufacture of points for arrows and knives is illustrated on Plate XXIV. Figures 1 to 10 illustrate progressive steps in manufacture. Figure 1 represents a quartz pebble on which chipping was commenced at one end, probably by striking it with or on another stone. In figure 2 two long pieces are broken off one side of the pebble. Figure 3 illustrates further advance. Figure 4 shows a large fragment retaining the waterworn outer surface of the pebble on one side, whereas the other side shows both primary and secondary chipping. Figure 5 shows the chipped face of another fragment. The specimen illustrated in figure 6 is a crude, thick, somewhat orbicular, roughed-out form, and may have been a reject, the chipping having proceeded far enough to show that further work was useless. Figure 7 represents a thick, leaf-shaped form, retaining part of the original waterworn surface of the pebble at one end, on which chipping has progressed far enough to suggest the ultimate form. The progression is still further apparent in figures 8, 9, and 10, culminating in more or less crude leaf-shaped specimens, like that on Plate XXIII, figure 5. These required very little elaboration to transform them into points for arrows, but they may have been knives.

A diminutive, symmetrical, leaf-shaped form chipped from quartz (Plate XXIV, figure 11) is introduced here on account of its small size. It was probably rejected because it was too thick to be shaped into a point for an arrow. Figure 12 shows a crude, leaf-shaped form, possibly a reject, chipped from grey chert, and the profile in figure 13 shows its asymmetry.

Bone Points for Arrows and Spears. Only two specimens made of bone were found which can be considered as points for arrows. The flattened bone point, with tip missing (Plate XXIII, figure 13), was possibly fastened to the arrow shaft in the manner shown in figure 14, one edge being inserted into a narrow, longitudinal groove in the shaft and lashed in place with a thong or sinew, the pointed end of the broader part in that case projecting from the side as a barb. A slender, simple point, retaining the natural medullary hollow on one side (figure 15), may have been inserted into a hole at the end of the arrow or spear shaft. A few of the pointed pieces of bone considered under awls, especially the specimens illustrated on Plate XXXI, figures 15, 17, may have been points for arrows or spears.

Unilaterally Barbed Bone Points for Harpoons. The fragment seen on Plate XXIII, figure 16, of what was probably the basal end of a point for a harpoon, is round in cross-section and on one side has a prominent mid-rib which may have extended the full length of the specimen. This mid-rib bears four shallow notches. Two fragments of what appear to be unfinished, unilaterally barbed bone points for harpoons were also found (figures 17, 18). They both have a line hole near one edge of the basal end as in harpoon points of the Eskimo.

Bilaterally Barbed Bone Point for Harpoon. The slender bone point, $4\frac{3}{16}$ inches long (figure 19), has a row of four blunt and much worn barbs along the middle of each edge.

Fish-hooks. Some of the smaller, pointed bone objects considered as awls, as that illustrated on Plate XXXI, figure 12, may have been used as barbs for fish-hooks.

Net Sinkers. No notched pebbles suggesting use as net sinkers were found.

PREPARATION OF FOOD

Some points chipped from stone, possibly used as knives, a stone on which food may have been crushed, and fragments of pottery were found.

Knives. Some of the points chipped from stone (Plate XXIII, figures 1-6) may have been used as points for knives.

Stones on Which Food Was Crushed. No hollowed stone mortars or pestles were found. The abrasions on the flat surface of the large stone on Plate XXVII, figure 2, possibly resulted from cracking on it nuts and like plant foods. Animal bones may also have been broken on this stone to fit into cooking pots or to expose the marrow. The stone hammer seen on Plate XXX, figure 3, may have been used for cracking nuts, crushing seeds, and breaking bones.

Pottery. No whole pots were found. Fragments of pottery were more numerous than any other kind of artifact, seven hundred and forty-three pieces being found in the heap at depths of from 3 to 18 inches. These probably represent two hundred and twenty different pots, twenty-seven pots being represented by fragments of rims. There are as many as eighty fragments belonging to one pot.

Judging from the curvature of some of the fragments, the pots ranged in size from those 3 inches in diameter and holding perhaps half a pint, of which there were five, to some with a capacity of more than 2 gallons. The greatest thickness of the ware is about half an inch, the least about one-fourth of an inch, but most of it is about three-eighths of an inch thick.

All the pots seem to have had rounded bottoms. The rims of some were straight, others were slightly everted, and some had a slight lip (text Figure 3). The neck of only one pot, Plate XXVII, figure 1, and text Figure 3 *d* was markedly constricted. The edges of the rim are sometimes squared off as in figure *b*, and sometimes rounded off as in *c*. None of the pots had handles or perforations through the rim for suspension.

Two fragments, one illustrated on Plate XXV, figure 8, are perforated, probably in order to bind the broken parts together after the pot was broken.

A few fragments are encrusted on the inside surface with a black substance, evidently the carbonized remains of the food formerly cooked in them.

Most of the fragments are light buff or light reddish brown. Others are dark grey. Some have the inside surface blackened.

Some of the fragments are smooth, but not polished, and others are coarse and gritty to the touch. Both the inside and outside surfaces of many of the pots seem to have been coated with a thin layer of fine clay paste.

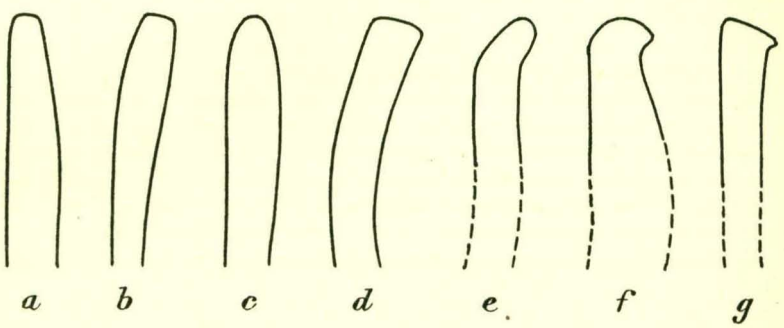

FIGURE 3. Cross-sections of rims of pots.

The material used in the manufacture of the pottery was clay without tempering, or a paste tempered either with crushed shell or small particles of quartz, feldspar, mica, and sand. Out of the total, seven hundred and forty-three fragments, two hundred and seventy-five, or 37 per cent, contained shell tempering, and two hundred and ninety-eight, or 40 per cent, stone tempering. The tempering material in the rest of the fragments, if there is any, cannot be determined. Angular depressions in some pieces, however, may have held pieces of shell, which decayed or became loosened and fell out (Plate XXV, figure 3, and Plate XXVI, figures 16, 17). None of the fragments has both shell and stone tempering. In many fragments (Plate XXV, figure 1) the shell tempering consists of large, angular pieces. One of the pieces in another fragment is as much as $\frac{3}{8}$ inch long by $\frac{1}{4}$ inch wide. In only a few fragments is the shell very finely pulverized. The species of shell is not recognizable, although some pieces seem to be those of the soft-shelled clam.

Most of the ware with shell tempering seems on the whole as firm as that tempered with stone. The fractured edges of a few pieces are much abraded and rounded, showing the softness of some of the ware. The pieces without any sign of tempering are hard and firm. Some pieces look almost as if they had been beach-worn. No pottery fragments were found on the slope of the exposed part of the shell-heap, which suggests that they disintegrated rapidly after exposure.

The suggestion made by Loomis and Young, in speaking of pottery from the shell-heaps of Maine[1], that stone-tempered ware was probably made in the interior of the country and brought to the coast, may be correct, although here some of the tempering ingredients occur naturally in the vicinity of the Eisenhauer shell-heap. All the pottery with shell tempering found in this shell-heap may have been manufactured on the spot. It would be interesting to know if any shell-tempered ware is found on sites in the interior.

One hundred and thirty-eight fragments, or more than 18 per cent of the whole number found, belonging to about seventy-nine different vessels, are fragments of pots made by coiling. In the rest of the fragments the method of making is not so clearly shown. Some of the fragments that do not show coiling possibly belong to vessels that were modelled from a mass. In fifty-nine, or 43 per cent, of the fragments of coiled ware the tempering material is shell; in thirty-four, or 25 per cent, stone; and in forty-five, or more than 32 per cent, the tempering is not recognizable. The largest proportion of coiled ware, therefore, contains shell or no recognizable tempering at all, which suggests that it was perhaps more difficult to form stone-tempered clay into rolls or strips suitable for coiling. The broken edges of the fragments of coiled ware, which follow the lines of welding of the coils, are either straight, slanting (Plate XXV, figure 3), convex (Plate XXV, figure 4), or concave. Some of the strips or coils were from about ½ inch to 1½ inches wide (Plate XXV, figures 5, 6).

The inside surface of two hundred and sixty-one fragments, or a little more than 35 per cent of all the fragments found, and probably representing about ninety-eight different pots, are scarified or scratched with some rough surfaced or toothed tool, or perhaps a twig brush (Plate XXV, figures 3, 6). This was probably a welding process. Seven of these scarified pieces have shell tempering, which is only about 3 per cent of the total number of fragments with shell tempering. One hundred and ninety-five pieces have stone tempering, which is more than 65 per cent of the total number of fragments with this kind of tempering, and about 75 per cent of the total number of scarified fragments. Fifty-nine other fragments have no recognizable tempering, which is about 35 per cent of the total number of fragments of untempered ware. It will be seen that by far the largest number of scarified pieces have stone tempering[2]. Whatever the purpose of the scarifying may have been, it is likely that the stone-tempered and the apparently untempered ware required this treatment more often than that tempered with shell. Although plainly intentional, the scratches form no regular pattern and were not ornamental; besides, being almost exclusively on the inside of the pots, they could not be seen. On some pieces the scarifying extends almost to the top of the rim and some of the scratches are quite deep and fully an eighth of an inch wide. Only one of the fragments shows any scarifying on the outside surface.

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[1] Loomis, F. B., and Young, D. B.: "On the Shell-heaps of Maine"; Am. Jour. Sci. (New Haven, 1912), vol. XXXIV, p. 38.

[2] Algonkian ware from Ontario, which is all tempered with stone, is similarly, though less frequently, scarified. Out of one hundred and ninety-five fragments from a site near Casselman, Russell county, in the Museum, sixty-one, or more than 30 per cent, are so treated.

Three hundred and twelve fragments (including nine pieces of rims), or 42 per cent of all the fragments, have no ornamentation on the outside. It would be difficult to determine what proportion of these plain pieces formed part of the same vessels as the decorated fragments. One hundred and seventy-three, or 56 per cent of the plain fragments, representing probably sixty-five different vessels, are tempered with shell; fifty fragments, or 16 per cent, probably representing twenty-one different vessels, show stone tempering, and eighty-nine fragments, or 25 per cent, and probably representing twenty-four different pots, have no recognizable tempering material. Although 63 per cent of the total number of fragments containing shell tempering lack ornamentation, it is hardly probable that the pottery tempered with stone was more readily ornamented than that tempered with shell. May not this lack of ornamentation of a large proportion of shell-tempered ware, therefore, be due to the fact that it was made on the coast, where the potters perhaps had less time for æsthetic treatment than they had in the interior, where the stone-tempered pottery may have been made?

The decoration of the pottery from this shell-heap is not very elaborate, neither is there a great variety of patterns. Many of the pots seem to have had the entire outside ornamented. Decoration was confined to round and angular depressions made with a stylus, trailed or impressed lines produced with pointed or blunt tools, and patterning with cord-wound twigs. Sometimes all three methods of decoration occur on one pot. None is decorated with a rocking stamp. None has impressed circles like those on pottery from the Roebuck site, in Grenville county, Ontario. There is also no finger-nail decoration, although one fragment shows on the inside distinct impressions of the nail of the potter (Plate XXV, figure 7).

Fourteen fragments, representing twelve different vessels, are decorated with stylus impressions. In three fragments, belonging to two different pots, this is the only kind of decoration (Plate XXV, figure 12). In twelve fragments it occurs in combination with patterns produced with cord-wound twigs (Plate XXV, figures 11, 13, 14, Plate XXVI, figures 1, 7, 15, 16, and Plate XXVII, figure 1), four of these having in addition impressed lines (Plate XXV, figures 21, 22). A few fragments have the impressions or pits arranged in a crude pattern (Plate XXV, figure 12). Most of the round pits were produced with an obtusely pointed stylus, whereas the angular pits seem to have been made with some crude unfinished tool, probably of wood. In one fragment the pits are very deep, one of them nearly penetrating the wall of the pot (Plate XXV, figure 11).

Only ten fragments, belonging to seven different vessels, bear impressed lines. Eight of these had other decoration. In three fragments of one pot (Plate XXV, figure 15) the lines look as if a cord-wound twig had been dragged along sidewise, producing an almost continuous line. In other fragments (Plate XXV, figure 16) short linear depressions seem to have been made in a similar way. In the fragment illustrated on Plate XXV, figure 19, the lines are deep and narrow and look as if they had been made with some sharp-edged tool. In a few other fragments, as on Plate XXV, figure 20, the impressed lines are combined with patterns made with cord-wound twigs and stylus impressions. In five fragments,

apparently belonging to two different pots, some crude blunt tool (probably a rough piece of wood, or even the cord-wound twig itself, judging from the striæ which remain) was drawn along over the top of the rows of cord impressions (Plate XXV, figures 21, 22).

The most common form of decoration consists of impressions made with cord-wound twigs, producing horizontal, vertical, diagonal, zigzag, and radiating or fan-like patterns. Probably all of these were produced either with a straight twig spirally wound with a cord or with a hoop-like or looped twig, similarly wound. On some fragments the cord impressions have been partly effaced by subsequent smoothing.

One hundred and thirty fragments, representing seventy-four different pots, appear to have been decorated with the straight cord-wound twigs. In some of these the individual cord impressions are horizontal and form nearly continuous lines around the vessel (Plate XXVI, figures 1, 3, and Plate XXVII, figure 1). In others the individual impressions are horizontal, vertical, or oblique, and are disposed in horizontal and oblique rows (Plate XXV, figures 10, 11, 14, 20-22, and Plate XXVI, figures 4, 7-10). In still others part of the pattern consists of groups of oblique impressions and part of groups of vertical impressions (Plate XXV, figures 21, 22, and Plate XXVI, figures 2, 12, 13). In only one fragment do they form a zigzag pattern (Plate XXVI, figure 14).

One hundred and sixty fragments, or about thirty-eight different pots, have been decorated with cord-wound hoops or loops, producing the fan-like pattern seen on Plate XXVI, figures 15-17.

The inside surface of four rim fragments is also decorated with cord impressions (Plate XXVI, figure 18). The top edge of a few rim fragments is decorated with cord impressions made by pressing the cord-wrapped twig straight or diagonally across the top of the rim (Plate XXV, figure 21, and Plate XXVI, figure 19). On other fragments the impressions apparently were made by applying the twig lengthwise along the top of the rim (Plate XXVI, figure 20).

All pottery found here belongs to the "archaic Algonkian group."[1]

TOOLS USED BY MEN

A wedge, adzes, celts, hammerstones, knives made of teeth, a point for a drill, a scraper, and whetstones were found.

Wedges. Only the artifact illustrated on Plate XXX, figure 1, could have been a wedge. It is made of antler, and is $4\frac{5}{16}$ inches long. The sharpened edge is missing. A hole $\frac{7}{8}$ inch deep in the larger end, if not due to decay, may have had some purpose. The piece of antler illustrated in figure 2 seems to be in process of manufacture into a wedge.

Celts and Adzes Made of Stone. Most of the seven stone celts and adzes found are crude. The adze or chisel on Plate XXVIII, figure 1, is made of an irregular fragment of micaceous slate, and retains the natural waterworn surface of the pebble on one side. The front, back, and the poll of the adze, made of schistose slate (figure 2), were left in the rough

[1] *See* Willoughby, C. C.: "Pottery of the New England Indians"; Putnam Anniversary Volume (New York, 1909), pp. 84–92.

state, but the side edges are pecked. It has a good cutting edge. Both faces are encrusted with iron rust, possibly from contact with iron ore, pieces of which were found in the shell-heap. Figure 3 illustrates the poll end of a polished adze made of argillaceous slate. It is pentagonal in cross-section. Marks of pecking are visible on the front, possibly from use as a hammer after it became broken. Two other polished pieces of stone found here may also be fragments of celts or adzes.

Double-bitted Adzes or Chisels. The small, thin chisel, roughly chipped from grey stone (figure 4), has a cutting edge at each end. Possibly the cutting edge at the narrow end was made after the edge at the other end was broken. A double-bitted celt, in the Patterson collection, Dalhousie University, Halifax, was found at Backman beach, about 5 miles across the bay.

Manufacture of Stone Celts and Adzes. Forty pieces of stone in process of manufacture into celts and adzes were found. Twenty-seven are fragmentary, but the ultimate form can be recognized in all but three pieces. A large, thick piece of stone (Plate XXVIII, figure 5) shows what was probably the preliminary stage in the manufacture of a stone celt or adze. Continuation of the process of breaking and chipping shown in this specimen would have resulted in a form like that seen in figure 6, which has as yet no indication of a cutting edge. The specimen on Plate XXIX, figure 1, shows another step in advance, the blade being chipped thin in preparation for grinding a cutting edge. Figure 2 illustrates another piece similarly chipped to approximate form, and which in addition shows signs of battering or pecking. Small beach stones that approximated celts or adzes in shape and required only some chipping and grinding to produce a cutting edge were sometimes utilized (figures 3 and 4).

Celts or Chisels Made of Antler. There were no celts or chisels made of antler, unless one of the artifacts (Plate XXX, figure 1) discussed under wedges can be regarded as such.

Stone Gouges. No gouges were found, but two knobbed stone gouges in the Des Brisay collection, in the Provincial Museum, Halifax, are said to have come from Lunenburg county.

Grooved Stone Axes. No grooved stone axes were found here, but Mr. Edmund Zwicker found two on his farm near Oakland, about half a mile from the shell-heap.

Hammerstones. The writer found five specimens which were used as hammers, four being rounded beach pebbles of reddish quartzite. One of these (Plate XXX, figure 3) is battered from use on the sides and ends. Another much smaller specimen has its entire periphery more or less battered. The hammer illustrated in figure 4 is a small, irregular piece of quartz, which is considerably battered, probably from use in chipping or pecking. None of the hammers was pitted or grooved.

Knives. The leaf-shaped points considered under "Securing of Food," and illustrated on Plate XXIII, figures 1-6, may have been used as points for men's knives. The notched points for arrows and almost any sharp piece of chert or other siliceous stone, however, could be used on occasion for cutting purposes.

Knives Rubbed from Slate. No points or blades for knives rubbed from slate were found here, although the long, leaf-shaped piece of argillaceous slate illustrated on Plate XXXII, figure 13, may have been in process of manufacture into such a point. There is a well-made, shouldered, slate point, with lateral expansions at the base, in the Des Brisay collection, Provincial Museum, Halifax, which may have come from Lunenburg county, like most of the material in that collection.

Knives Made of Copper. No knives made of copper were found. Such knives were discovered at Backman beach, two from that locality being in the Provincial Museum, Halifax.

Knife Handles. The thin fragment of a bone artifact (Plate XXXII, figure 6) with a piece cut off at one end had probably been a knife handle. This is suggested by a deep V-shaped groove, along one of the narrow sides, which may have held the blade. The antler artifact described as probably a wedge (Plate XXX, figure 1) may also have been used as a knife handle after the working edge was broken, the hole in the larger end forming a convenient socket for the insertion of the blade.

Knives, etc., Made from Incisor Teeth. Six incisor teeth of the beaver, with the cutting end artificially ground to a point, were found. These were probably used as knives (Plate XXX, figures 5-7). That in figure 7 has the root cut off. The specimen shown in figure 8 is made from the incisor of a porcupine. The incisor of a woodchuck, seen in figure 9, has both sides at the cutting end slightly ground, perhaps to make a knife or some other implement.

Drills. The narrow, pointed end of the irregularly shaped artifact, chipped from quartz, on Plate XXX, figure 10, probably was used for drilling holes. The point with attenuated tip, seen on Plate XXIII, figure 4, may have been used for a similar purpose.

Scrapers Used in Woodworking, etc. Plate XXX, figure 11, illustrates a nearly quadrangular, thin flake of pinkish jasper, delicately chipped to a bevelled edge on three sides, which was probably used as a scraper for smoothing bone or wooden artifacts, just as carpenters use a piece of glass for the purpose.

Whetstones. Seven whetstones were found. Three are made of schistose slate, two of sandstone, one (Plate XXX, figure 12) of granitic rock, and another (figure 14) of light grey, argillaceous slate. One is a naturally flattened thin beach pebble, not much worn from use. Three are hollowed from long use. Most of them were used on both of the flat sides. One was chipped to a more or less rectangular form. These stones probably served for sharpening a variety of tools and some may also have been used as polishers.

The spatulate pebble on Plate XXX, figure 13, has part of one edge slightly ground, also, perhaps, from use as a whetstone.

The flattened reverse side of the large stone illustrated on Plate XXVII, figure 2, presents plainly recognizable traces of having been used as a rubbing stone, on which bone awls and the cutting edges of stone adzes and celts were probably rubbed into shape.

TOOLS USED BY WOMEN

Tools used by women consist only of stone blades for skin scrapers, a possible draw-shave skin scraper of bone, bone awls, bone needles, and a possible cord-smoother of stone.

Scrapers. Blades for scrapers were the most numerous of the artifacts chipped from stone. Forty-four were found. Three were chipped from chert, five from chalcedony, nineteen from jasper, sixteen from quartz, and one from quartzite. They are all of the plano-convex type (*See* profile on Plate XXXI, figure 9) with a scraping edge chipped to a more or less semicircular form. Some are made from chips of suitable form (figure 1) by merely chipping the widest end into a serviceable shape (figures 2-5, 9), whereas others (figures 6-8) show a little more work. A few chips (figure 5) seem to have been selected because they were more or less triangular, the attenuated end being suitable for insertion into some sort of a handle. The scrapers range in size from one (figure 8) $\frac{1}{2}$ inch long and $\frac{5}{8}$ inch wide to the large one seen in figure 6, which is $1\frac{3}{4}$ inches long, and the same width. The thickness varies from less than $\frac{1}{8}$ to $\frac{11}{16}$ inch. The scraping edge of only one specimen (figure 6) shows any signs of wear.

Draw-shave Scraper or Beaming Tool. We found part of what may have been a beaming tool used in tanning. It is the proximal end of a metacarpus of a moose (Cat. No. VIII-B-338), with the thickness of the articular end reduced by cutting or rubbing. The rest of the remaining part of one side of the shaft is slightly polished and, as is suggested by longitudinal striæ, has been scraped with a knife or scraper.

Awls. Sixteen awls made of bone were found, of which thirteen are fragmentary. One (Plate XXXI, figure 12) is merely a sharpened splinter of bird bone. Four specimens, two of which are illustrated in figures 14 and 18, are made from the splint bones of the moose. The specimen seen in figure 13 is made from the leg bone of some small mammal, the broken articular end forming a good handle. Another specimen appears to have been made from a bone of a small cetacean or shark. The fragmentary awl illustrated in figure 11 is extremely slender, being only about one-eighth of an inch in diameter. The smoothly finished awls were originally well shaped, especially that illustrated in figure 17. Only one ornamented awl was found (figure 18). The middle third part was rubbed until rectangular in cross-section, with the side shown in the illustration slightly convex. The size of the articular end was reduced by rubbing. The greater part of this awl was originally polished.

A double-pointed bone artifact (Plate XXIII, figure 13), and another (figure 15), described under "Securing of Food," were possibly also used as awls.

Copper Awls. No awls made of copper were found here, although a specimen, now in the Provincial Museum, Halifax, was collected at Backman beach. Another was found by Mr. C. H. Mills near Chester Basin, about 9 miles to the northeast.

Bone Needles. Fragmentary artifacts (Plate XXXI, figures 19, 20), each with the remains of a hole at one of the fractured ends, may have been netting needles like those found at Iroquoian sites in New York and Ontario.

Cord Smoother. Three small notches seen in a thin piece of schistose slate (Plate XXXI, figure 10) may have been used for smoothing cords or sinew.

PROCESSES OF MANUFACTURE

Evidences were seen of the following processes of manufacture: breaking, cutting, cutting and breaking, chipping, flaking, pecking, rubbing, drilling, perforating, punching, modelling, impressing, and twisting.

Breaking. This is the primary process in the manufacture of most stone and bone implements, and is illustrated by the broken pebbles of quartz and other stones (Plate XXIV, figures 1-3, Plate XXVIII, figure 5, and Plate XXXII, figure 13), and splinters of bone (Plate XXXII, figures 8, 9), which required only to be rubbed into shape to make awls or points for arrows. Plate XXXII, figures 10, 11, illustrates two incisor teeth of the beaver, broken in half lengthwise, probably for the manufacture of knives.

Cutting. There is evidence of cutting on the large piece of worked antler illustrated on Plate XXX, figure 2, in the tip cut from some pointed bone implement seen on Plate XXXII, figure 5, and in the small cut piece of antler on Plate XXXII, figure 7.

Cutting and Breaking. Although the breaking of animal bones to get the marrow sometimes resulted in short, narrow splinters suitable for making awls and other implements, bone is not easily spilt into long, narrow pieces. To secure such pieces it was necessary to cut and then break the bone (Plate XXXII, figures 1-4). Eight pieces showing this method of cutting were found. The cutting, judging from the wide groove seen in the piece of the metatarsus of a moose illustrated on Plate XXXII, figure 1, seems to have been done with a broad convex-edged plough grinder of gritty stone which was pushed back and forth until the cutting had become deep enough to permit the thin remaining septum to be broken without danger of breaking the bone crosswise. On one edge of the piece seen in figure 3 cutting was kept up until it went through the wall of bone. The piece of bone shown in figure 4 shows that sometimes more than one cut had to be made to secure pieces suitable for making the desired implement.

The small piece of bone on Plate XXXII, figure 6, shows transverse cutting and breaking at one end. The upper end of the piece of antler on Plate XXX, figure 2, and both ends of the small piece shown on Plate XXXII, figure 7, show that they had been separated from another piece by transverse cutting and breaking.

Chipping. The series of points for arrows and knives on Plate XXIII, figures 1-12; the roughed-out forms on Plate XXIV, figures 6-12; the celts or adzes on Plate XXVIII, figures 1, 2, 4; the unfinished celts or adzes in figures 5 and 6 on the same plate and on Plate XXIX, figures 1-4; the chipped point for a drill shown on Plate XXX, figure 10; the blades

for scrapers on Plate XXX, figure 11, and Plate XXXI, figures 2-9; and what may be an unfinished gorget on Plate XXXII, figure 18, were all chipped to their present form.

Altogether four hundred and seven pieces of quartz showing evidence of working were found here. These comprise one hundred and twenty-six large fragments of pebbles retaining part of the original waterworn surface; one hundred and sixty-three smaller fragments, also retaining part of the waterworn surface, sixteen showing secondary chipping or flaking; four large angular pieces from which chips had been struck; and one hundred and fourteen small chips, thirty-three of which show secondary chipping. Only about 12 per cent of the total number show secondary chipping or flaking, and notwithstanding the other numerous evidences of manufacture, only thirty-four completed artifacts made of quartz were found. This paucity of finished implements suggests that specialization of most of them was probably completed at some other place, perhaps in the interior. One might consider this as a further indication of the merely seasonal occupation of this site.

Evidences of the working of some of the other materials mentioned were not so numerous. We found only eleven chips of pinkish, yellowish, and red jasper, and twenty-two artifacts chipped from this material, two of the chips showing slight secondary chipping or flaking. Of chert we found eighteen chips and ten artifacts, two of the chips retaining part of the waterworn surface and two others showing secondary chipping. There are eleven fragments of quartzite and six artifacts; four pieces being small angular chips, and the other seven large and small fragments retaining part of the natural surface of the pebble. We found ten chips of bluish, reddish, and light lavender-coloured chalcedony, and six artifacts. One of the chips retains part of the waterworn surface.

The rough, preliminary chipping may have been done on large flattened stones such as that seen on Plate XXVII, figure 2.

Flaking. The edges of some of the chips of quartz, jasper, and chert, and of the points for arrows, scraper blades, and the drill points are all flaked. Two pieces of bone, one of which is illustrated on Plate XXXII, figure 12, also show flaking.

Pecking. This process is illustrated by several specimens, especially those seen on Plate XXVIII, figure 2, and Plate XXIX, figure 2. The lighter-coloured parts of the unfinished artifact seen on Plate XXXII, figure 14, show where the stone has been pecked or brusied by hammering with another stone.

Rubbing. This was the finishing process in the manufacture of such stone artifacts as celts, adzes, and gorgets, what is probably an unfinished specimen of the latter being illustrated on Plate XXXII, figure 19. The bone awls and other artifacts made of this material were all more or less rubbed into shape.

Drilling. Although two artifacts were found which may have been points for drills (Plate XXIII, figure 4, and Plate XXX, figure 10), only

two holes appear to have been drilled. One of these is seen in a fragment of a point for a harpoon (Plate XXIII, figure 18); the other is drilled through a fragment of pottery.

Perforating. Perforations which seem to have been gouged out rather than drilled are seen in a fragmentary point for a harpoon (Plate XXIII, figure 17); in a fragment of pottery (Plate XXV, figure 8); in two fragments of what may have been bone needles (Plate XXXI, figures 19, 20); and in two pendants made from canine teeth, one of which is illustrated on Plate XXXII, figure 15.

Punching. Punching with a stylus may be seen on a number of fragments of pottery, especially those shown on Plate XXV, figures 11-14, 21, Plate XXVI, figures 7, 15, and Plate XXVII, figure 1.

Modelling. Evidence of this process is furnished by the fragments of pottery, some of which probably belonged to pots which had been modelled from a mass of clay.

Impressing. Impressing is seen in the decoration of pottery.

Twisting. The cord impressions on pottery show that cords were made by twisting—no doubt vegetal fibres.

DRESS AND ORNAMENT

Only two artifacts found here may be considered for ornament. They are pendants made by perforating the root end of canine teeth of the bear and wolf. The bear tooth (Plate XXXII, figure 15) had the root ground down to a wedge shape before it was perforated. The hole seems to have been gouged out rather than drilled. A part of the tooth with the dentine is missing. Only a small part of the hole remains on the other pendant. One side of the root has been flattened by rubbing. Although there was an abundance of shell, no ornaments seem to have been made of this material.

GAMES, AMUSEMENTS, AND SMOKING

Gaming Disk. A small, round stone, about an inch in diameter, with flattened sides slightly polished (Plate XXXII, figure 16), may have been used as a disk in playing a game.

Stone Gorgets. No perforated gorgets made of stone were found. Two objects (Plate XXXII, figures 18, 19), however, may be unfinished gorgets. The upper one is chipped from veined grey slate. The lower one is chipped from schistose slate and nearly all the facets left by the chipping were effaced by rubbing.

Pipes. No pipes for smoking were discovered here, although one was found by Mr. Edmund Zwicker on his farm about half a mile west of the shell-heap. This may be modern, judging from his description.

DECORATIVE ART

Of all the artifacts found here only pottery, a bone awl, a piece of bone, and what may have been a bone needle, were decorated. The decoration of the pottery has been discussed on pages 119 and 120.

The bone awl illustrated on Plate XXXI, figure 18, has a V-shaped incision at each end on both sides of the flattened part of the awl. The angles of the part bounded by these V-shaped incisions are ornamented with shallow notches. The deeper notches seen on the irregular fragment of bone illustrated on Plate XXXII, figure 17, may have been enumerative tallies rather than for ornament.

A sort of herring-bone ornamentation is seen on a fragment of what may have been a needle (Plate XXXI, figure 20).

GRAVES

No graves were found during the excavations, nor did the writer hear of any skeletons being found in the immediate vicinity of the shell-heap.

If one can rely on the information given by the finders, a skeleton accompanied by a stone celt was ploughed up some years ago a few feet from the shell-heap on the Weihnacht farm.

Some bones thought to be human and boards which may have belonged to coffins were washed out of the bank at Indian point in recent years, but these must have belonged to quite recent Micmacs, who are known tc have made the point their headquarters and had a graveyard there.[1]

CONCLUSION

The Eisenhauer heap was composed almost entirely of shells of the soft-shelled clam, but it also contained ten other varieties of marine shells and one species of land snail. Compared with the remains of shell-fish, there were few bones of other food animals, which suggests that hunting and fishing were merely incidental activities during the seasonal occupation of the site. The natural resources, such as stone, bark, wood, and bone, were used, and two natural copper nuggets were found. Implements used in securing food were confined to stone and bone points for arrows and bone points for harpoons, the latter suggesting Eskimo influence. The earthenware pots were crude and had rounded bottoms. Artifacts made of bone were less numerous than those of stone, but most of them were of better finish. Antler was used for "wedges" and little else. Knives made of the incisor teeth of the beaver and some of the bone awls and scrapers chipped from stone resemble those found in Ontario. The absence of stone gouges and grooved stone axes, which, however, occur as surface finds nearby and elsewhere in the province, suggests that these artifacts belong to some other and possibly earlier people than the Micmacs. The partly

[1] Des Brisay, Mather B.: "History of Lunenburg County" (Second edition, Toronto, 1895), pp. 152, 346.

completed implements and the abundant chippings show that many of the stone artifacts were made on the spot. Two perforated canine teeth of the bear and wolf are the only articles of adornment. No pipes were found. Art is confined to the decoration of pottery and three bone objects, consisting of circular and oval stylus indentations and impressions produced with cord-wound twigs, arranged in various patterns, on the former, and incised lines and notches on the latter. No burials were discovered.

This heap was small, shallow, and unstratified, and so probably only of one period; perhaps a temporary camp site occupied only during the warmer seasons of the year. It is prehistoric and probably Micmac.

Judging from the small number and variety of the finds, the culture was poor and crude—typical of littoral habitation sites along the north Atlantic coast generally.

PLATE I

A. Archæological site. Indian reservation on Indian island and shell-heap D. Shell-heap D extends from the bushes along the beach to near the landing on Mr. Donald McDonald's farm, Olding island. It is sheltered by the hill. View from the east, at high tide, showing the extent of the shell-heap after its exploration had been completed. (Page 8.)

B. Method of excavating shell-heap D. View from the west, after two men had been trowelling a day and a half. Another shell-heap, E, near Mr. McDonald's barn, extends from the trees on the left way to the left side of the picture. Two other shell-heaps, F and G, are on the point to the right of the Olding barn in the middle distance. (Page 8.)

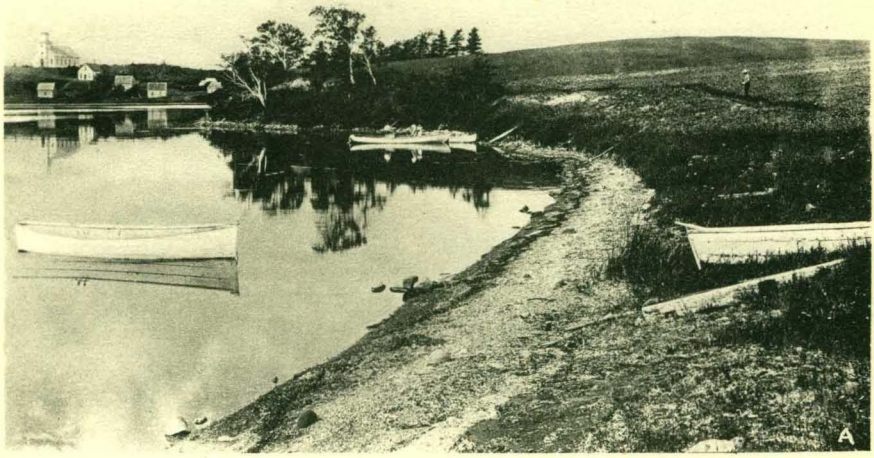
A


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PLATE II

Methods of excavating shell-heaps, A, Quarry island, and D, Olding island.

A. View from the south of shell-heap A on Quarry island, Nova Scotia, showing men trowelling in from the quarry pit, in a section of about 2 feet of shell material overlain by quarry refuse. Scattered shell-heap material extended as far as the trees. (Page 7.)

B. Section about 17 inches high in shell-heap D, near the landing on Mr. Donald McDonald's farm, Olding island, Nova Scotia, showing shells and black earth. (Page 8.)

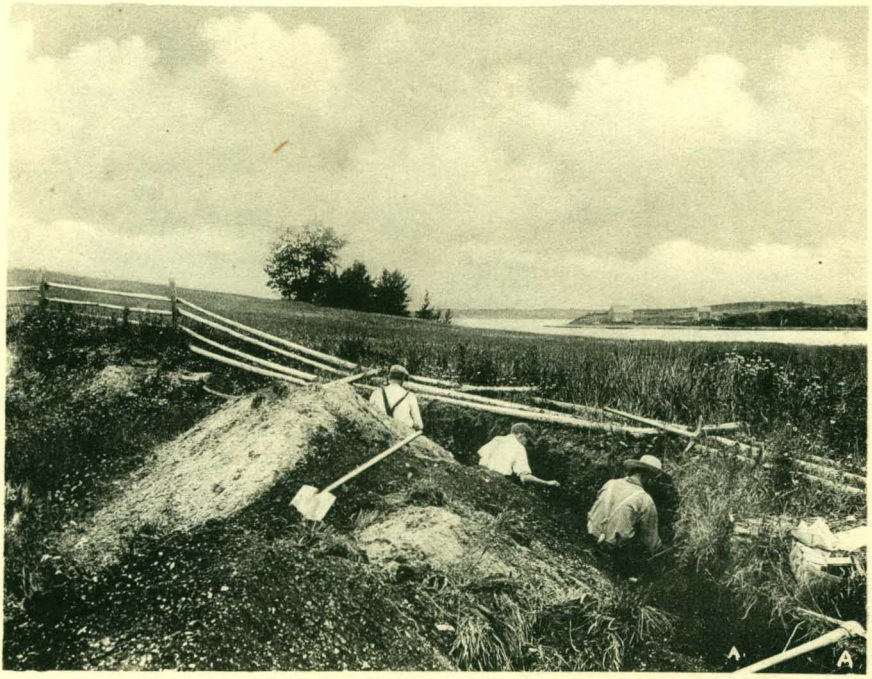
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PLATE III[1]

Chipped stones and points for arrows and knives

FIGURE 1. Quartzite pebble from which chips have been struck. Shell-heap A. Cat. No. VIII-B-1198. (Page 23.)

FIGURE 2. Chip from a quartzite pebble. Shell-heap A. Cat. No. VIII-B-1199a. (Page 23.)

FIGURE 3. Chip from a quartz pebble. Shell-heap A. Cat. No. VIII-B-1199b. (Page 23.)

FIGURE 4. Chipped piece of quartz. Shell-heap A. Cat. No. VIII-B-1201a. (Page 23.)

FIGURE 5. Chip of metargillite. Shell-heap D. Cat. No. VIII-B-482a. (Page 22.)

FIGURE 6. Chip or flake of metargillite. Shell-heap M. Cat. No. VIII-B-795a. (Page 22.)

FIGURE 7. Metargillite from which chips have been struck all around—probably a reject. Shell-heap A. Cat. No. VIII-B-1207a. (Page 22.)

FIGURE 8. Metargillite from which chips have been struck—reject or crude point for arrow or knife. Shell-heap A. Cat. No. VIII-B-1216a. (Page 22.)

FIGURE 9. Leaf-shaped object chipped from metargillite—reject or point for arrow or knife. Shell-heap A. Cat. No. VIII-B-1003a. (Page 22.)

FIGURE 10. Leaf-shaped object chipped from metargillite—reject or point for arrow or knife. Shell-heap A. Cat. No. VIII-B-1003b. (Page 22.)

FIGURE 11. Leaf-shaped object chipped from quartzite—reject or point for arrow or knife. Shell-heap A. Cat. No. VIII-B-1217. (Page 22.)

FIGURE 12. Leaf-shaped object chipped from metargillite—reject or point for arrow or knife. Shell-heap D. Cat. No. VIII-B-592a. (Page 22.)

FIGURE 13. Leaf-shaped object chipped from chalcedony—reject or point for arrow or knife. Shell-heap D. Cat. No. VIII-B-590a. (Page 22.)

FIGURE 14. Lozenge-shaped object chipped from quartzite—reject or point for arrow or knife. Shell-heap M. Cat. No. VIII-B-803. (Page 23.)

FIGURE 15. Leaf-shaped object chipped from metargillite—reject or point for a knife with large nick. Shell-heap A. Cat. No. VIII-B-1218a. (Page 21.)

[1]All figures are approximately ½ natural size.

Plate III

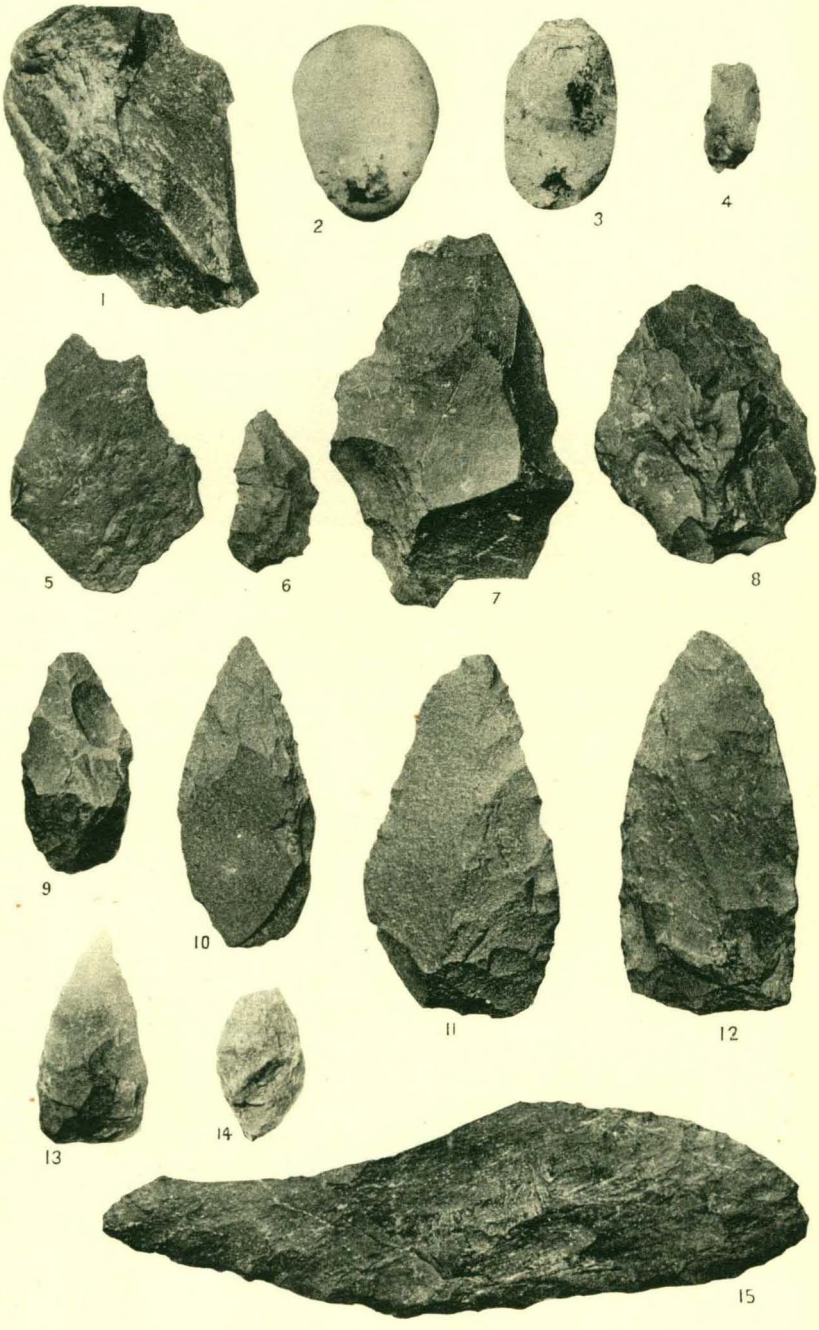

PLATE IV

Points for arrows and knives

FIGURE 1. Leaf-shaped point chipped out of metargillite, for a knife. Shell-heap A. Cat. No. VIII-B1003c. (Page 21.)

FIGURE 2. Leaf-shaped point chipped out of metargillite, for a knife. Shell-heap D. Cat. No. VIII-B-593. (Page 21.)

FIGURE 3. Triangular point chipped out of metargillite, for an arrow or knife. Shell-heap A. Cat. No. VIII-B-927a. (Page 21.)

FIGURE 4. Triangular point chipped out of metargillite, for an arrow or knife. Shell-heap A. Cat. No. VIII-B-927b. (Page 21.)

FIGURE 5. Triangular point chipped out of metargillite, for an arrow or knife. Shell-heap A. Cat. No. VIII-B-927c. (Page 21.)

FIGURE 6. Leaf-shaped point chipped out of metargilliite, for an arrow or knife. Shell-heap L. Cat. No. VIII-B-712. (Page 21.)

FIGURE 7. Tanged point chipped out of quartzite. Shell-heap D. Cat. No. VIII-B-599. (Page 21.)

FIGURE 8. Tanged point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-928a. (Page 21.)

FIGURE 9. Tanged point chipped out of metargillite. Shell-heap D. Cat. No. VIII-B-595. (Page 21.)

FIGURE 10. Tanged point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-928b. (Page 21.)

FIGURE 11. Tanged point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-928c. (Page 21.)

FIGURE 12. Tanged point chipped out of quartz. Shell-heap D. Cat. No. VIII-B-602. (Page 21.)

FIGURE 13. Tanged point chipped out of quartzite. Shell-heap D. Cat. No. VIII-B-601. (Page 21.)

FIGURE 14. Barbed point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-932. (Page 21.)

FIGURE 15. Barbed point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-931. (Page 21.)

FIGURE 16. Notched point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-930a. (Page 21.)

FIGURE 17. Notched point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-930b. (Page 21.)

FIGURE 18. Notched point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-936. (Page 21.)

FIGURE 19. Notched point chipped out of metargillite. Shell-heap A. Cat. No. VIII-B-933. (Page 21.)

FIGURE 20. Notched and barbed point chipped out of metargillite. Shell-heap M. Cat. No. VIII-B-757. (Page 21.)

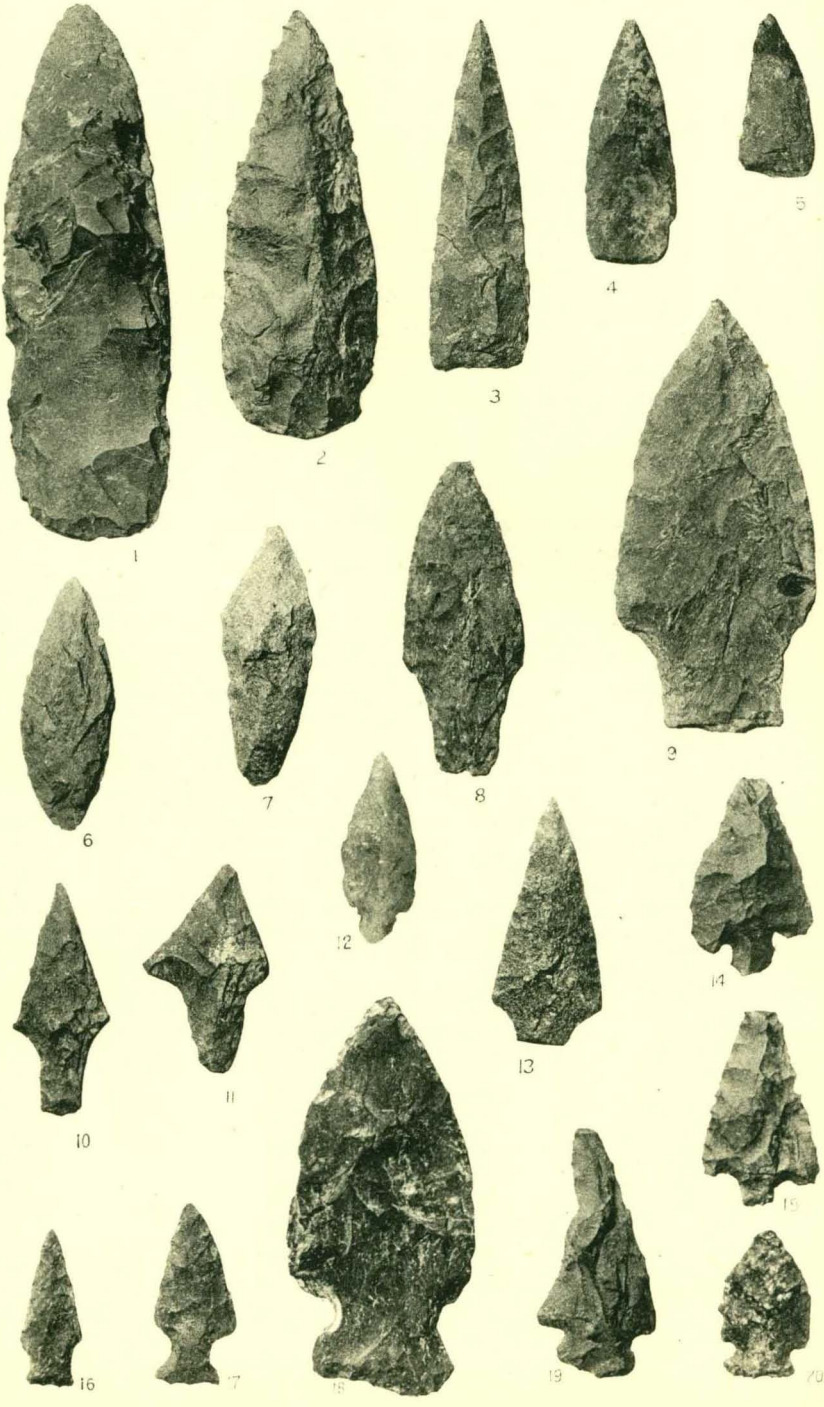
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PLATE V

Simple points made of bone

FIGURE 1. Simple small point. Shell-heap A. Cat. No. VIII-B-1091a. (Page 25.)

FIGURE 2. Simple point with enlarged tip. Shell-heap A. Cat. No. VIII-B-1091b. (Page 25.)

FIGURE 3. Simple point with enlarged tip. Shell-heap A. Cat. No. VIII-B-1091c. (Page 24.)

FIGURE 4. Simple point with oblique base. Shell-heap A. Cat. No. VIII-B-1111a. (Page 25.)

FIGURE 5. Simple point. Shell-heap A. Cat. No. VIII-B-1117a. (Page 25.)

FIGURE 6. Simple point. Shell-heap A. Cat. No. VIII-B-1117b. (Page 25.)

FIGURE 7. Simple point, showing signs of lashings. Shell-heap A. Cat. No. VIII-B-1117c. (Page 25.)

FIGURE 8. Simple point. Shell-heap A. Cat. No. VIII-B-1111b. (Page 25.)

FIGURE 9. Simple point. Shell-heap A. Cat. No. VIII-B-1116a. (Page 25.)

FIGURE 10. Simple point. Shell-heap A. Cat. No. VIII-B-1115. (Page 25.)

FIGURE 11. Simple flat point. Shell-heap A. Cat. No. VIII-B-1119. (Page 25.)

FIGURE 12. Simple point. Shell-heap A. Cat. No. VIII-B-1112a. (Page 25.)

FIGURE 13. Simple large point. Probably from shell-heap B. Bought of Joseph Philip, an Indian living on Indian island. Cat. No. VIII-B-451. (Page 25.)

FIGURE 14. Point with slightly enlarged head of oval section throughout. Shell-heap A. Cat. No. VIII-B-1113a. (Page 25.)

FIGURE 15. Point with enlarged, asymmetrical head of lenticular section and shaft of oval section. Shell-heap A. Cat. No. VIII-B-1113b. (Page 26.)

FIGURE 16. Fragment of point with notches. Shell-heap A. Cat. No. VIII-B-1136. (Page 26.)

FIGURE 17. Fragment of point with notch. Shell-heap A. Cat. No. VIII-B-1195. (Page 26.)

FIGURE 18. Tip of lance-shaped point. Shell-heap A. Cat. No. VIII-B-1153a. (Page 26.)

FIGURE 19. Fragment of lance-shaped point. Shell-heap A. Cat. No. VIII-B-1153b. (Page 26.)

FIGURE 20. Point with tang. Shell-heap A. Cat. No. VIII-B-950. (Page 26.)

FIGURE 21. Point or barb. Shell-heap A. Cat. No. VIII-B-951. (Page 26.)

FIGURE 22. Point for an arrow or knife, made of a shark's tooth. Shell-heap A. Cat. No. VIII-B-1274. (Page 26.)

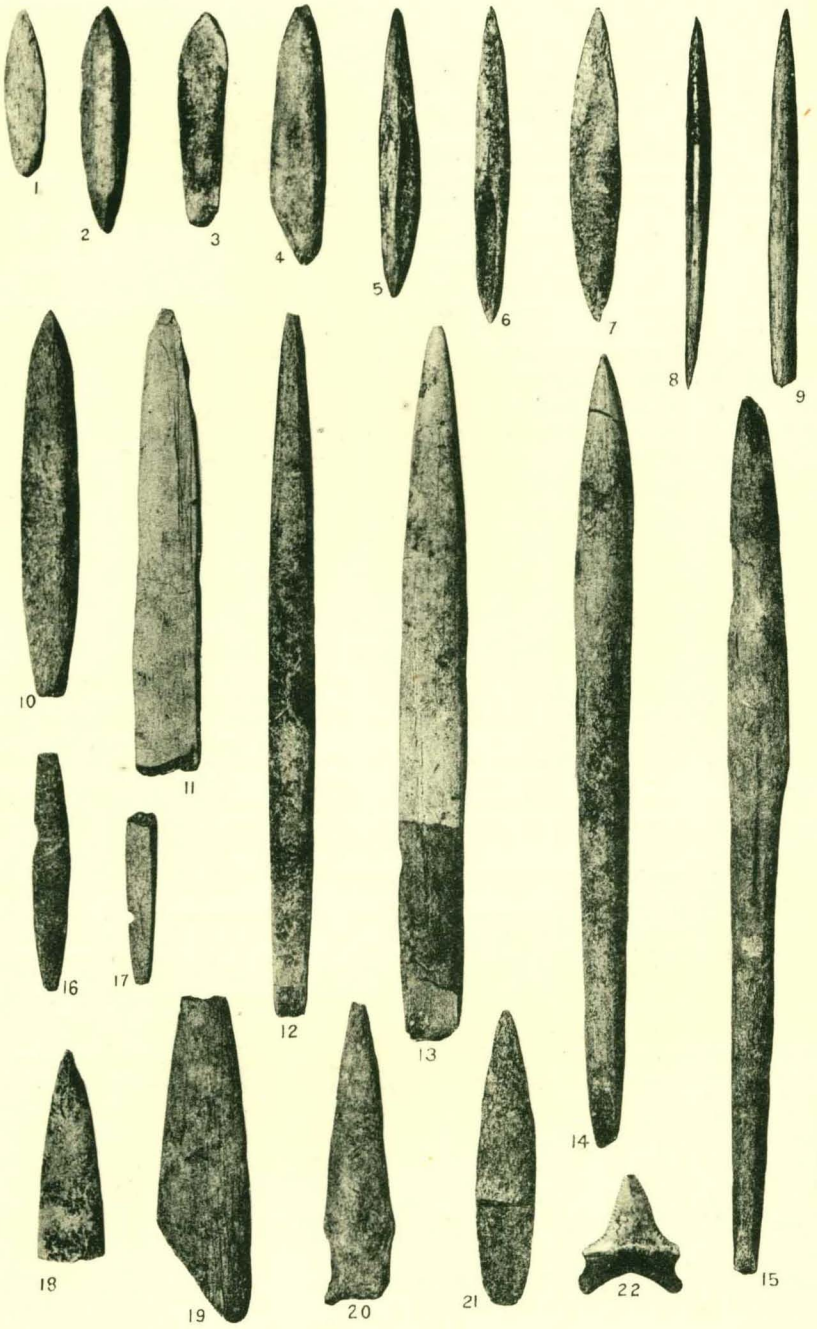
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PLATE VI

Barbed points made of bone

FIGURE 1. Fragment of harpoon point with many barbs, made by notching across the most angular edge of a bone. Shell-heap A. Cat. No. VIII-B-938a. (Page 28.)

FIGURE 2. Harpoon point with one undercut barb, made by notching both sides of the edge of a simple point of bone. Shell-heap A. Cat. No. VIII-B-944. (Page 28.)

FIGURE 3. Harpoon point with four undercut barbs, made by notching both sides of the edge in a simple point of bone. Shell-heap A. Cat. No. VIII-B-938b. (PAGE 29.)

FIGURE 4. Harpoon point with tip missing. Made by notching both sides of the edge of a strip of a long bone. Shell-heap A. Cat. No. VIII-B-1175. (Page 29.)

FIGURE 5. Fragment of harpoon point with many barbs, made by undercutting both sides and the edge of the sharp edge of a simple point of bone. Shell-heap A. Cat. No. VIII-B-938c. (Page 29.)

FIGURE 6. Harpoon point with seven barbs, made by notching both sides and the sharp edge of a simple point cut out of the wall of a bone. Shell-heap A. Cat. No. VIII-B-941. (Page 29.)

FIGURE 7. Harpoon point with six barbs, made by notching slightly on both sides and deeply notching across the sharp edge of a simple point of bone. Shell-heap L. Cat. No. VIII-B-716. (Page 29.)

FIGURE 8. Harpoon point with tip removed by incising and breaking, made by notching the sharp edge of a simple point made of bone and decorated on the obverse side with three parallel lines. Shell-heap A. Cat. No. VIII-B-939. (Page 29.)

FIGURE 9. Harpoon point made of bone with lanceolate head, having lenticular cross-section, six barbs made by cutting away most of a ridge on one edge, and with a spiral band of red stain. Shell-heap A. Cat. No. VIII-B-949a. (Page 30.)

FIGURE 10. Harpoon point with two barbs and hole gouged through tang, made of bone by deeply notching one edge. Shell-heap A. Cat. No. VIII-B-947. (Page 31.)

FIGURE 11. Harpoon point with two barbs and hole gouged through tang, made of bone by deeply notching one edge. Bought from Joseph Philip, an Indian living on Indian island. Probably from shell-heap B. Cat. No. VIII-B-607. (Page 31.)

FIGURE 12. Harpoon point with six barbs and hole gouged through tang, made of bone by deeply notching one edge. Shell-heap D. Cat. No. VIII-B-607. (Page 31.)

FIGURE 13. Basal fragment of harpoon point with hole gouged through tang and upturned projection in lowest barb notch. Shell-heap A. Cat. No. VIII-B-942a. (Page 32.)

FIGURE 14. Tip fragment of a large harpoon point. Shell-heap D. Cat. No. VIII-B-604a. (Page 32.)

FIGURE 15. Tip fragment of a blunt pointed harpoon point. Shell-heap A. Cat. No. VIII-B-938d. (Page 27.)

FIGURE 16. Tip fragment of a knob-pointed or unfinished harpoon point. Shell-heap A. Cat. No. VIII-B-943a. (Page 32.)

FIGURE 17. Fragment of shaft of harpoon point with square cut notch under barb, made of antler, decorated with rows of pits. Prehistoric cemetery. Cat. No. VIII-B-679a. (Page 32.)

FIGURE 18. Tip fragment of harpoon point with square cut notches under barbs and front edge of barbs trimmed back from front edge of harpoon. Shell-heap M. Cat. No. VIII-B-762a. (Page 33.)

FIGURE 19. Barb cut from a harpoon point. Shell-heap D. Cat. No. VIII-B-608. (Page 33.)

FIGURE 20. Fragment of harpoon point decorated by notches on front edge and back edges and by incised lines on back and adjacent part of sides. Prehistoric cemetery. Cat. No. VIII-B-678. (Page 33.)

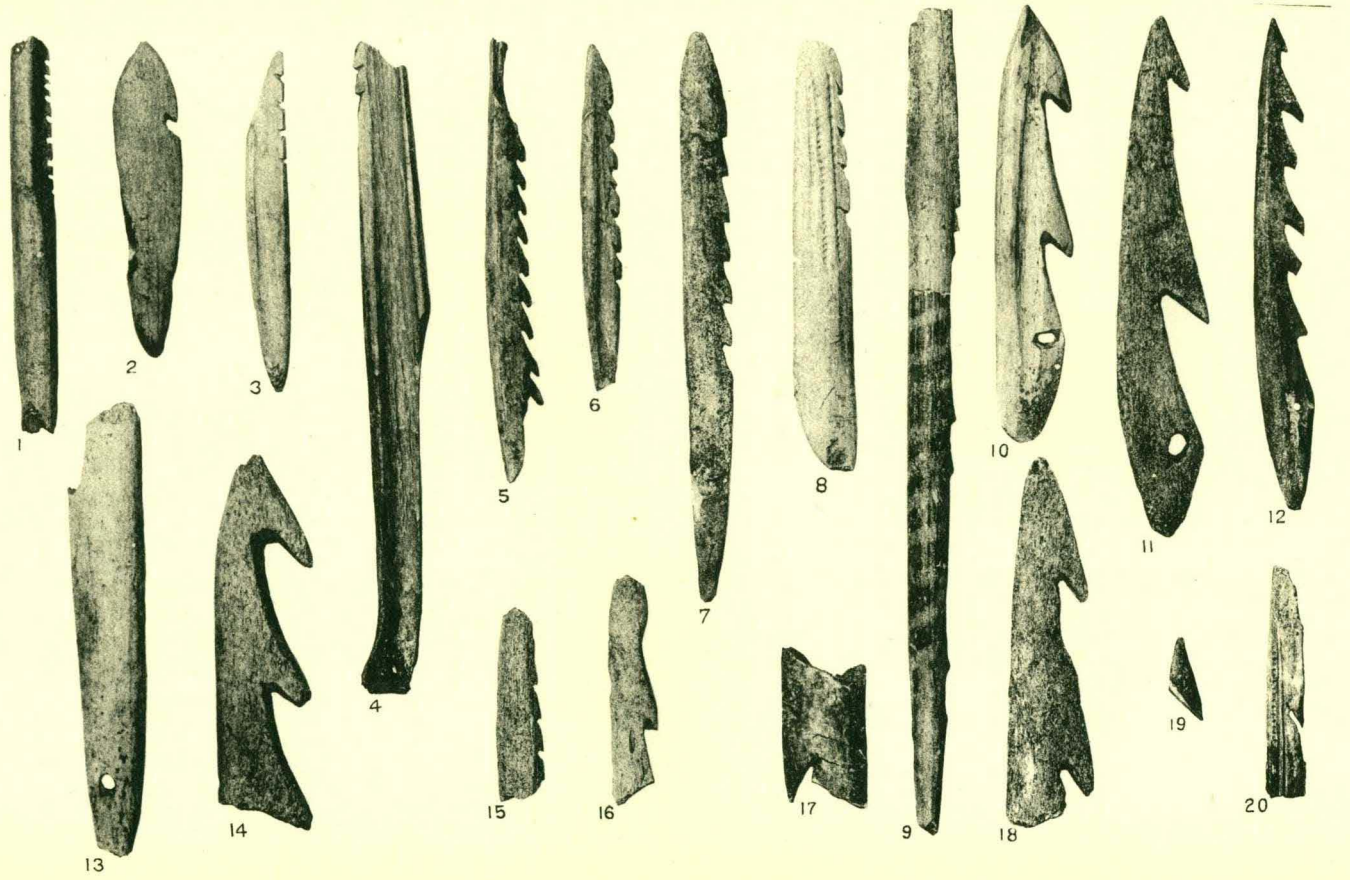
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PLATE VII

Miscellaneous objects for securing food

FIGURE 1. Fragment of a harpoon, made of bone, with lanceolate head, having lenticular cross-section and many barbs on both edges, made by notching a ridge. Prehistoric cemetery. Cat. No. VIII-B-686a. (Page 34.)

FIGURE 2. Fragment of a harpoon, made of bone, with lanceolate head, having lenticular cross-section and many barbs on both edges of the back part, made by notching away a ridge. Prehistoric cemetery. Cat. No. VIII-B-686b. (Page 34.)

FIGURE 3. Point, awl, or needle, made of copper. Shell-heap A. Cat. No. VIII-B-1146. (Page 34.)

FIGURE 4. Material, point, awl, or needle, made of copper. Shell-heap L. Cat. No. VIII-B-729. (Page 34.)

FIGURE 5. Object made of a canine tooth, with knob at one end and notch on each side of the other. Shell-heap D. Cat. No. VIII-B-638a. (Page 67.)

FIGURE 6. Object made of bone, with knob at one end and knob on one side of the other. Eastern part of shell-heap N. Cat. No. VIII-B-821. (Page 67.)

FIGURE 7. Object made of bone, with knob at one end and knob on one side of the other. Shell-heap A. Cat. No. VIII-B-1154a. (Page 67.)

FIGURE 8. Object made of bone, with knob at one end and broken at the other. Shell-heap A. Cat. No. VIII-B-1154b. (Page 67.)

FIGURE 9. Implement, possibly a bark peeler, made of bone. Shell-heap A. Cat. No. VIII-B-1077. (Page 66.)

FIGURE 10. Fragment of an implement, possibly a bark peeler, made of antler. Shell-heap M. Cat. No. VIII-B-785. (Page 66.)

FIGURE 11. Basal fragment of a large object, made of bone. Shell-heap A. Cat. No. VIII-B-1181. (Page 27.)

FIGURE 12. Fragment of bone showing parallel marks. Shell-heap D. Cat. No. VIII-B-632. (Page 63.)

FIGURE 13. Fragment of a large object, possibly a bark peeler or club, made of a whale rib. Shell-heap D. Cat. No. VIII-B-645. (Page 66.)

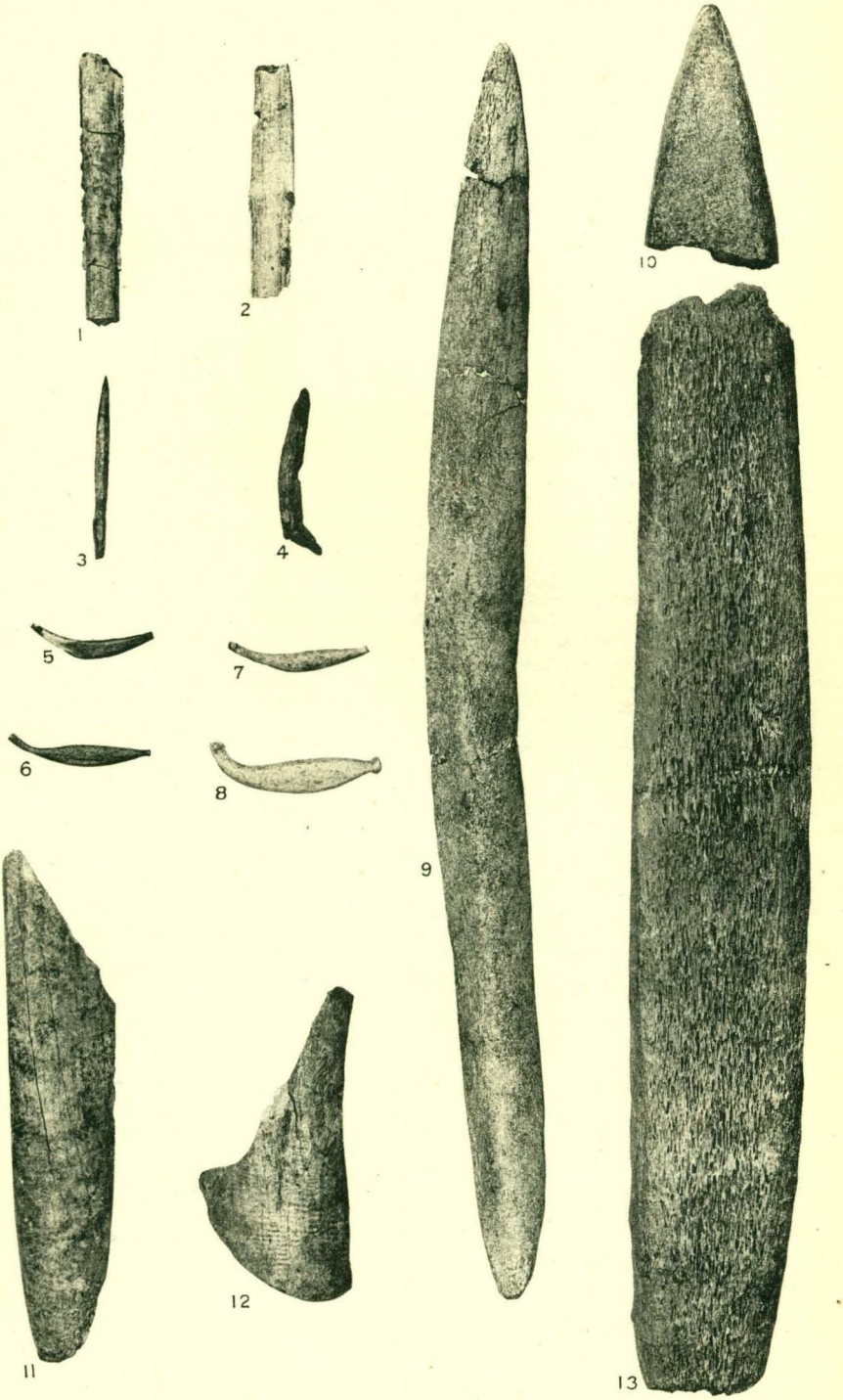
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Plate VIII

Pottery

Figure 1. Fragment of a conical base of a pot. Shell-heap A. Cat. No. VIII-B-969a. *See* Plate X, figure 10. (Page 37.)

Figure 2. Fragment of a conical base of a pot. Shell-heap A. Cat. No. VIII-B-964. (Page 37.)

Figure 3. Fragment of base of a pot or of pottery bearing part of a handle. Shell-heap A. Cat. No. VIII-B-998. (Page 37.)

Figure 4. Fragment of rim of a pot with carbonaceous matter on inner surface. Shell-heap A. Cat. No. VIII-B-959a. (Page 39.)

Figure 5. Fragment of pottery showing fragments of stone used as tempering matter and a welding line. Shell-heap A. Cat. No. VIII-B-966a. (Page 40.)

Figure 6. Fragment of pottery showing fragments of shell used as tempering matter. Shell-heap D. Cat. No. VIII-B-538a. (Page 40.)

Figure 7. Fragment of pottery showing where fragments of shell used as tempering matter have dissolved out. Shell-heap A. Cat. No. VIII-B-967a. (Page 40.)

Figure 8. Fragment of pottery of hardest and most polished ware found on Merigomish harbour. Shell-heap A. Cat. No. VIII-B-952. (Page 37.)

Figure 9. Fragment of pottery showing welding line along the upper edge and jagged lines elsewhere. Shell-heap A. Cat. No. VIII-B-975a. (Page 40.)

Figure 10. Fragment of pottery showing smooth breaks along parallel welding lines and jagged vertical breaks. Shell-heap A. Cat. No. VIII-B-961a. (Page 40.)

Figure 11. Fragments of a pot showing rim and smooth breaks along horizontal welding lines parallel with it, also jagged vertical breaks. Shell-heap D. Cat. Nos. VIII-B-545a, b, c. *See* Plate IX, figure 4. (Page 40.)

Figure 12. Fragment of pottery showing scarification made on inner surface before firing. Shell-heap D. Cat. No. VIII-B-528a. *See* Plate XI, figure 1. (Page 41.)

Figure 13. Fragment of pottery showing scarification made on outer surface before firing. Shell-heap A. Cat. No. VIII-B-973a. (Page 41.)

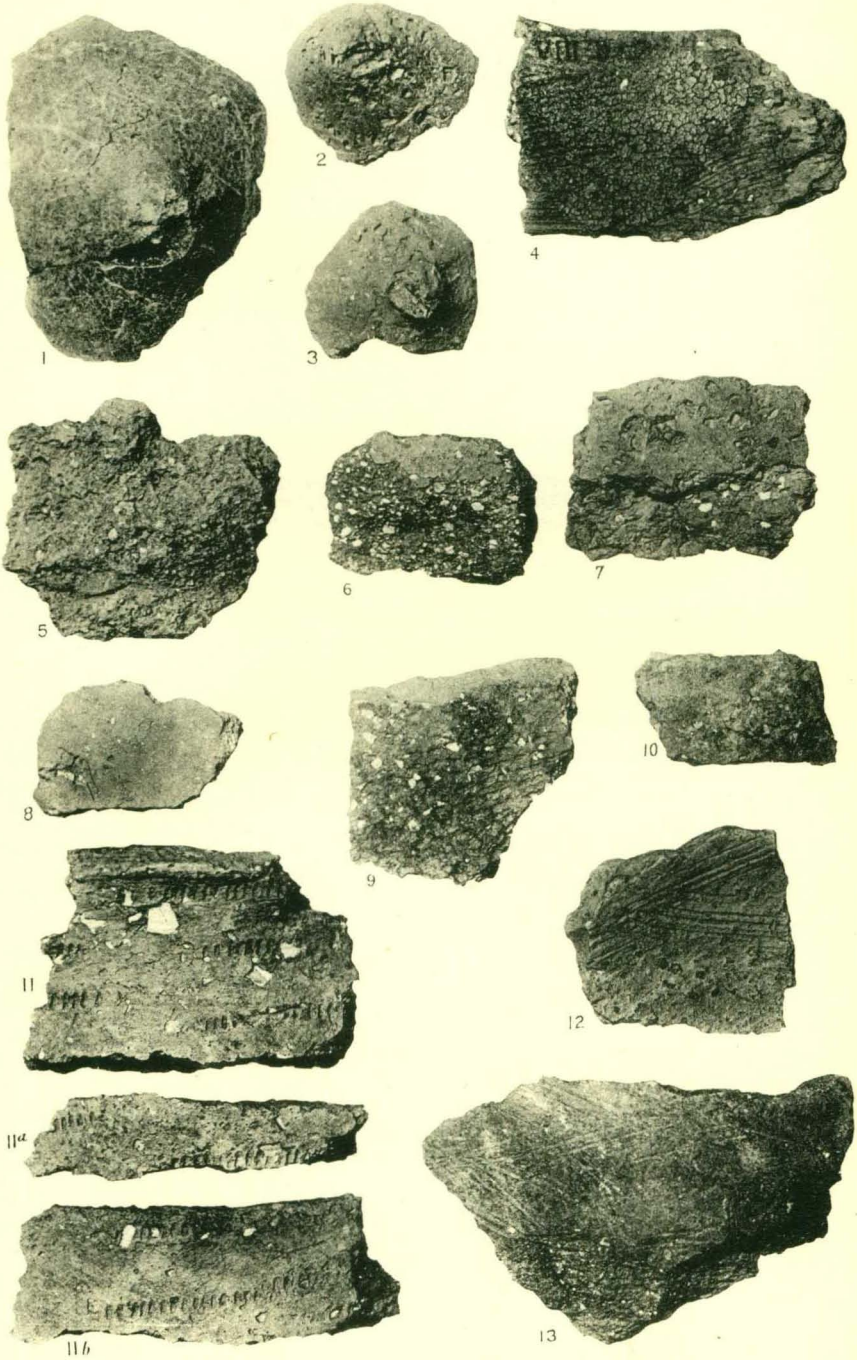
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PLATE IX

Pottery

FIGURE 1. Fragment of the rim of a pot tapering to a rounded edge. Shell-heap A. Cat. No. VIII-B-965. (Page 38.)

FIGURE 2. Fragment of the rim of a pot with square edge. Eastern part of shell-heap N. Cat. No. VIII-B-815a. (Page 38.)

FIGURE 3. Fragment of the rim of a pot with flat-topped lip. Shell-heap D. Cat. No. VIII-B-538b. (Page 38.)

FIGURE 4. Fragments of a pot decorated on only part of the surface and broken along four welding lines. Shell-heap D. Cat. Nos. VIII-B-545d, e. *See* Plate VIII, figure 11. (Page 39.)

FIGURE 5. Fragment of pottery perforated by gouging. Shell-heap D. Cat. No. VIII-B-544a. (Page 38.)

FIGURE 6. Fragment of pottery with impression of fabric. Shell-heap A. Cat. No. VIII-B-960c. *See* Plate IX, figure 7, Plate X, figure 24, Plate XI, figure 13. (Page 45.)

FIGURE 7. Plaster mould of impression of fabric on fragment of pottery illustrated in figure 6. Cat. No. VIII-B-960c1. *See* Plate X, figure 24, Plate XI, figure 13. (Page 46.)

FIGURE 8. Fragment of pottery with impressions of fingern-ails. Shell-heap K. Cat. No. VIII-B-695a. (Page 42.)

FIGURE 9. Parallel impressions on modelling clay, made with the rocker-like object illustrated on Plate XIX, figure 19. Compare those on the left, made with the object held vertical, with Plate X, figures 14, 15, 17, and *See* page 42. Compare those on the right, made with the object held obliquely, with Plate X, figures 12 and 18. (Page 42.)

FIGURE 10. Zigzag impressions on modelling clay, made with the rocker-like object illustrated on Plate XIX, figure 19. Compare those on the left, made with the object held vertical, with Plate X, figure 21, and see page 43. Compare those on the right, made with the object held obliquely, with Plate X, figures 1, 19, 23. (Page 43.)

FIGURE 11. Twig wound with twisted cord, used to make the impressions illustrated in figure 14. (Page 43.)

FIGURE 12. Twig wound with squarely cut splint, used to make the impressions illustrated in figure 15. (Page 45.)

FIGURE 13. Loop of twig wound with twisted cord, used to make the impressions illustrated in figure 16. (Page 43.)

FIGURE 14. Rows of transverse parallel impressions on modelling clay, made with the twig wound with twisted cord, illustrated in figure 11. Compare with Plate VIII, figure 11, Plate IX, figure 4, and Plate XI, figures 1-5, 7-12. (Page 43.)

FIGURE 15. Rows of nearly transverse impressions on modelling clay, made with the twig wound with squarely cut splint, illustrated in figure 12. Compare with Plate XI, figure 15. (Page 45.)

FIGURE 16. Curves of transverse impressions on modelling clay, made with loop of twig wound with twisted cord, illustrated in figure 13. Compare with Plate XI, figures 3, 5, 6.

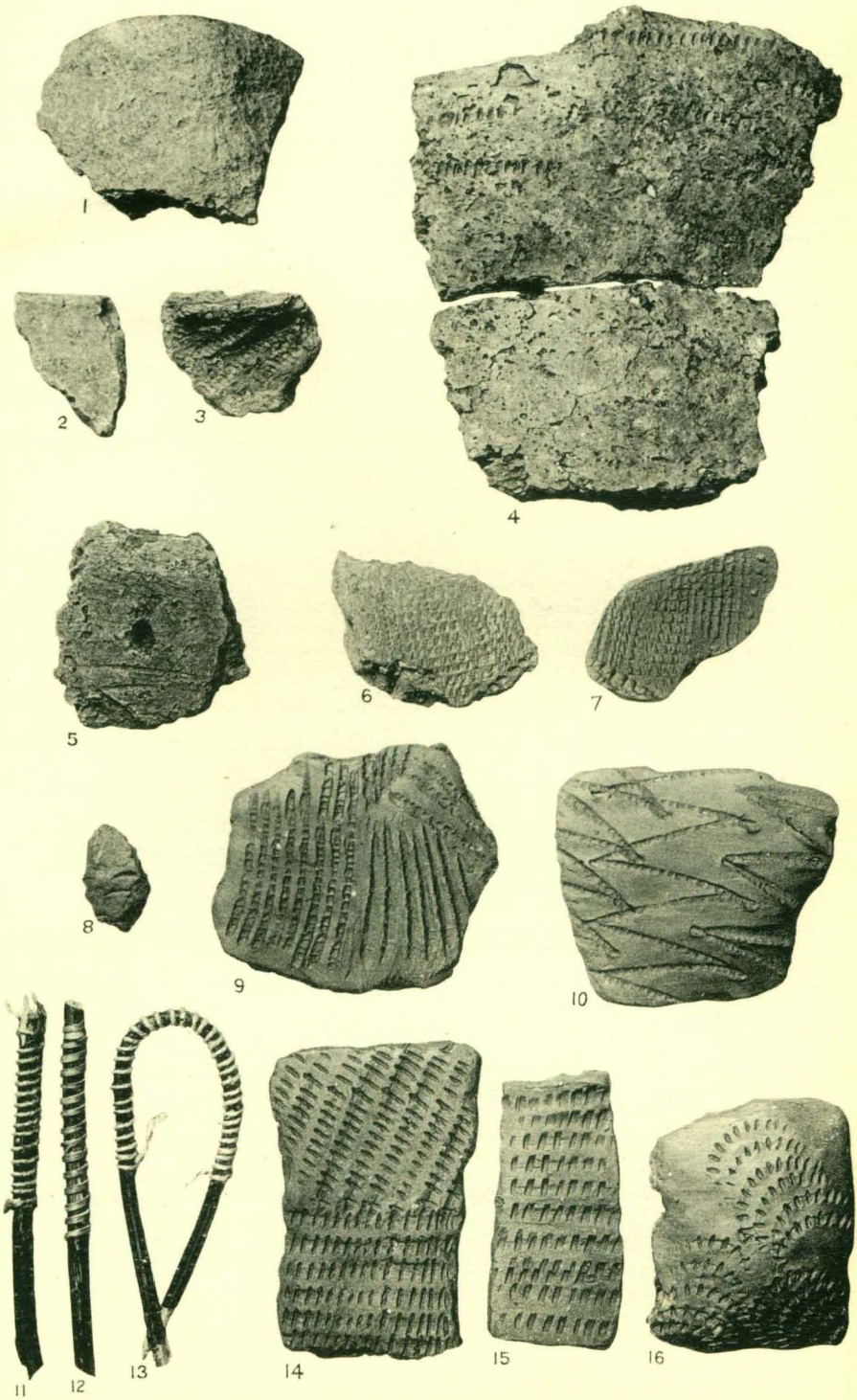
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PLATE X

Pottery

FIGURE 1. Fragment of pottery with parallel incised lines and zigzag rocking stamp marks. Shell-heap A. Cat. No. VIII-B-983a. *See* Plate X, figure 19. (Page 42.)

FIGURE 2. Fragment of rim of pot with incised lines and pits. Shell-heap O. Collected and presented by Mr. Peter A. Millar. Cat. No. VIII-B-28. (Page 42.)

FIGURE 3. Fragment of rim of pot with incised lines oblique and perpendicular to edge, pits in edge and parallel with rim, and rocker or stamp marks. Shell-heap A. Cat. No. VIII-B-959b. *See* Plate VIII, figure 4. (Page 42.)

FIGURE 4. Fragment of rim of pot with incised lines parallel to rim, stylus marks and rocking stamp marks. Shell-heap A. Cat. No. VIII-B-954a. (Page 42.)

FIGURE 5. Fragment of rim of pot with two rows of vertical gashes parallel to edge, the gashes of one opposite the spaces of the other. Shell-heap A. Cat. No. VIII-B-994a. (Page 42.)

FIGURE 6. Fragment of pottery with incised lines and pits. Shell-heap A. Cat. No. VIII-B-977a. (Page 42.)

FIGURE 7. Fragment of rim of pot with row of circular impressions on middle of the flat edge. Shell-heap A. Cat. No. VIII-B-980a. (Page 42.)

FIGURE 8. Fragment of rim of pot with incised lines nearly vertical to rim, and with pits across flat edge of rim. Shell-heap M. Cat. No. VIII-B-766a. (Page 42.)

FIGURE 9. Fragment of rim of pot with impressed line and superimposed rocking stamp marks. Shell-heap A. Cat. No. VIII-B-971a. (Page 42.)

FIGURE 10. Fragment of pottery with short, vertical, impressed lines. Shell-heap A. Cat. No. VIII-B-969b. *See* Plate VIII, figure 1. (Page 42.)

FIGURE 11. Fragment of rim of pot with transverse notches. Shell-heap A. Cat. No. VIII-B-977b. (Page 42.)

FIGURE 12. Fragment of thick rim of pot with pits on outer surface, and rocking stamp marks below, on edge of rim and inside. Shell-heap A. Cat. No. VIII-B-985a. (Page 42.)

FIGURE 13. Fragment of rim of pot with pits in rows on outside and row of pits in middle of scalloped or waved edge. Shell-heap A. Cat. No. VIII-B-979a. (Page 42.)

FIGURE 14. Fragment of rim of pot with parallel rows of rocking stamp marks on both sides and edge. Shell-heap D. Cat. No. VIII-B-531a. *See* Plate X, figure 15. (Page 42.)

FIGURE 15. Fragment of rim of pot with divergent rows of rocking stamp marks on outside, and parallel rows on inside and edge. Shell-heap D. Cat. No. VIII-B-531b. *See* Plate X, figure 14. (Page 42.)

FIGURE 16. Fragment of thick rim of pot with parallel rows of rocking stamp marks and pits. Shell heap A. Cat. No. VIII-B-987a. *See* Plate X, figures 17, 26. (Page 43.)

FIGURE 17. Fragment of pot with rows of rocking stamp marks. Shell-heap A. Cat. No. VIII-B-987b. *See* Plate X, figures 16, 26. (Page 42.)

FIGURE 18. Fragment of pot with single parallel rows of rocking stamp marks. Shell-heap A. Cat. No. VIII-B-976a. (Page 42.)

FIGURE 19. Fragment of pottery with two sets of zigzag rows of rocking stamp marks at right angles to each other. Shell-heap A. Cat. No. VIII-B-983b. *See* Plate X, figure 1. (Page 42.)

FIGURE 20. Fragment of pottery with zigzag row of rocking stamp marks. Shell-heap A. Cat. No. VIII-B-982a. *See* Plate X, figure 21. (Page 42.)

FIGURE 21. Fragment of pottery with overlapping zigzag rows of rocking stamp marks. Shell-heap A. Cat. No. VIII-B-982b. *See* Plate X, figure 20. (Page 42.)

FIGURE 22. Fragment of rim of pot with part of zigzag incised line made with a sharp rocking stamp. Shell-heap A. Cat. No. VIII-B-955a. (Page 42.)

FIGURE 23. Fragment of pottery with zigzag row made with a tilted rocking stamp. Shell-heap A. Cat. No. VIII-B-971b. (Page 42.)

FIGURE 24. Fragment of pottery with impression of fabric. Shell-heap A. Cat. No. VIII-B-960a. *See* Plate IX, figures 6, 7, Plate XI, figure 13. (Page 45.)

FIGURE 25. Fragment of pottery with parallel rows and diagonal row of rocking stamp marks. Shell-heap A. Cat. No. VIII-B-989a. (Page 42.)

FIGURE 26. Fragment of rim of pot with rocking stamp marks on outside surface. Shell-heap A. Cat. No. VIII-B-987c. *See* Plate X, figures 16, 17. (Page 42.)

FIGURE 27. Fragment of pottery with a zigzag line made with a rocking stamp. Shell-heap D. Cat. No. VIII-B-540a. (Page 42.)

FIGURE 28. Fragment of pottery with rows of impressions. Shell-heap A. Cat. No. VIII-B-991a. (Page 42.)

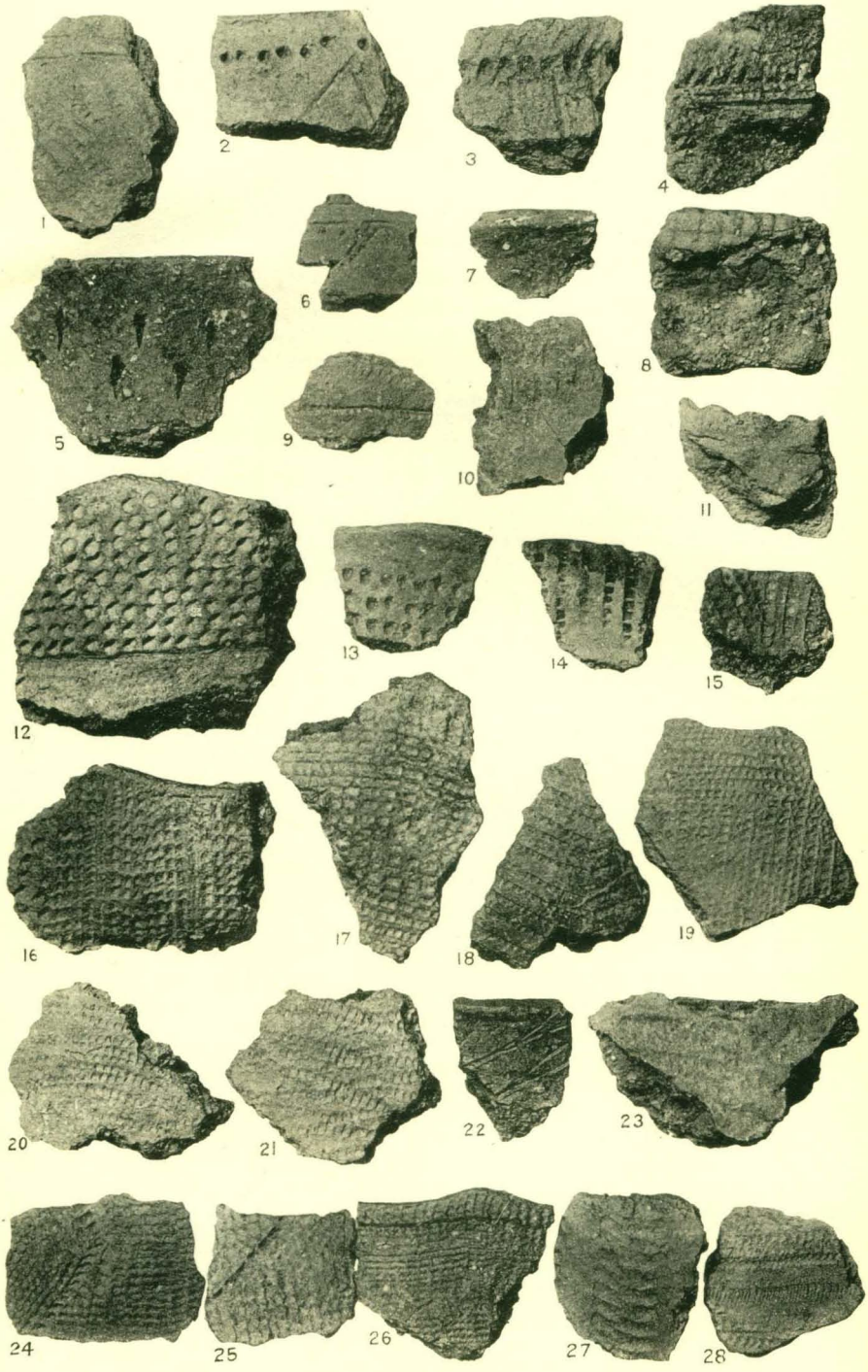
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PLATE XI

Pottery

FIGURE 1. Fragment of rim of a pot with impressions of a cord-wound rod or hoop. Shell-heap D. Cat. No. VIII-B-528b. *See* Plate VIII, figure 12. (Page 43.)

FIGURE 2. Fragment of rim of a pot with impressions across lip of a cord-wound rod or hoop. Shell-heap A. Cat. No. VIII-B-954b. (Page 44.)

FIGURE 3. Fragment of rim of a pot with impressions of a cord-wound rod, hoop, or loop. Shell-heap A. Cat. No. VIII-B-959c. (Page 44.)

FIGURE 4. Fragment of pottery with impressions of a cord-wound rod, hoop, or loop. Shell-heap M. Cat. No. VIII-B-764a. (Page 44.)

FIGURE 5. Fragment of pottery with impressions of a cord-wound rod, hoop, or loop. Shell-heap A. Cat. No. VIII-B-980c and 991b. (Page 44.)

FIGURE 6. Fragment of pottery with impressions of a cord-wound rod, hoop, or loop. Shell-heap A. Cat. No. VIII-B-991c. (Page 44.)

FIGURE 7. Fragments of pottery with impressions of a cord-wound rod, or hoop, twisted cord, and rows of punch marks. Shell-heap A. Cat. No. VIII-B-988a. (Page 45.)

FIGURE 8. Fragment of pottery with impressions of a cord-wound rod or hoop and punch marks. Shell-heap A. Cat. No. VIII-B-980b. (Page 44.)

FIGURE 9. Fragment of pottery with impressions of a cord-wound rod or hoop. Shell-heap A. Cat. No. VIII-B-975b. (Page 45.)

FIGURE 10. Fragment of the rim of a pot with impressions of a cord-wound rod or hoop on edge and outside. Shell-heap A. Cat. No. VIII-B-990a. (Page 45.)

FIGURE 11. Fragment of rim of a pot with horizontal impressions of a cord-wound rod or hoop. Shell-heap A. Cat. No. VIII-B-995. (Page 45.)

FIGURE 12. Fragment of pottery with impressions of a cord-wound rod or hoop. Shell-heap D. Cat. No. VIII-B-540b. (Page 45.)

FIGURE 13. Fragment of pottery with impressions of fabric. Shell-heap A. Cat. No. VIII-B-960b. *See* Plate IX, figures 6, 7, Plate X, figure 24. (Page 45.)

FIGURE 14. Fragment of pottery with impression possibly of a thong-wound rod or hoop. Shell-heap A. Cat. No. VIII-B-975c. *See* Plate XI, figure 9. (Page 45.)

FIGURE 15. Fragment of the rim of a pot with impressions possibly of a thong-wound rod or hoop. Shell-heap A. Cat. No. VIII-B-972a. (Page 45.)

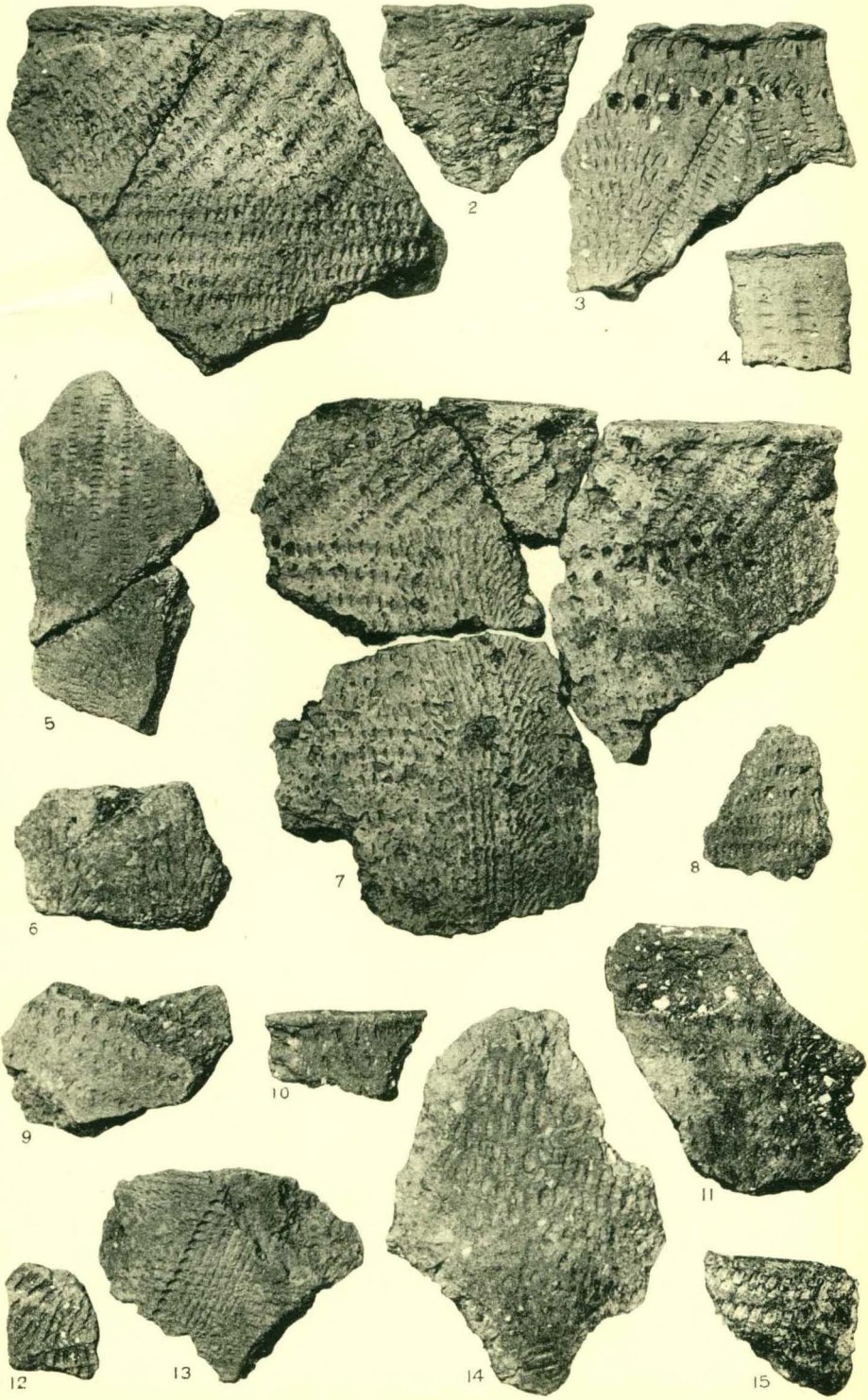
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PLATE XII

Celts made of stone

FIGURE 1. Small celt, well made. Shell-heap A. Cat. No. VIII-B-1016. (Page 47.)

FIGURE 2. Small celt, crudely shaped. Shell-heap D. Cat. No. VIII-B-566. (Page 49.)

FIGURE 3. Small celt, crudely made of a chip of stone. Shell-heap A. Cat. No. VIII-B-1004. (Page 47.)

FIGURE 4. Large celt. Shell-heap A. Cat. No. VIII-B-1014. (Page 47.)

FIGURE 5. Celt with both head and cutting edge smoothly battered. Shell-heap D. Cat. No. VIII-B-560. (Page 48.)

FIGURE 6. Sharp, symmetrical celt made of a pebble. Shell-heap L. Cat. No. VIII-B-725a. (Page 49.)

FIGURE 7. Celt with battered and fractured head. Shell-heap A. Cat. No. VIII-B-1035. (Page 48.)

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PLATE XIII

Celts made of stone

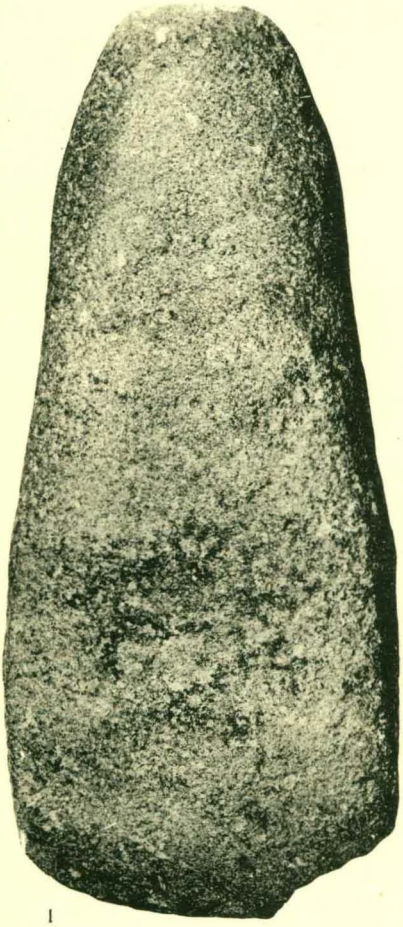
FIGURE 1. Celt with side edges shaped for hafting. Shell-heap D. Cat. No. VIII-B-564. (Page 48.)

FIGURE 2. Celt pecked on the side edges and head. Shell-heap D. Cat. No. VIII-B-558. (Page 48.)

FIGURE 3. Celt with notched side edges and slight groove. Shell-heap D. Cat. No. VIII-B-561. (Page 49.)

FIGURE 4. Thin, double-bitted celt made of dark grey schistose slate. Shell-heap A. Cat. No. VIII-B-1019. (Page 48.)

FIGURE 5. Double-bitted celt. Shell-heap M. Cat. No. VIII-B-774. (Page 48.)



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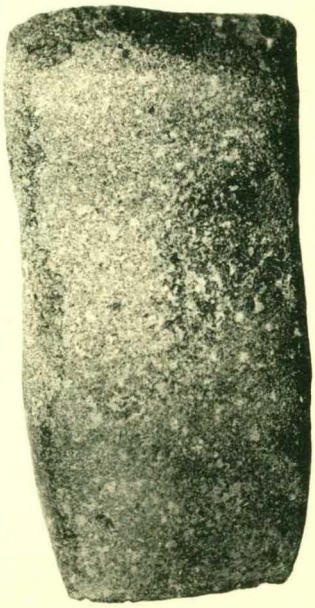

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PLATE XIV

Hammerstones

FIGURE 1. Hammer pebble of yellow quartzite, battered on each end and one side. Shell-heap A. Cat. No. VIII-B-1057. (Page 52.)

FIGURE 2. Hammer pebble of granite, battered in facets around both sides of the edge. Shell-heap A. Cat. No. VIII-B-1060. (Page 52.)

FIGURE 3. Hammerstone of granite, battered on two facets, forming an obtuse edge, and on top and edges. Surface of shell-heap E. Cat. No. VIII-B-468. (Page 52.)

FIGURE 4. Hammer pebble of purple jaspery quartzite battered over about half its surface. Shell-heap M. Cat. No. VIII-B-779. (Page 52.)

FIGURE 5. Hammerstone of purple jaspery quartzite battered in crude facets to a decahedral form. Shell-heap D. Cat. No. VIII-B-582. (Page 52.)

FIGURE 6. Hammerstone of granite battered in facets to a decahedral form. Shell-heap D. Cat. No. VIII-B-581. (Page 52.)

FIGURE 7. Hammer of hornblende granite. Shell-heap C. Cat. No. VIII-B-449. (Page 53.)

FIGURE 8. Hammer made of a celt of hornblende granite, with battered edge and pits like a pitted hammerstone. Shell-heap A. Cat. No. VIII-B-1028. (Page 53.)

FIGURE 9. Notched hammer of porphyrite. Shell-heap M. Cat. No. VIII-B-780. (Page 53.)


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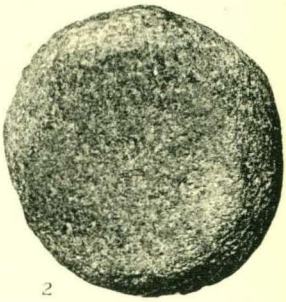
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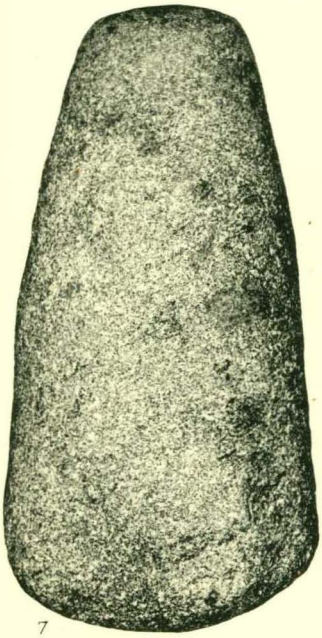
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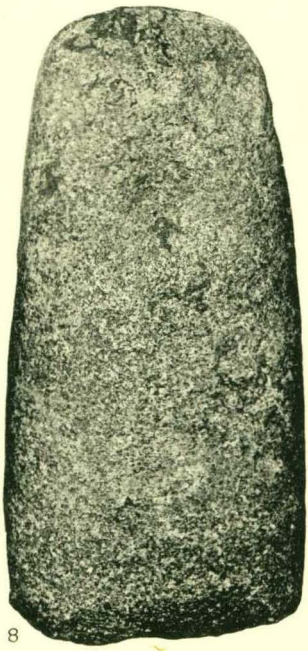
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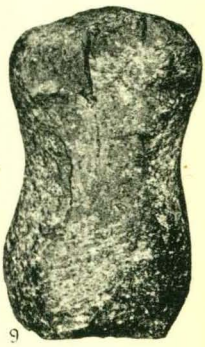
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PLATE XV

Whetstones

FIGURE 1. Grindstone made of sandstone. Shell-heap D. Cat. No. VIII-B-569. (Page 54.)

FIGURE 2. Plough grinder made of mica schist. Shell-heap A. Cat. No. VIII-B-1220. (Page 55.)

FIGURE 3. Whetstone with offsets in edge, made of argillite. Shell-heap A. Cat. No. VIII-B-1052. (Page 55.)

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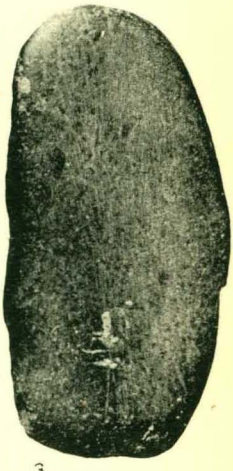

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PLATE XVI

Wedges and knives

FIGURE 1. Wedge made of a sliver of a rib of a whale. Shell-heap A. Cat. No. VIII-B-1078. (Page 56.)

FIGURE 2. Wedge made of a large, round prong of antler bevelled off on the concave side. Shell-heap A. Cat. No. VIII-B-1080. (Page 56.)

FIGURE 3. Wedge made of a small prong of antler whittled off on both sides and battered on the top. Shell-heap A. Cat. No. VIII-B-1087. (Page 57.)

FIGURE 4. Wedge made of bone sharpened off from both sides. Shell-heap A. Cat. No. VIII-B-1089. (Page 57.)

FIGURE 5. Wedge made of antler sharpened from both sides. Shell-heap A. Cat. No. VIII-B-1081. (Page 57.)

FIGURE 6. Pin-shaped object made of antler, punch-shaped at the bottom, battered on top. Shell-heap A. Cat. No. VIII-B-1072a. (Page 57.)

FIGURE 7. Object chipped from metargillite, possibly a point for a knife. Shell-heap A. Cat. No. VIII-B-1003d. (Page 57.)

FIGURE 8. Carving knife made of a lower incisor of a beaver with end cut off. Shell-heap A. Cat. No. VIII-B-1065a. (Page 58.)

FIGURE 9. Short carving knife made of the lower incisor of a beaver with end cut off. Shell-heap A. Cat. No. VIII-B-1065b. (Page 58.)

FIGURE 10. Carving knife made of the lower incisor of a beaver with inner edge and end cut off. Shell-heap A. Cat. No. VIII-B-1068. (Page 58.)

FIGURE 11. Carving knife made of the lower incisor of a beaver with inner edge cut off and end broken off. Shell-heap A. Cat. No. VIII-B-1069a. (Page 59.)

FIGURE 12. Carving knife made of the lower incisor of a beaver with inner edge cut away and end broken off. Shell-heap A. Cat. No. VIII-B-1069b. (Page 59.)

FIGURE 13. Carving knife made of the lower incisor of a beaver with both ends cut off. Shell-heap A. Cat. No. VIII-B-1065c. (Page 59.)

FIGURE 14. Carving knife made of the lower incisor of a beaver with cutting edge cut off and broken root end rounded on front and side. Shell-heap A. Cat. No. VIII-B-1064a. (Page 59.)

FIGURE 15. Carving knife made of the lower incisor of a beaver with end broken off and worn smooth and cutting edge ground off obliquely from side to side. Shell-heap A. Cat. No. VIII-B-1066a. (Page 59.)

FIGURE 16. Carving knife made of the lower incisor of a beaver with root end cut off and cutting end ground off obliquely on one side. Shell-heap D. Cat. No. VIII-B-612a. (Page 59.)

FIGURE 17. Carving knife made of the lower incisor of a beaver broken at the root end and cut off in two scallops on one side. Shell-heap D. Cat. No. VIII-B-620. (Page 59.)

FIGURE 18. Carving knife made of the lower incisor of a beaver broken off at root end and sharpened obliquely across a corner of the cutting edge. Shell-heap A. Cat. No. VIII-B-1067. (Page 59.)

FIGURE 19. Carving knife made of the lower incisor of a beaver, a longitudinal piece sharpened on the artificial edges of the upper half, cut obliquely across the rear and squarely across the end of the root end, and cut across the natural cutting edge. Shell-heap A. Cat. No. VIII-B-1062a. (Page 60.)

FIGURE 20. Carving knife made of the lower incisor of a beaver, rubbed on one side. Shell-heap D. Cat. No. VIII-B-619c. (Page 60.)

FIGURE 21. Carving knife made of a longitudinal section of a lower incisor of a beaver broken off at both ends and rubbed on the longitudinal section. Shell-heap A. Cat. No. VIII-B-1062b. (Page 60.)

FIGURE 22. Carving knife made of the upper incisor of a beaver broken off at root end with cutting edge gouged out and inner angle of tooth cut off. Shell-heap D. Cat. No. VIII-B-619a. (Page 60.)

FIGURE 23. Carving knife made of the upper incisor of a beaver, cut off across the inner angle from the root end to near the artificially sharpened natural cutting edge. Shell-heap D. Cat. No. VIII-B-619b. (Page 60.)

FIGURE 24. Carving knife made of the upper incisor of a beaver with cutting edge ground off obliquely from side to side. Eastern part of shell-heap N. Cat. No. VIII-B-820. (Page 60.)

FIGURE 25. Carving knife made of the upper incisor of a woodchuck with cutting edge ground off obliquely from side to side. Shell-heap A. Cat. No. VIII-B-1071. (Page 60.)

FIGURE 26. Carving knife made of a longitudinal section of an upper incisor of a beaver with irregular artificial edge sharpened above. Shell-heap A. Cat. No. VIII-B-1062c. (Page 60.)

FIGURE 27. Less than a longitudinal half of an upper incisor of a beaver rubbed flat and lacking part of the root end. Shell-heap D. Cat. No. VIII-B-617a. (Page 60.)

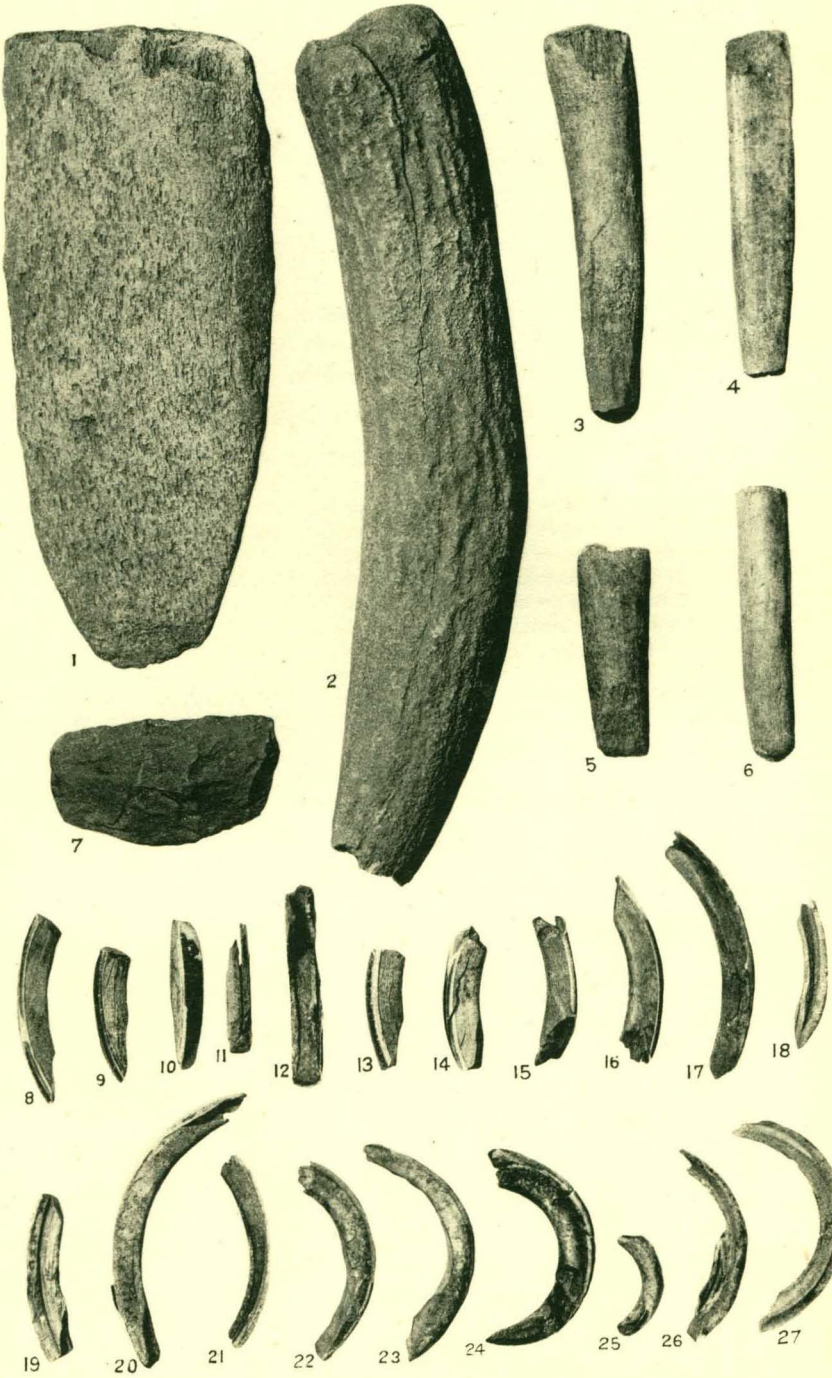
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PLATE XVII

Scrapers, awls, and needles

FIGURE 1. Scraper chipped from jasper. Shell-heap D. Cat. No. VIII-B-636a. (Page 62.)

FIGURE 2. Scraper chipped from a white quartz pebble. Shell-heap D. Cat. No. VIII-B-637a. (Page 62.)

FIGURE 3. Tip of an awl made of a piece of a bone of a bird. Shell-heap A. Cat. No. VIII-B-1116b. (Page 64.)

FIGURE 4. Awl made of a piece of bone. Shell-heap D. Cat. No. VIII-B-627a. (Page 64.)

FIGURE 5. Awl made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1124. (Page 64.)

FIGURE 6. Awl made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1102. (Page 64.)

FIGURE 7. Awl made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1101. (Page 64.)

FIGURE 8. Awl made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1128. (Page 64.)

FIGURE 9. Awl made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1100. (Page 64.)

FIGURE 10. Awl made of a piece of bone. Shell heap A. Cat. No. VIII-B-1112b. (Page 64.)

FIGURE 11. Awl made of a bone. Shell-heap A. Cat. No. VIII-B-1098a. (Page 64.)

FIGURE 12. Tip of a fish spine. Shell-heap A. Cat. No. VIII-B-1139a. (Page 64.)

FIGURE 13. Awl made of a bone of a bird. Shell-heap A. Cat. No. VIII-B-1107. (Page 64.)

FIGURE 14. Awl made of a bone of a bird. Shell-heap A. Cat. No. VIII-B-1106. (Page 64.)

FIGURE 15. Awl made of a splint bone of a moose. Shell-heap A. Cat. No. VIII-B-1090. (Page 64.)

FIGURE 16. Awl made of an ulna of a small mammal. Shell-heap A. Cat. No. VIII-B-1098b. (Page 64.)

FIGURE 17. Knobbed tip of a needle made of bone. Shell-heap A. Cat. No. VIII-B-1149a. (Page 65.)

FIGURE 18. Needle made of bone. Shell-heap A. Cat. No. VIII-B-1148a. (Page 65.)

FIGURE 19. Needle made of bone. Shell-heap A. Cat. No. VIII-B-1149b. (Page 65.)

FIGURE 20. Needle made of bone. Shell-heap A. Cat. No. VIII-B-1151. (Page 65.)

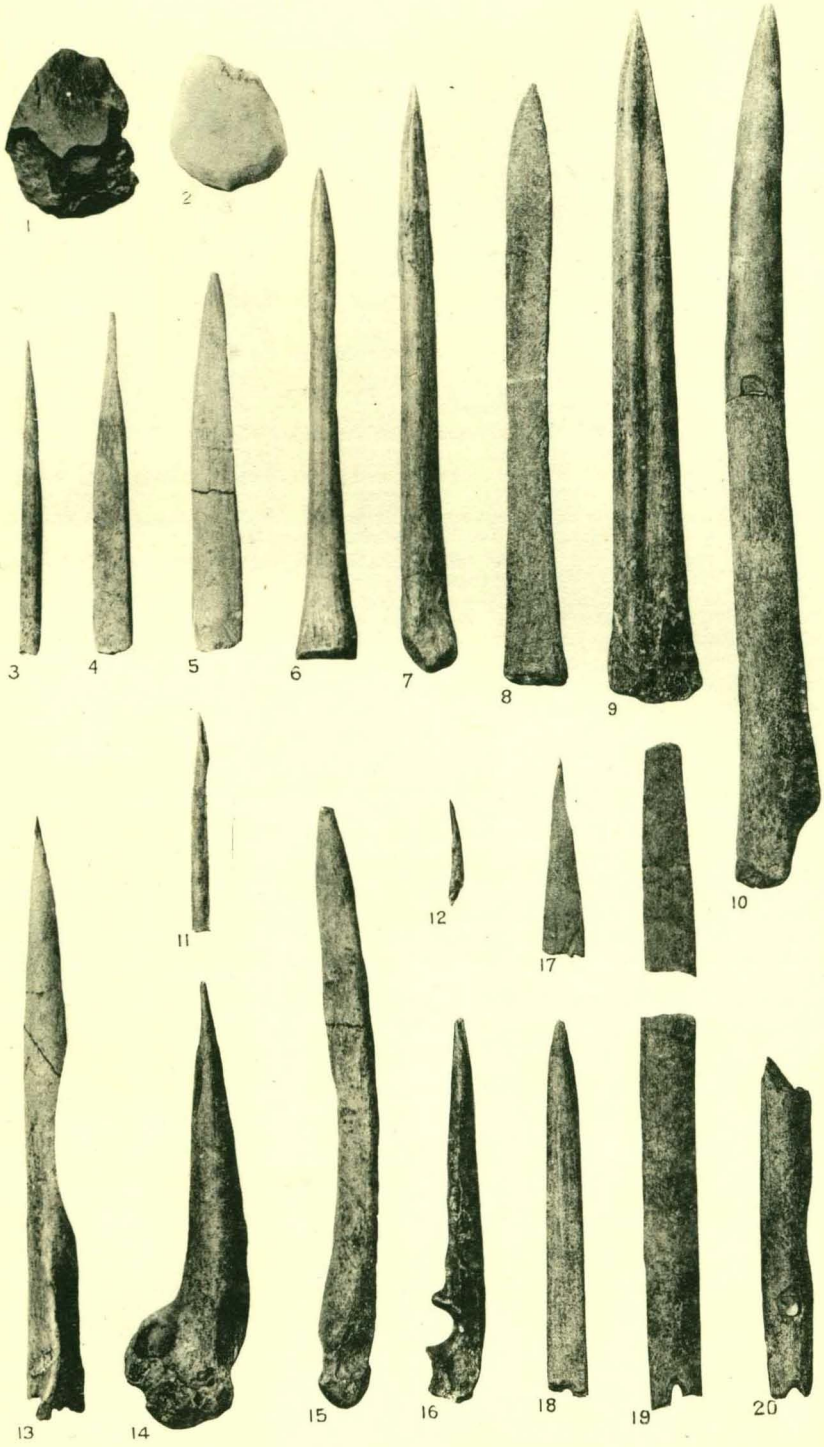
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PLATE XVIII

Processes of manufacture

FIGURE 1. Longitudinal incising, breaking, and rubbing on the edge of a pebble of slate. Shell-heap D. Cat. No. VIII-B-649. (Page 70.)

FIGURE 2. Longitudinal rubbing and breaking on the surface of a piece of slate. Shell-heap L. Cat. No. VIII-B-730. (Page 70.)

FIGURE 3. Longitudinal grooving and breaking on a piece of bone. Shell-heap A. Cat. No. VIII-B-1184. (Page 71.)

FIGURE 4. Longitudinal grooving and breaking, by means of which a piece of the wall of a long bone was cut out. Shell-heap A. Cat. No. VIII-B-1186. (Page 71.)

FIGURE 5. Longitudinal grooving and rubbing on the side edges of the walls of a long bone. Shell-heap D. Cat. No. VIII-B-522. (Page 71.)

FIGURE 6. Grooving and breaking, by means of which a part of the wall of a long bone was cut out. Shell-heap A. Cat. No. VIII-B-881. (Page 71.)

FIGURE 7. Whittling on a piece of bone. Shell-heap D. Cat. No. VIII-B-526. (Page 72.)

FIGURE 8. Two transverse incisions on a toe bone of a large carnivorous animal. Shell-heap D. Cat. No. VIII-B-519. (Page 69.)

FIGURE 9. Transverse incising and breaking and longitudinal chipping on a piece of bone that has longitudinal grooving on the edges. Shell-heap D. Cat. No. VIII-B-526. (Page 71.)

FIGURE 10. Gnawing on the ends of a toe bone. Shell-heap A. Cat. No. VIII-B-1180. (Page 17.)

FIGURE 11. Hacking and breaking, by means of which an antler prong has been cut off. Eastern part of shell-heap N. Cat. No. VIII-B-826. (Page 72.)

FIGURE 12. Surface made by grooving and breaking on a piece of walrus ivory. Shell-heap A. Cat. No. VIII-B-1189. (Page 73.)

FIGURE 13. Grooving in a piece of walrus ivory. Shell-heap A. Cat. No. VIII-B-1188. (Page 73.)

FIGURE 14. Transverse incising and breaking on a lower incisor of a beaver. Shell-heap D. Cat. No. VIII-B-612. (Page 72.)

FIGURE 15. Incised line in a canine tooth of a bear. Shell-heap D. Cat. No. VIII-B-525. (Page 72.)

FIGURE 16. Ground surface on the root end of a molar tooth of a beaver. Shell-heap D. Cat. No. VIII-B-621. (Page 69.)

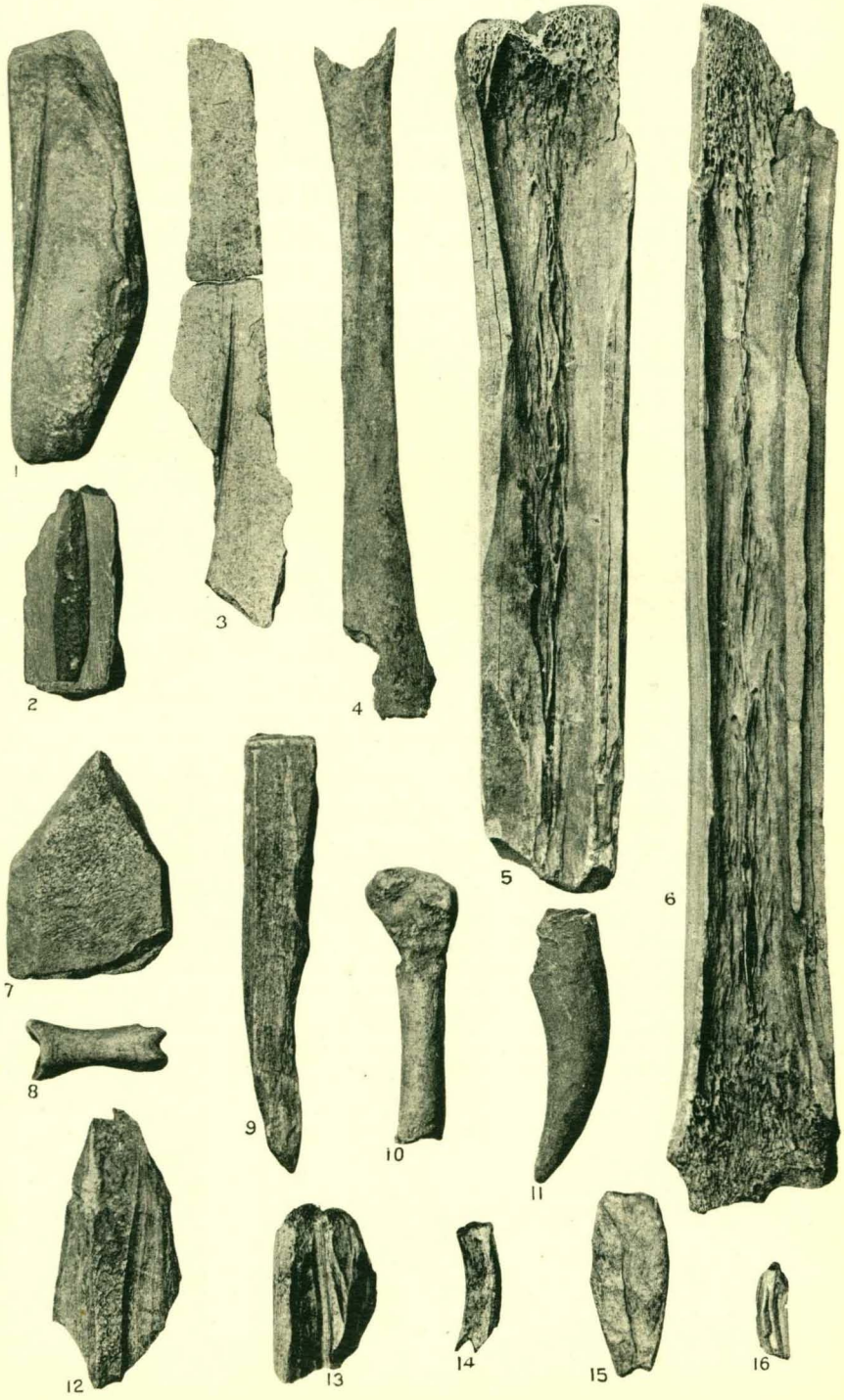
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PLATE XIX

Paints, pendants, and decorative art

FIGURE 1. Pebble of ferruginous argillite with two parts of the edge ground, probably to make red paint. Shell-heap D. Cat. No. VIII-B-479. (Page 76.)

FIGURE 2. Piece of ferruginous argillite with end ground, probably to make red paint. Shell-heap D. Cat. No. VIII-B-480. (Page 76.)

FIGURE 3. Piece of ferruginous argillite with obverse and edge rubbed, probably to make red paint. Shell-heap A. Cat. No. VIII-B-1211. (Page 76.)

FIGURE 4. Piece of graphitic schist and argillite with three sides rubbed and grooved, probably to make black paint. Shell-heap D. Cat. No. VIII-B-478. (Page 77.)

FIGURE 5. Pendant made by perforating a canine tooth of a bear. Shell-heap A. Cat. No. VIII-B-1247a. (Page 78.)

FIGURE 6. Pendant made by perforating a canine tooth of a bear. Shell-heap A. Cat. No. VIII-B-1247b. (Page 78.)

FIGURE 7. Pendant made by perforating a canine tooth of a bear. Shell-heap A. Cat. No. VIII-B-1247c. (Page 78.)

FIGURE 8. Pendant made by perforating and incising an incisor tooth of a moose or caribou. Shell-heap A. Cat. No. VIII-B-1250. (Page 79.)

FIGURE 9. Incisor of a moose or caribou with root ground to wedge shape. Shell-heap A. Cat. No. VIII-B-1273. (Page 19.)

FIGURE 10. Fragment of a pendant made by perforating a canine tooth. Shell-heap A. Cat. No. VIII-B-1249. (Page 79.)

FIGURE 11. Pendant made by perforating a canine tooth of a seal. Shell-heap A. Cat. No. VIII-B-1248. (Page 79.)

FIGURE 12. Toe bone of a moose or caribou with hole gouged in far end. Probably an unfinished "ring" for a "ring-and-pin" game. Shell-heap D. Cat. No. VIII-B-635. (Page 80.)

FIGURE 13. Toe bone of a moose or caribou with hole gouged in far end. Probably an unfinished "ring" for a "ring-and-pin" game. Shell-heap A. Cat. No. VIII-B-1275. (Page 80.)

FIGURE 14. Incised lines on a greenish slate pebble, one side edge of which has been cut off by incising, breaking, and grinding. Shell-heap A. Cat. No. VIII-B-1219. (Page 83.)

FIGURE 15. Incised lines on a fragment of a pebble. Shell-heap D. Cat. No. VIII-B-667. (Page 84.)

FIGURE 16. Four rows of incised transverse lines on an awl-like object made of a piece of bone. Shell-heap A. Cat. No. VIII-B-1103. (Page 84.)

FIGURE 17. Five rows of incised transverse notches on an object made of bone. Bought of Joseph Philip, an Indian living on Indian island. Probably from shell-heap B. Cat. No. VIII-B-452. (Page 84.)

FIGURE 18. Row of pits, some of them filled with red colour, on the edges, and groove on the sides of an object made of antler. Shell-heap A. Cat. No. VIII-B-1156. (Page 84.)

FIGURE 19. Incised lines on the sides and notches on the edges of an object, probably a rocking stamp or possibly a pendant, made of bone or antler. Shell-heap M. Cat. No. VIII-B-804. *See* Plate IX, figures 9, 10. (Page 84.)

FIGURE 20. Incised, V-shaped figures with hatching, on an object made of antler. Shell-heap D. Cat. No. VIII-B-609. (Page 84.)

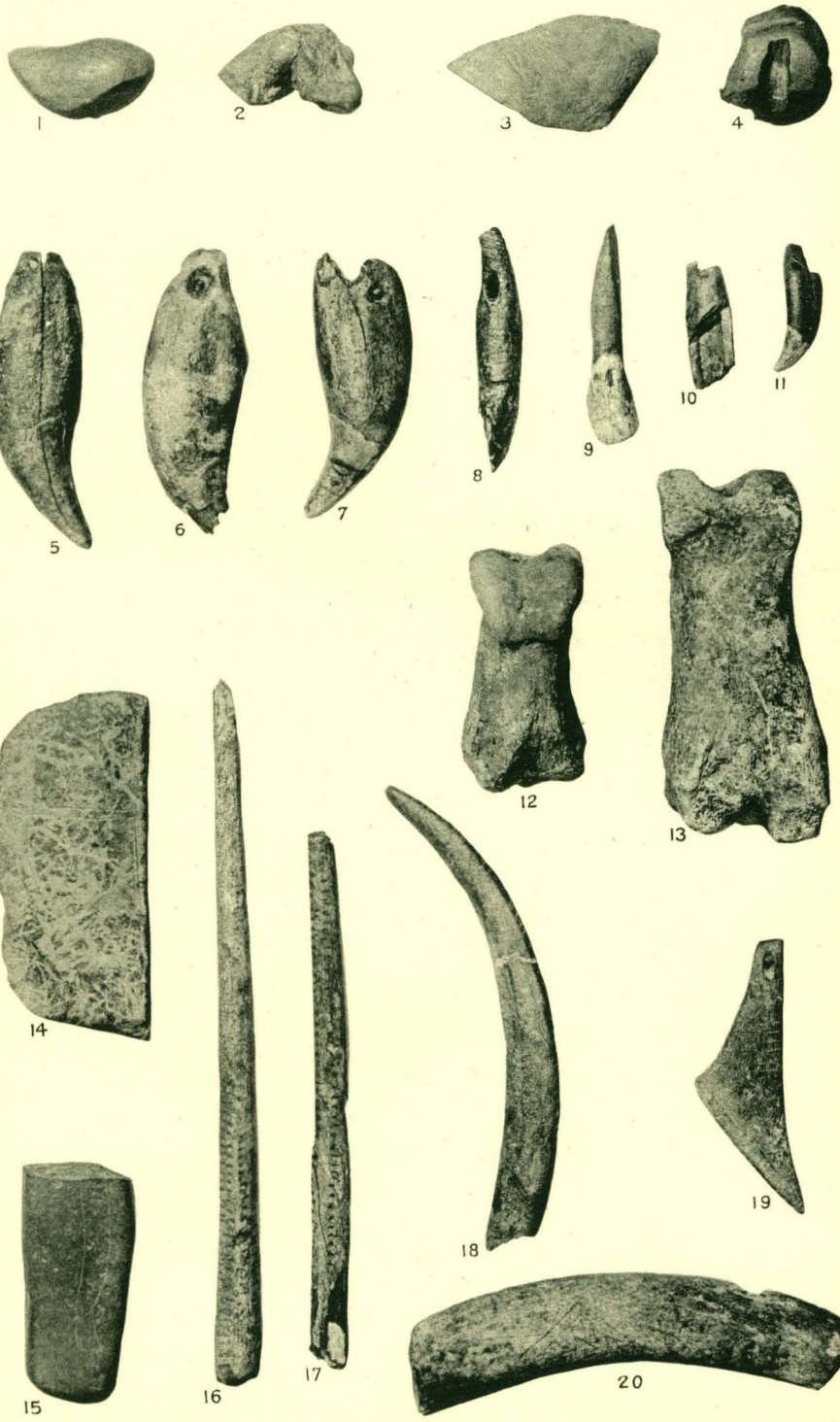
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PLATE XX

Specimens in the Patterson collection, Dalhousie University, Halifax. From Mergomish Harbour, Nova Scotia, and Bocabec, New Brunswick.

FIGURE 1. Toggle point for harpoon, made of bone. Shell-heap O. Cat. No. 197. (Page 34.)

FIGURE 2. Toggle point for harpoon, made of bone. Shell-heap O. Cat. No. 198. (Page 34.)

FIGURE 3. Celt-like object, made of slate. The prehistoric cemetery. Cat. No. 123. (Page 68.)

FIGURE 4. Object made of walrus ivory. The Millar farm, Kerr point. Cat. No. 185. (Page 20.)

FIGURE 5. Wedge made of a bone of a whale. The Millar farm, Kerr point. Cat. No. 188. (Page 56.)

FIGURE 6. Knife made of an incisor of a beaver in a handle made of antler. Bocabec, New Brunswick. Cat. No. 327. (Page 61.)

FIGURE 7. Pipe made of grey soapstone or schistose slate. The prehistoric cemetery. Cat. No. 175. (Page 82.)

FIGURE 8. Pipe made of grey sandstone, apparently modern. Big island. Cat. No. 177. (Page 82.)

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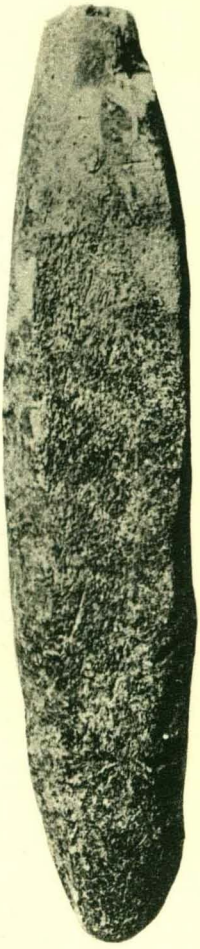

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PLATE XXI

Specimens from modern Indians for comparison

FIGURE 1. Eel spear head, made of wood. Micmac Indians, Richibucto, New Brunswick. Collected by W. H. Mechling. Cat. No. III-F-59. (Page 35.)

FIGURE 2. Fish-hook made of bone, with wooden shaft. Montagnais Indians, lake St. John, Quebec. Collected by Frank G. Speck. Cat. No. III-C-205. (Page 34.)

FIGURE 3. Fork made of four splint bones of the Moose, for punching meat while it is being smoked. Montagnais Indians of lake St. John, Quebec. Collected by Frank G. Speck. Cat. No. III-C-414. (Page 36.)

FIGURE 4. Crooked knife. Micmac Indians, Richibucto, New Brunswick. Collected by W. H. Mechling. Cat. No. III-F-42. (Page 61.)

FIGURE 5. Snowshoe needle made of caribou antler. Micmac Indians, Badgers brook, Newfoundland. Collected by Frank G. Speck. Cat. No. III-F-154. (Page 66.)

FIGURE 6. Toggle made of a bear canine. Montagnais Indians, Moise river, Quebec. Collected by Frank G. Speck. Cat. No. III-C-357. (Page 79.)

FIGURE 7. Tubular pipe made of birch bark. Micmac Indians, Richibucto, New Brunswick. Collected by W. H. Mechling. Cat. No. III-F-43. (Page 82.)

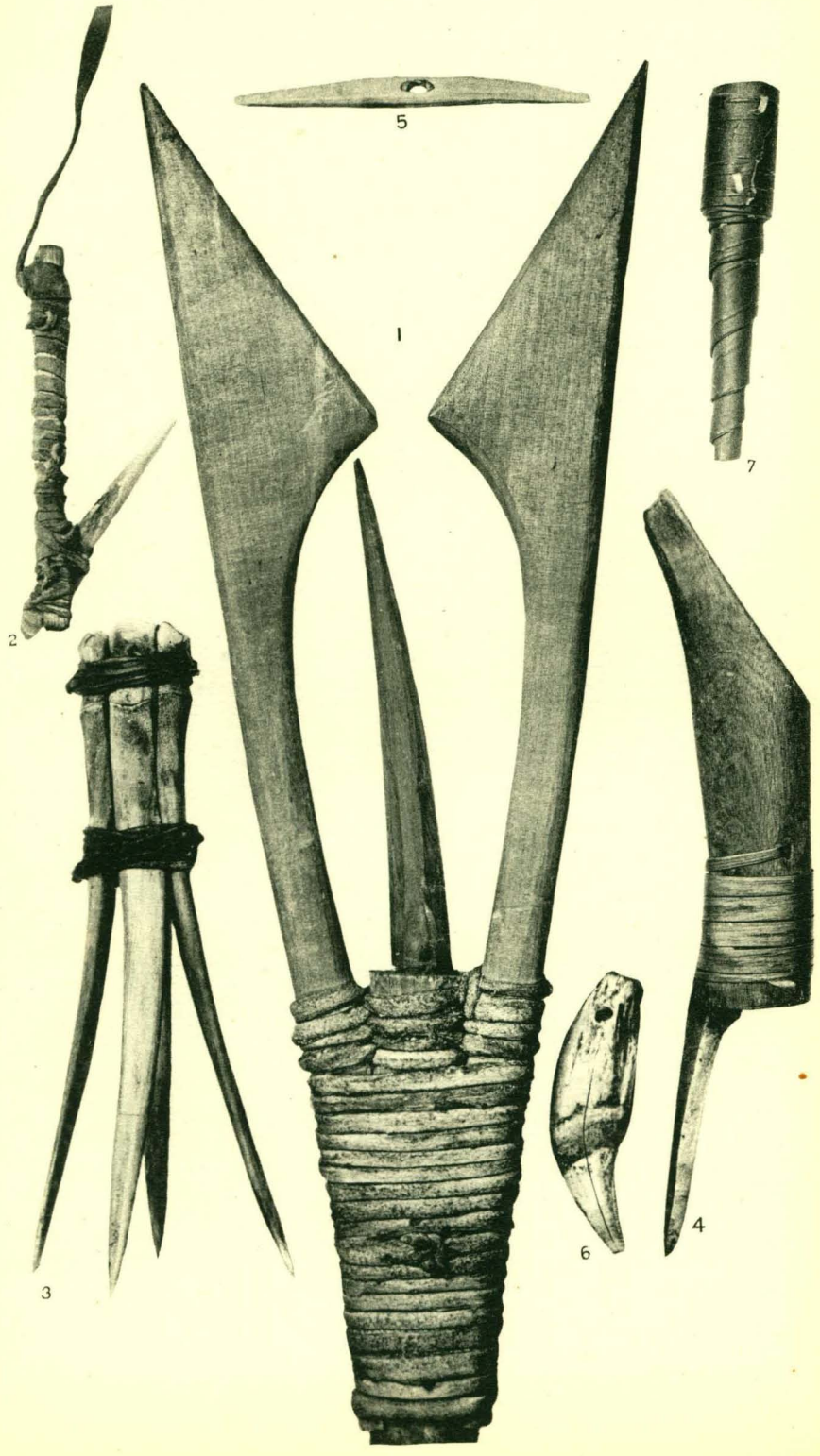
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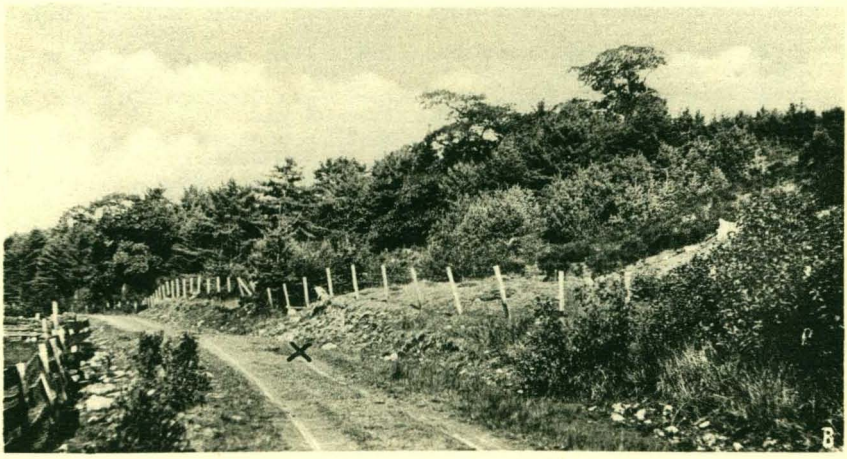
PLATE XXII

A. View from the southwest, looking across the salt marsh, with the water of Andrew cove and an island showing in the distance. The Eisenhauer shell-heap is to the left of the fence directly above the X. (Page 111.)

B. Nearer view of the shell-heap from the southeast. The heap is to the right of the road, above the X in the middle of the picture, where the whitened shells show up distinctly. The hollow at the left, where the man is seen, may be the bed of an extinct stream. The marshy character of the soil is seen at the extreme right. (Pages 111, 112.)

C. View from the west, showing the face of the excavation north and south between two survey stakes about the middle of the heap, and the maximum depth. (Page 111.)

Plate XXII



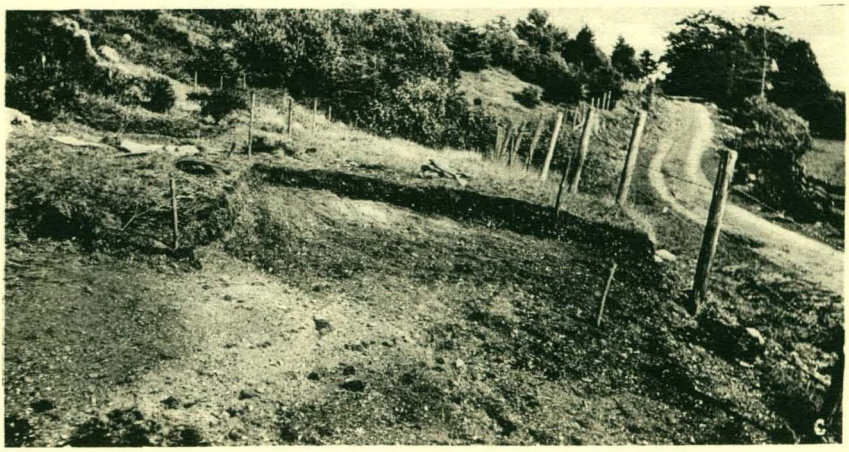


PLATE XXIII

Securing of food

FIGURE 1. Leaf-shaped point chipped from quartz. From general digging. Cat. No. VIII-B-223. (Pages 114, 116, 121, 124.)

FIGURE 2. Leaf-shaped point chipped from mottled, light maroon chert. From about 8 inches deep. Cat. No. VIII-B-69. (Pages 114, 116, 121, 124.)

FIGURE 3. Crude, leaf-shaped point chipped from grey, siliceous slate. From about 8 inches deep. Cat. No. VIII-B-216. (Pages 114, 116, 121, 124.)

FIGURE 4. Crude, leaf-shaped point chipped from reddish jasper. From about 12 inches deep. Cat. No. VIII-B-219. (Pages 114, 116, 121, 124, 125.)

FIGURE 5. Crude, leaf-shaped point chipped from quartz. From about 8 inches deep. Cat. No. VIII-B-68. (Pages 114, 115, 116, 121, 124.)

FIGURE 6. Crude point chipped from chert. From general digging. Cat. No. VIII-B-217. (Pages 114, 116, 121.)

FIGURE 7. Crude point chipped from quartz, with tip missing. From general digging. Cat. No. VIII-B-207*b*. (Pages 114, 124.)

FIGURE 8. Stemmed and shouldered, but not barbed, point chipped from light brown quartzite. From general digging. Cat. No. VIII-B-211. (Pages 115, 124.)

FIGURE 9. Stemmed and shouldered, but not barbed, point chipped from veined reddish jasper, with tip missing. From general digging. Cat. No. VIII-B-206. (Pages 115, 124.)

FIGURE 10. Stemmed and barbed point chipped from dark grey, siliceous slate, with tip missing. From about 3 inches deep. Cat. No. VIII-B-63. (Pages 115, 124.)

FIGURE 11. Stemmed and barbed point chipped from light brown quartzite, with tip missing. Cat. No. VIII-B-213. (Pages 115, 124.)

FIGURE 12. Stemmed and slightly barbed point chipped from chert. Tip broken and re-chipped to a chisel-like edge. From about 12 inches deep. Cat. No. VIII-B-205. (Pages 115, 124.)

FIGURE 13. Bone point with tip missing. From about 12 inches deep. Cat. No. VIII-B-331. (Page 115.)

FIGURE 14. Shows how bone points like the one illustrated in figure 13 may have been attached to the shaft. (Page 115.)

FIGURE 15. Slender bone point for arrow or harpoon with one side grooved from end to end. From about 14 inches deep. Cat. No. VIII-B-64. (Page 115.)

FIGURE 16. Fragment of bone point for harpoon. From general digging. Cat. No. VIII-B-67. (Page 116.)

FIGURE 17. Fragment of unfinished bone point for harpoon, with line hole. From about 12 inches deep. Cat. No. VIII-B-66. (Page 116.)

FIGURE 18. Fragment of unfinished bone point for harpoon, with line hole. From about 3 inches deep. Cat. No. VIII-B-322. (Page 116.)

FIGURE 19. Bilaterally barbed bone point for harpoon. From about 6 inches deep. Cat. No. VIII-B-65. (Page 116.)

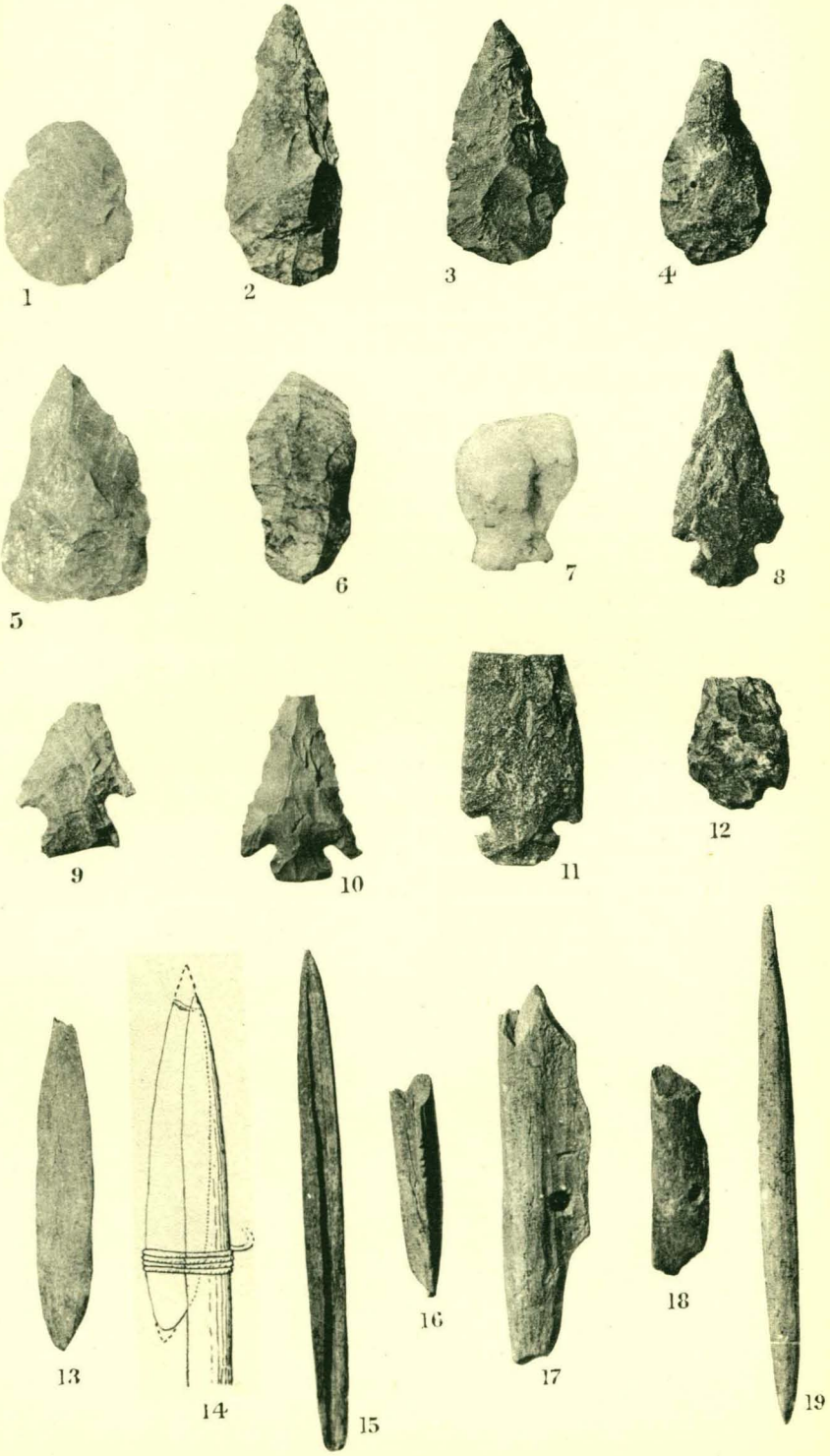

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PLATE XXIV

The manufacture of points for arrows and knives

FIGURE 1. Quartz pebble on which chipping has been commenced. From general digging. Cat. No. VIII-B-447*e*. (Page 115.)

FIGURE 2. Quartz pebble from which two long chips have been removed. From general digging. Cat. No. VIII-B-129*g*. (Page 115.)

FIGURE 3. Quartz pebble chipped and battered on nearly all sides. From general digging. Cat. No. VIII-B-447*a*. (Page 115.)

FIGURE 4. Large chip of quartz retaining waterworn surface of pebble on one side and showing chipping on reverse. From general digging. Cat. No. VIII-B-98. (Page 115.)

FIGURE 5. Large chip of quartz showing chipping on one side and reverse side retaining waterworn surface of pebble. From general digging. Cat. No. VIII-B-99*a*. (Page 115.)

FIGURE 6. Large form chipped from quartz. From about 3 inches deep. Cat. No. VIII-B-95. (Pages 115, 124.)

FIGURE 7. Crude, nearly completed, form chipped from quartz, retaining part of waterworn surface of pebble at one end. From about 8 inches deep. Cat. No. VIII-B-444. (Pages 115, 124.)

FIGURE 8. Crude form chipped from quartz. From general digging. Cat. No. VIII-B-446*a*. (Pages 115, 124.)

FIGURE 9. Crude, leaf-shaped form chipped from quartz. From general digging. Cat. No. VIII-B-445*a*. (Pages 115, 124.)

FIGURE 10. Crude, leaf-shaped form chipped from quartz. From about 14 inches deep. Cat. No. VIII-B-97. (Pages 115, 124.)

FIGURE 11. Small, leaf-shaped form chipped from quartz. From general digging. Cat. No. VIII-B-222. (Pages 115, 124.)

FIGURE 12. Crude, leaf-shaped form chipped from grey chert. From general digging. Cat. No. VIII-B-221. (Pages 115, 124.)

FIGURE 13. Profile of specimen illustrated in figure 12, showing asymmetry.

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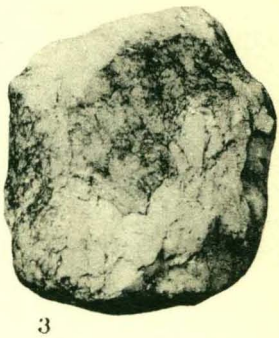

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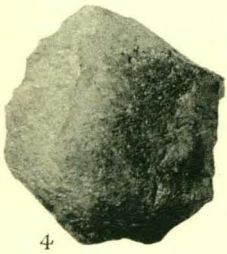

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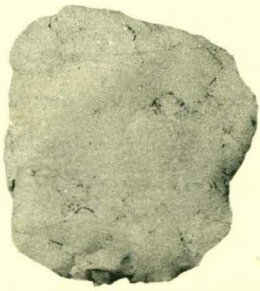

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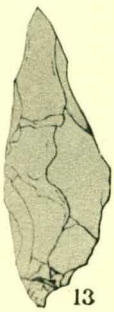

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PLATE XXV

Pottery

FIGURE 1. Fragment of pottery showing shell tempering. From about 12 inches deep. Cat. No. VIII-B-70. (Page 117.)

FIGURE 2. Fragment showing stone tempering. From between 8 and 14 inches deep. Cat. No. VIII-B-257*w*. (Page 117.)

FIGURE 3. Fragment with no recognizable tempering—though the angular cavities may have contained pieces of shell—showing scarification and coiling. From between 8 and 14 inches deep. Cat. No. VIII-B-257*a*. (Pages 117, 118.)

FIGURE 4. Fragment of coiled ware. From general digging. Cat. No. VIII-B-225*l*. (Page 118.)

FIGURE 5. Fragment showing width of coil. From general digging. Cat. No. VIII-B-241*b*. (Page 118.)

FIGURE 6. Fragment of coiled ware showing scarifying. From about 12 inches deep. Cat. No. VIII-B-114*b*. (Page 118.)

FIGURE 7. Fragment showing finger-nail impressions. From between 5 and 10 inches deep. Cat. No. VIII-B-119*i*. (Page 119.)

FIGURE 8. Perforated fragment. From about 12 inches deep. Cat. No. VIII-B-72. (Page 117.)

FIGURE 9. Fragment of rim of small, undecorated pot. From general digging. Cat. No. VIII-B-235*e*.

FIGURE 10. Fragment of rim of pot, showing ornamentation. From between 8 and 12 inches deep. Cat. No. VIII-B-259*e*. (Page 120.)

FIGURE 11. Fragment of ornamented rim of pot. From about 14 inches deep. Cat. No. VIII-B-239*e*. (Pages 119, 120.)

FIGURE 12. Fragment of small pot showing stylus impressions. From general digging. Cat. Nos. VIII-B-245*o* and VIII-B-250*g*. (Page 119.)

FIGURE 13. Fragment of small pot showing ornamentation. From about 14 inches deep. Cat. No. VIII-B-105. (Page 119.)

FIGURE 14. Fragment of pot rim showing ornamentation. From about 14 inches deep. Cat. No. VIII-B-108. (Pages 119, 120.)

FIGURE 15. Fragment showing impressed lines. From about 12 inches deep. Cat. No. VIII-B-253*n*. (Page 119.)

FIGURE 16. Fragment showing ornamentation consisting of short impressed lines. From about 12 inches deep. Cat. No. VIII-B-253*f*. (Page 119.)

FIGURE 17. Fragment showing ornamentation consisting of short impressed lines. From between 8 and 14 inches deep. Cat. No. VIII-B-257*f*. (Page 119.)

FIGURE 18. Fragment showing ornamentation. From about 14 inches deep. Cat. No. VIII-B-254*t*.

FIGURE 19. Fragment ornamented with impressed lines. From between 5 and 10 inches deep. Cat. No. VIII-B-119*j*. (Pages 119, 120.)

FIGURE 20. Fragment showing ornamentation. From between 8 and 14 inches deep. Cat. No. VIII-B-257*g*. (Pages 119, 120.)

FIGURE 21. Fragment of pot rim showing ornamentation. From general digging. Cat. No. VIII-B-112. (Pages 119, 120.)

FIGURE 22. Fragment of pot rim showing ornamentation. From between 8 and 14 inches deep. Cat. No. VIII-B-257*e*. (Pages 119, 120.)

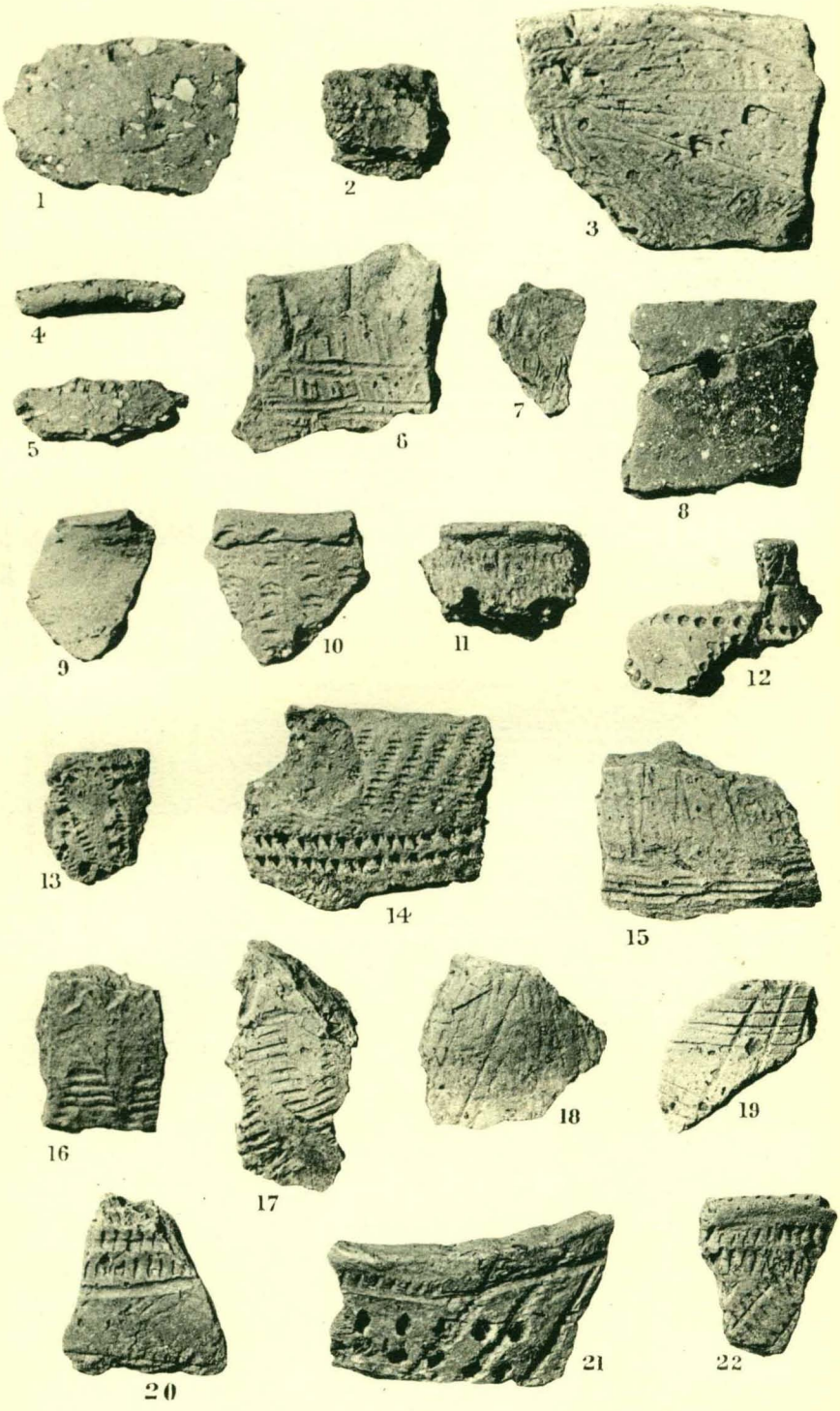
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PLATE XXVI

Pottery

FIGURE 1. Fragment showing ornamentation. From about 8 inches deep. Cat. No. VIII-B-113. (Pages 119, 120.)

FIGURE 2. Fragment showing ornamentation. From about 8 inches deep. Cat. No. VIII-B-264*a*. (Page 120.)

FIGURE 3. Fragment of rim showing ornamentation. From general digging. Cat. No. VIII-B-236. (Page 120.)

FIGURE 4. Fragment with ornamentation made with cord-wound twig. From between 6 and 8 inches deep. Cat. No. VIII-B-261*c*. (Page 120.)

FIGURE 5. Plaster cast (reverse) of the cord impressions on the fragment seen in figure 4.

FIGURE 6. Impressions similar to those seen in the fragment illustrated in figure 4, made on clay with a cord-wound twig.

FIGURE 7. Fragment of small pot. From about 8 inches deep. Cat. No. VIII-B-267*a* and *c*. (Page 119, 120, 126.)

FIGURE 8. Fragment showing ornamentation. From about 12 inches deep. Cat. No. VIII-B-114*a*. (Page 120.)

FIGURE 9. Fragment of pot rim showing ornamentation. From between 8 and 14 inches deep. Cat. No. VIII-B-256*j*. (Page 120.)

FIGURE 10. Fragment of flanged pot rim showing ornamentation. From about 12 inches deep. Cat. No. VIII-B-109. (Page 120.)

FIGURE 11. Fragment of pot rim showing crude ornamentation. Cat. No. VIII-B-267*b*.

FIGURE 12. Fragment showing ornamentation. From about 14 inches deep. Cat. No. VIII-B-251*a*. (Page 120.)

FIGURE 13. Fragment showing ornamentation. From about 6 inches deep. Cat. No. VIII-B-107. (Page 120.)

FIGURE 14. Fragment showing ornamentation. From between 4 and 6 inches deep. Cat. No. VIII-B-243*g*. (Page 120.)

FIGURE 15. Fragment of pot rim showing ornamentation. From about 18 inches deep. Cat. No. VIII-B-111*e*. (Page 126.)

FIGURE 16. Fragment of pot rim showing ornamentation. From about 12 inches deep. Cat. No. VIII-B-114*e*. (Pages 117, 119, 120.)

FIGURE 17. Fragment showing ornamentation. From about 12 inches deep. Cat. No. VIII-B-114*c*. (Page 120.)

FIGURE 18. Fragment of pot rim showing ornamentation of inside surface. From general digging. Cat. No. VIII-B-106. (Page 120.)

FIGURE 19. Fragment of pot rim showing ornamentation of top edge. From between 8 and 14 inches deep. Cat. No. VIII-B-256*h*. (Page 120.)

FIGURE 20. Fragment of pot rim showing ornamentation of top edge. From general digging. Cat. No. VIII-B-110. (Page 120.)

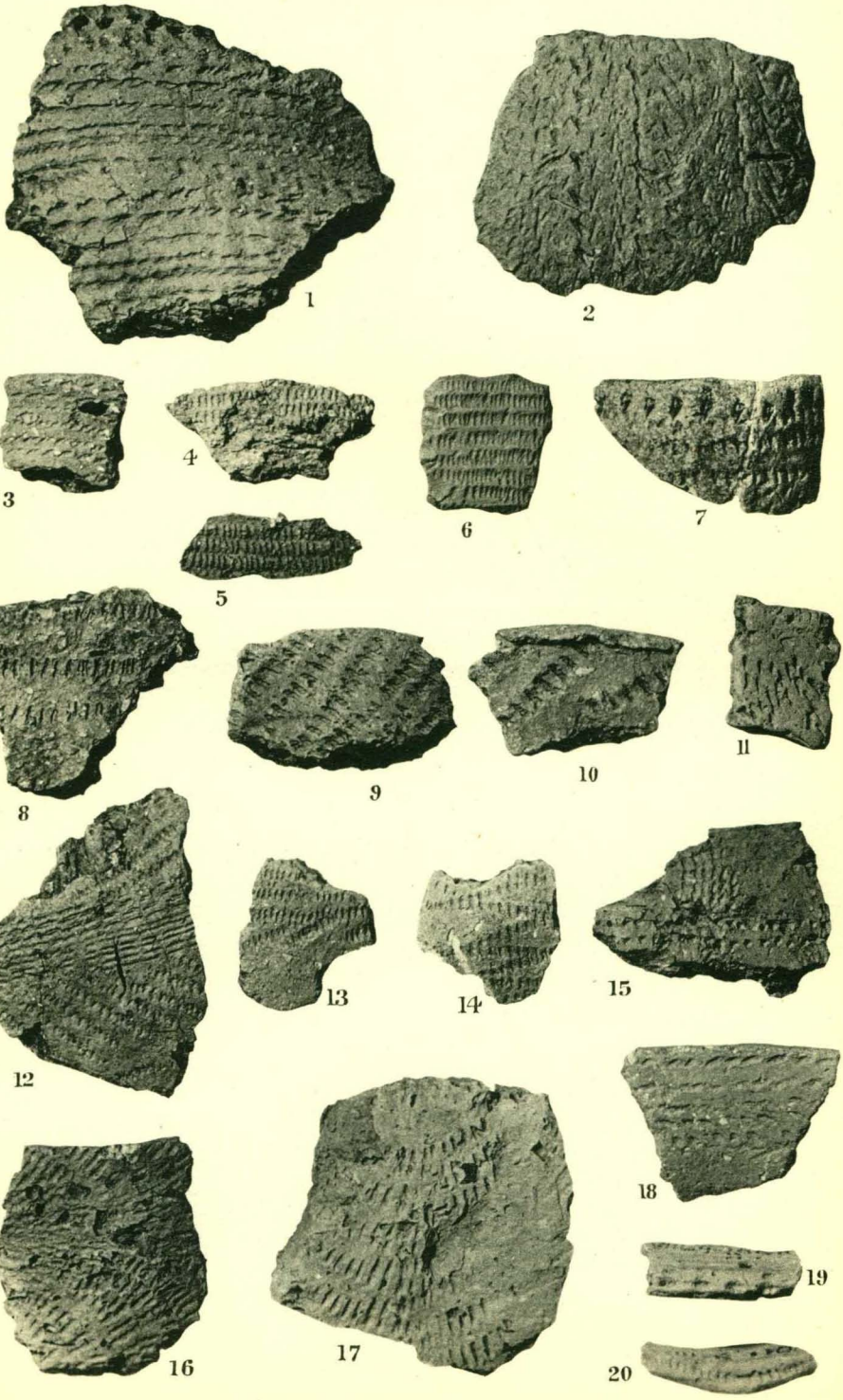
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PLATE XXVII

Pottery, etc.

FIGURE 1. Restored part of rim of pot showing ornamentation. From about 12 inches deep. Cat. No. VIII-B-114*a-o*. (Pages 116, 119, 120, 126.)

FIGURE 2. Large stone, flat on both sides, on which food may have been crushed, and which may also have been used as an anvil or chipping block and as a rubbing stone. From general digging. Cat. No. VIII-B-81. (Pages 116, 122, 125.)

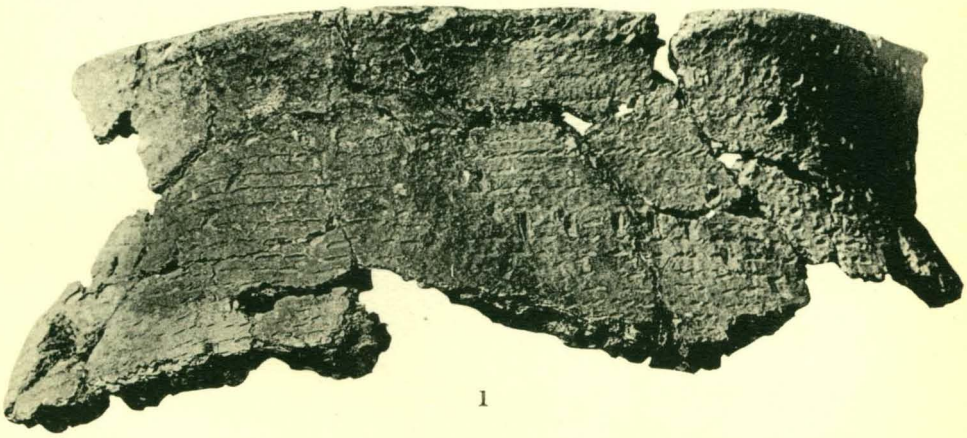

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PLATE XXVIII

Tools used by men

FIGURE 1. Crude adze or chisel made from splinter of micaceous slate. From general digging. Cat. No. VIII-B-73. (Pages 120, 124.)

FIGURE 2. Adze made of schistose slate. From about 3 inches deep. Cat. No. VIII-B-74. (Pages 120, 124, 125.)

FIGURE 3. Poll of polished adze made of argillaceous slate. From about 3 inches deep. Cat. No. VIII-B-75. (Page 121.)

FIGURE 4. Thin, double-bitted chisel made of stone. From about 4 inches deep. Cat. No. VIII-B-76. (Pages 121, 124.)

FIGURE 5. Large chipped piece of stone in process of manufacture into a celt or an adze. From general digging. Cat. No. VIII-B-90. (Pages 121, 124.)

FIGURE 6. Chipped piece of stone in process of manufature into a celt or an adze. From general digging. Cat. No. VIII-B-91. (Pages 121, 124.)

Plate XXV III

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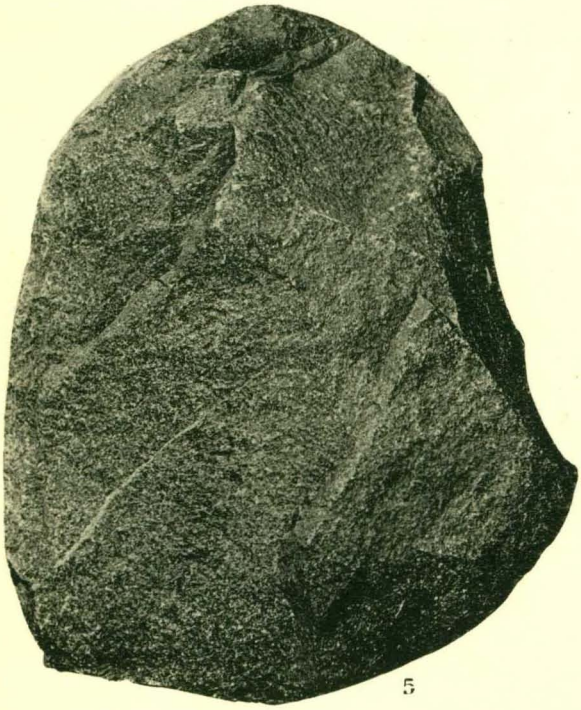

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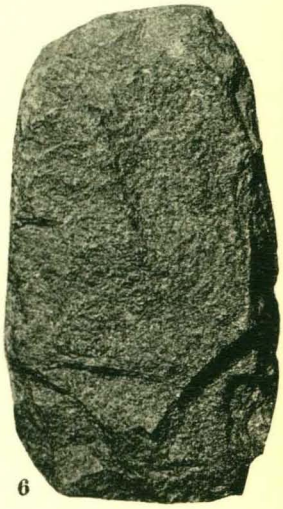

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PLATE XXIX

Manufacture of stone celts and adzes

FIGURE 1. Chipped piece of stone in process of manufacture into a celt. From surface. Cat. No. VIII-B-274. (Page 121.)

FIGURE 2. Chipped and battered or pecked piece of stone in process of manufacture into a celt. From general digging. Cat. No. VIII-B-286. (Pages 121, 125.)

FIGURE 3. Unfinished adze made of stone. From general digging. Cat. No. VIII-B-275. (Page 121.)

FIGURE 4. Unfinished celt or adze made of stone. From general digging. Cat. No. VIII-B-285. (Page 121.)

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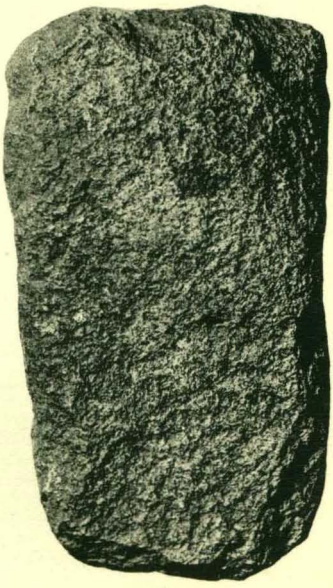

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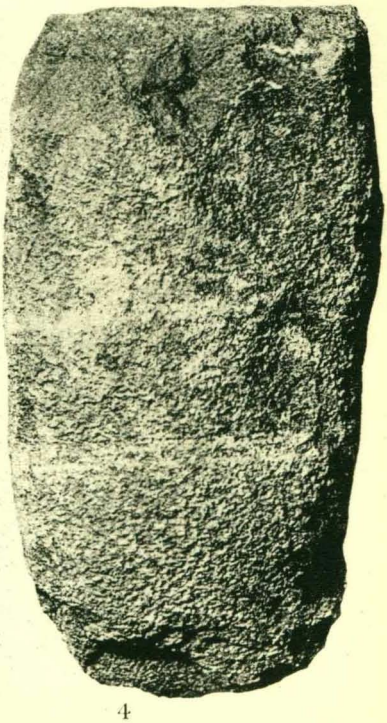

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PLATE XXX

Tools used by men

FIGURE 1. Wedge made of antler. From about 12 inches deep. Cat. No. VIII-B-79. (Pages 120–122.)

FIGURE 2. Unfinished artifact, perhaps wedge, made of antler. From about 12 inches deep. Cat. No. VIII-B-80. (Pages 120, 124.)

FIGURE 3. Red quartzite pebble used as a hammer. From general digging. Cat. No. VIII-B-78. (Pages 116, 121.)

FIGURE 4. Small quartz pebble probably used as a hammer. From general digging. Cat. No. VIII-B-129*a*. (Page 121.)

FIGURE 5. Knife made from incisor tooth of beaver. From general digging. Cat. No. VIII-B-58*d*. (Page 122.)

FIGURE 6. Knife made from incisor tooth of beaver. From general digging. Cat. No. VIII-B-84*b*. (Page 122.)

FIGURE 7. Knife made from incisor tooth of beaver, with root end cut off. From about 12 inches deep. Cat. No. VIII-B-336. (Page 122.)

FIGURE 8. Knife made from incisor tooth of porcupine. From general digging. Cat. No. VIII-B-84*a*. (Page 122.)

FIGURE 9. Worked incisor tooth of a woodchuck, probably used as a tool. From general digging. Cat. No. VIII-B-361*b*. (Page 122.)

FIGURE 10. Point for drill chipped from quartz. From general digging. Cat. No. VIII-B-129*c*. (Pages 122, 124, 125.)

FIGURE 11. Scraper chipped from jasper. From general digging. Cat. No. VIII-B-419. (Pages 122, 124.)

FIGURE 12. Whetstone. From about 9 inches deep. Cat. No. VIII-B-77. (Page 122.)

FIGURE 13. Pebble used as whetstone. From about 14 inches deep. Cat. No. VIII-B-89. (Page 122.)

FIGURE 14. Whetstone made of slate. From about 6 inches deep. Cat. No. VIII-B-313. (Page 122.)

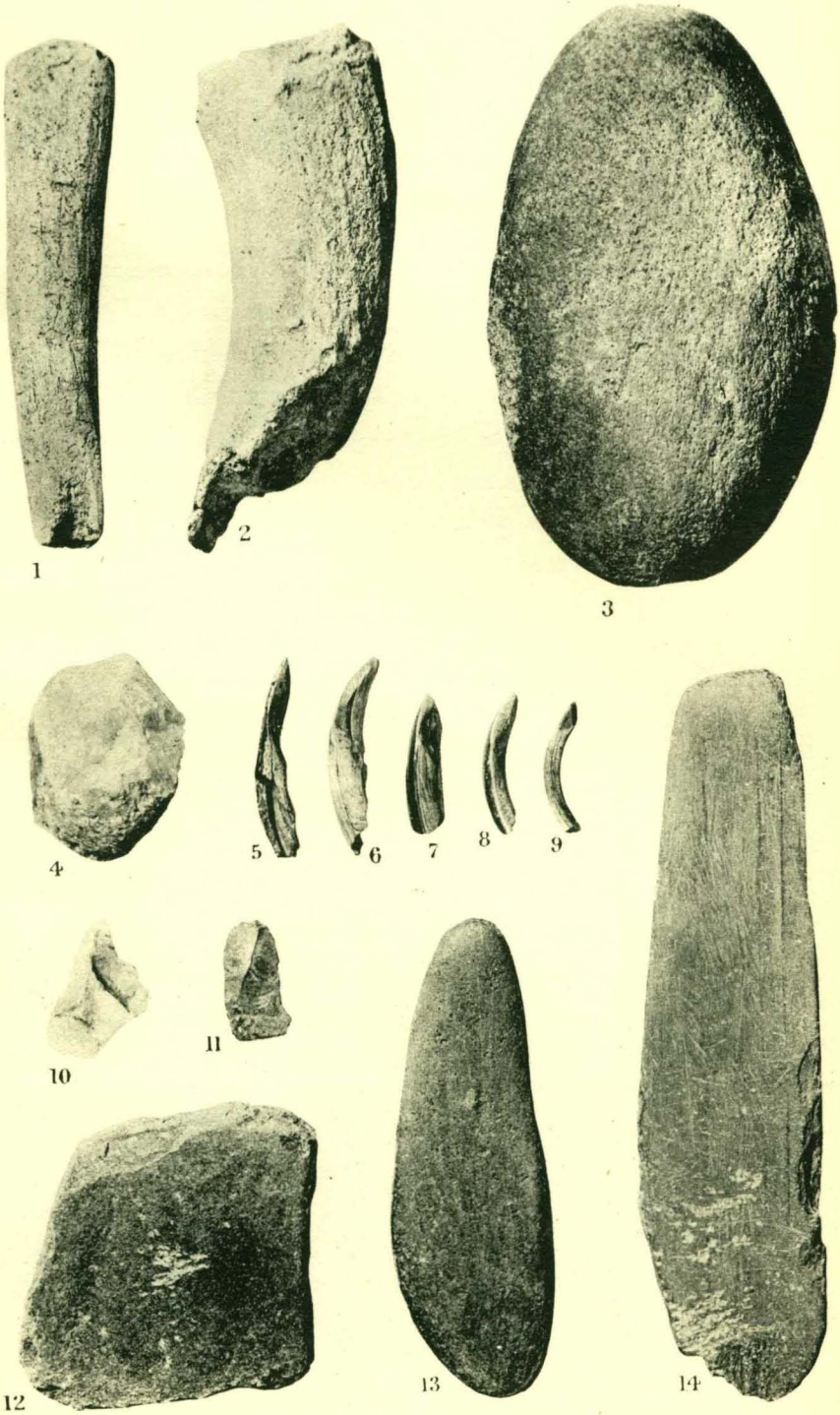
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PLATE XXXI

Tools used by women

FIGURE 1. Chip of siliceous slate, retaining part of waterworn surface of pebble, of suitable shape for manufacture into a blade for a scraper. From general digging. Cat. No. VIII-B-418. (Page 123.)

FIGURE 2. Scraper chipped from chalcedony. From about 14 inches deep. Cat. No. VIII-B-383. (Pages 123, 125.)

FIGURE 3. Crude scraper chipped from chalcedony. From about 12 inches deep. Cat. No. VIII-B-86. (Pages 123, 125.)

FIGURE 4. Crude scraper chipped from jasper. From about 12 inches deep. Cat. No. VIII-B-85. (Pages 123, 125.)

FIGURE 5. Crude scraper chipped from pinkish white flint or chert. From general digging. Cat. No. VIII-B-88. (Pages 123, 125.)

FIGURE 6. Crude scraper chipped from quartzite. From general digging. Cat. No. VIII-B-446*b*. (Pages 123, 125.)

FIGURE 7. Scraper chipped from quartz. From general digging. Cat. No. VIII-B-87. (Pages 123, 125.)

FIGURE 8. Small scraper chipped from jasper. From general digging. Cat. No. VIII-B-40. (Pages 123, 125.)

FIGURE 9. Profile of a blade for a scraper chipped from quartz, showing the usual plano-convex form. From general digging. Cat. No. VIII-B-385. (Pages 123, 125.)

FIGURE 10. Notched piece of schistose slate. From general digging. Cat. No. VIII-B-129*b*. (Page 124.)

FIGURE 11. Fragment of slender bone awl. From about 6 inches deep. Cat. No. VIII-B-83. (Page 123.)

FIGURE 12. Awl made of bird bone. From general digging. Cat. No. VIII-B-330*b*. (Pages 116, 123.)

FIGURE 13. Awl with tip missing, made from leg bone of small mammal. From about 10 inches deep. Cat. No. VIII-B-325. (Page 123.)

FIGURE 14. Awl made from splint bone of a moose. From about 10 inches deep. Cat. No. VIII-B-82. (Page 123.)

FIGURE 15. Bone awl nearly round in cross-section. From about 6 inches deep. Cat. No. VIII-B-329.

FIGURE 16. Bone awl with tip missing, hollow on reverse side. From about 10 inches deep. Cat. No. VIII-B-332.

FIGURE 17. Bone awl or perhaps point for arrow or fish spear, with tip missing. From about 8 inches deep. Cat. No. VIII-B-324. (Page 123.)

FIGURE 18. Ornamented awl made from splint bone of moose. From about 12 inches deep. Cat. No. VIII-B-102. (Pages 123, 127.)

FIGURE 19. Fragment of what was probably a bone needle. From general digging. Cat. No. VIII-B-334. (Pages 124, 126.)

FIGURE 20. Ornamented fragment of what was probably a bone needle. From about 14 inches deep. Cat. No. VIII-B-104. (Page 127.)

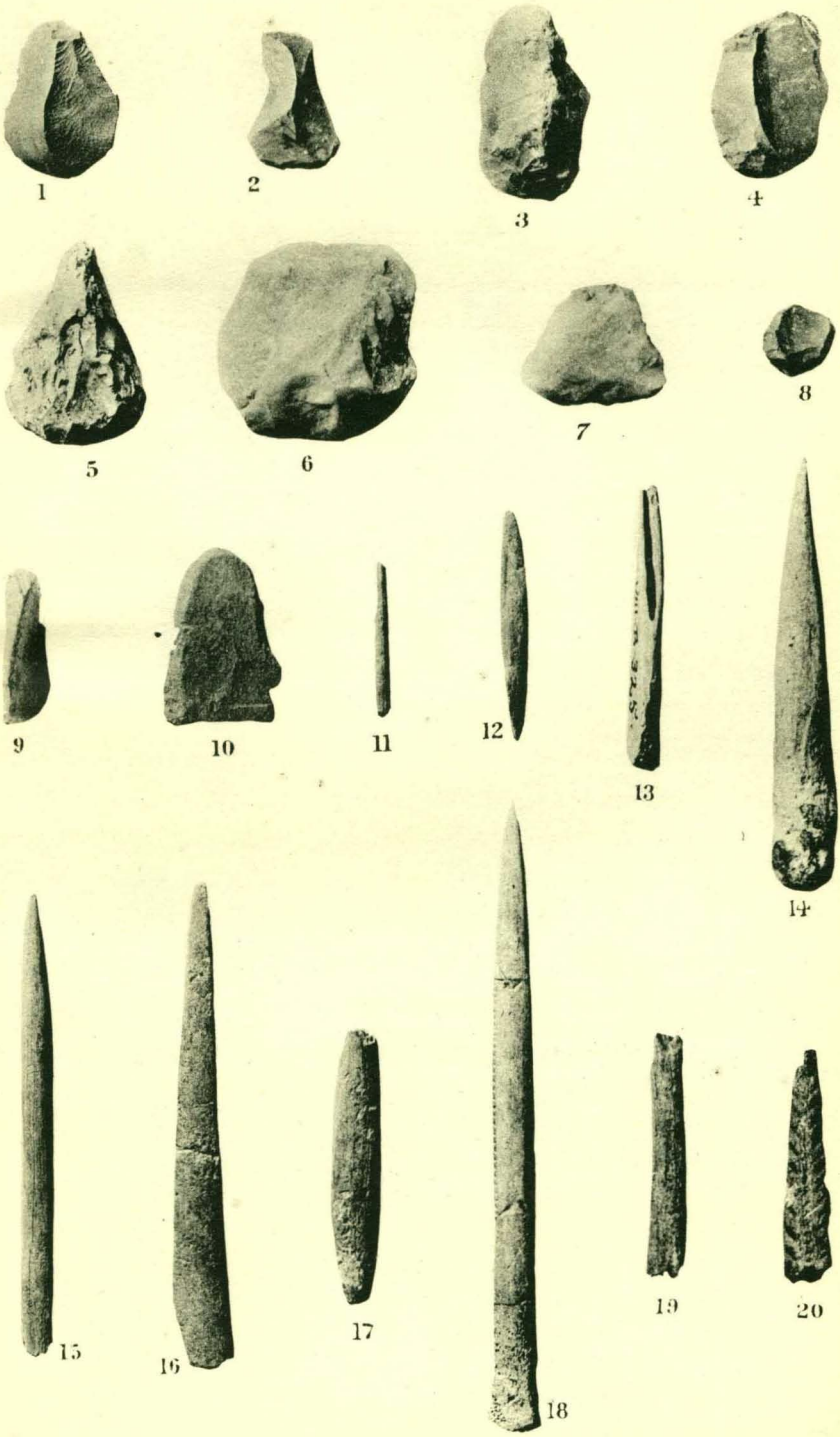
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PLATE XXXII

Processes of manufacture, ornaments, games, religious objects, and art

FIGURE 1. Part of metatarsus of moose showing method of cutting with a plough grinder. From general digging. Cat. No. VIII-B-152*o*. (Page 124.)

FIGURE 2. Piece cut from the metacarpus of a moose. From general digging. Cat. No. VIII-B-152*b*. (Page 124.)

FIGURE 3. Long strip cut from bone. From general digging. Cat. No. VIII-B-152*q*. (Page 124.)

FIGURE 4. Piece of bone showing cutting. From general digging. Cat. No. VIII-B-152*s*. (Page 124.)

FIGURE 5. Tip cut from pointed tool made of bone or antler. From general digging. Cat. No. VIII-B-341. (Page 124.)

FIGURE 6. Flat piece of bone showing transverse cutting and breaking. From general digging. Cat. No. VIII-B-201*a*. (Page 124.)

FIGURE 7. Piece of antler showing cutting. From general digging. Cat. No. VIII-B-345. (Page 124.)

FIGURE 8. Splinter of bone. From general digging. Cat. No. VIII-B-152*r*. (Page 124.)

FIGURE 9. Slightly worked splinter of bone. From general digging. Cat. No. VIII-B-34. (Page 124.)

FIGURE 10. Split incisor of beaver. From between 8 and 14 inches deep. Cat. No. VIII-B-177. (Page 124.)

FIGURE 11. Split and slightly rubbed incisor tooth of beaver. From about 3 inches deep. Cat. No. VIII-B-174*a*. (Page 124.)

FIGURE 12. Piece of bone showing chipping or flaking along one edge. From general digging. Cat. No. VIII-B-340*a*. (Page 125.)

FIGURE 13. Worked splinter of slate. From about 7 inches deep. Cat. No. VIII-B-308. (Page 124.)

FIGURE 14. Piece of stone showing pecking or bruising. From general digging. Cat. No. VIII-B-310. (Page 125.)

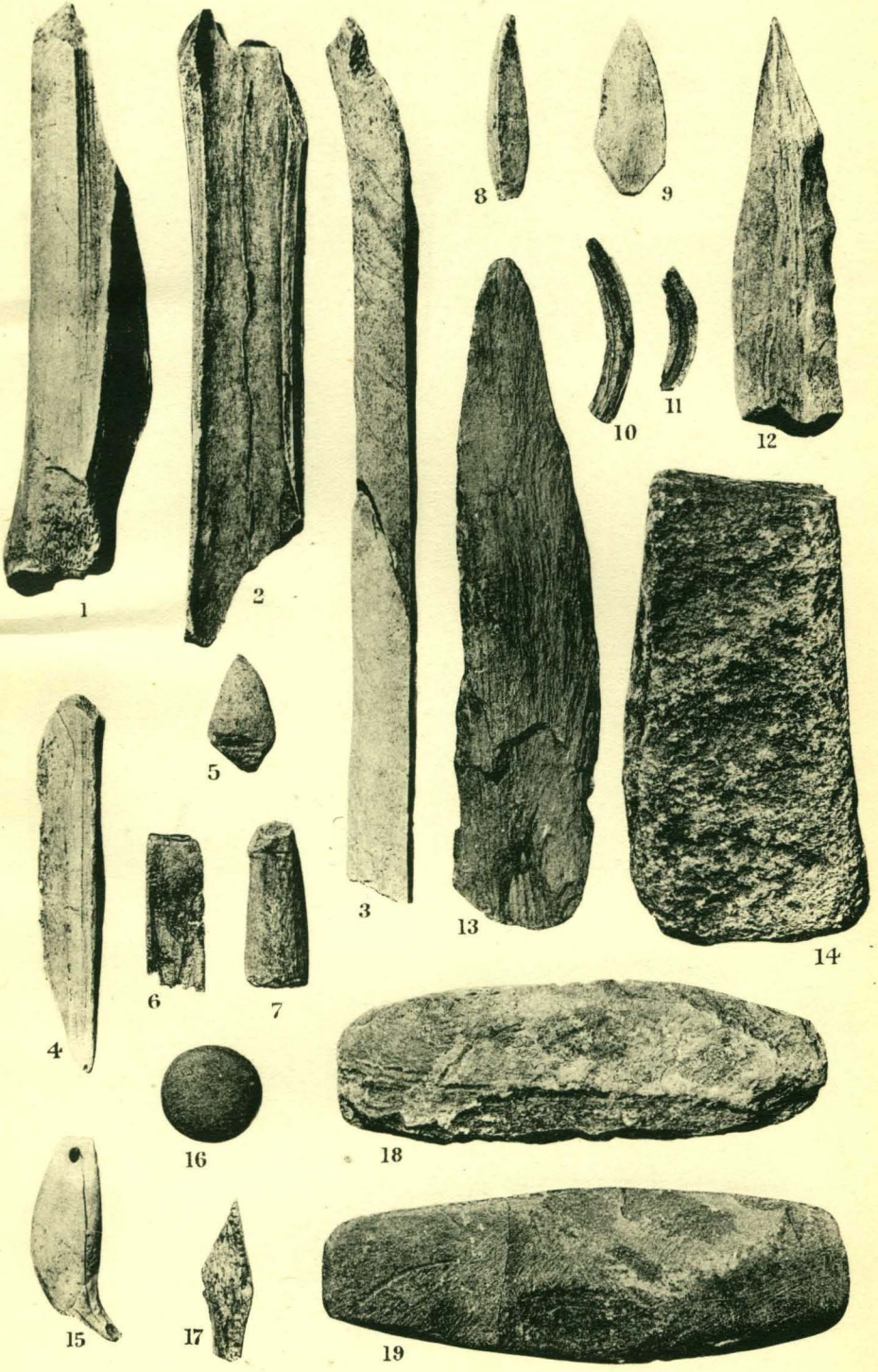
FIGURE 15. Pendant made from canine tooth of a bear. From about 8 inches deep. Cat. No. VIII-B-100. (Page 126.)

FIGURE 16. Pebble, perhaps used in a game. From general digging. Cat. No. VIII-B-101. (Page 126.)

FIGURE 17. Notched fragment of bone, perhaps tally. From general digging. Cat No. VIII-B-103. (Page 127.)

FIGURE 18. Chipped object of slate, perhaps unfinished gorget. From about 6 inches deep. Cat. No. VIII-B-92. (Pages 125, 126.)

FIGURE 19. Unfinished slate object, perhaps gorget. From general digging. Cat. No. VIII-B-312. (Pages 125, 126.)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