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THE JESUP NORTH PACIFIC EXPEDITION.

IV.—Shell-Heaps of the Lower Fraser River,
British Columbia.

By HARLAN I. SMITH.

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IV.—SHELL-HEAPS OF THE LOWER FRASER RIVER, BRITISH COLUMBIA.

BY HARLAN I. SMITH.

PLATES VI—VII.

THE Fraser River empties into the Gulf of Georgia, forming a delta which extends along the coast about fourteen miles, from near the northern boundary of the United States, to Point Gray, about six miles southwest of Vancouver, B. C. The effect of the tide is felt for about twenty miles above the mouth; and for a still greater distance we find one or both shores formed of alluvial soil, which at certain seasons receives deposits from the river. The westerly winds, in ascending the slopes of the Coast Range, precipitate their moisture, and consequently there is a considerable amount of rain, principally in winter. Vegetation is dense and luxuriant. Many of the trees are gigantic.

The Indians inhabiting this region subsist largely upon fish and shell-fish. Whales, seals, bear, deer, etc., roots, and berries are also used. The people depend largely upon the wood of the cedar and other trees for the manufacture of their implements and utensils. The bark of the cedar is made into garments, bags, mats, etc. They build immense houses of cedar-planks. The arts of carving and painting, which are characteristic of the North Pacific coast, are well developed. Most of the implements or objects of art are made of wood.

The most extensive remains of the early inhabitants of the coast are shell-heaps made up of layers of shell and other refuse from their villages. They are found on many flats along the coast, and at the mouths of most streams where the beach is smooth enough for canoe-landing. In front of many shell-heaps where the beach is covered with boulders, the stones have been removed to make canoe-paths up from the water; and at low tide these paths, which are at right angles to the beach, may yet be seen, clearly marked by the boulders piled in parallel rows at their sides. These often direct attention to a shell-heap at the edge of the forest which might otherwise be passed unobserved. The streams were highways to the interior, sources of fresh water and of food. At their mouths mud flats are formed, on which shell-fish live.

The typical shell-heap is several hundred yards in length, about thirty yards in width, and three or four feet in height. Others are miles in length, and some reach a height of over nine feet (Plate VII, Fig. 1).

The age of some of these heaps is considerable, as indicated by the presence of Douglas-fir stumps over seven feet in diameter (Plate VII, Fig. 2) standing on nine feet of unbroken layers, many of which are only an inch or two in thickness.

One stump only four feet in diameter exhibited over four hundred rings of growth, but on the larger stumps such evidences were obliterated by decay. Judging from these stumps, the top layers of the shell-heaps cannot be less than five hundred years old, while the lower layers must have been deposited a considerable time before, to allow for the formation of nine feet of strata above them.

The shell-heap at Port Hammond, in the upper part of the Fraser Delta, is over twenty miles by water from the present seashore, where the shells, of which it is largely composed, are found. By land the nearest point of the seashore is over ten miles. Judging from the customs of the present natives, the water-route would have been used in bringing the shell-fish to the village; but the Indians prefer to live near the shell-beds. It is hard to believe that they would have carried from the present seashore the large quantities of shells which compose the shell-heap at Port Hammond. The rate of encroachment of the delta upon the sea, or of changes in the level of the land, may furnish some clew to the age of the Port Hammond shell-heaps. At present, according to information given by the late Dr. George M. Dawson, little or nothing is definitely known in regard to the geological age of the Fraser bottom-lands and the surrounding gravel-terraces.

The only object found, suggesting association with the white race, is an iron point (see p. 144); but, as this was found in a ploughed field, it may have been lost by the modern natives, and therefore does not prove that the shell-heaps, especially the layers below plough depth, are as recent as the advent of iron into this region.

The strata in the shell-heaps are often entirely composed of the remains of shell-fish, largely clams, mussels, and in some cases oysters. Vegetable mould and general refuse also make up a large part of some heaps. The shell-heaps on delta land along large rivers, as compared to those along the sea-beaches, seem to contain more black vegetable mould; most of the shells seem to be broken and in a more advanced state of decomposition; skeletons are nearly as well preserved, and are much more frequently found in order; and implements of various kinds are more numerous among the layers.

In the shell-heaps of the Lower Fraser River the skeletons and stray human bones found were deposited at the time of the formation of the layers, and were not intrusive burials, as was clearly shown by the numerous unbroken strata extending over them (Plate VI, Fig. 2). The bodies usually lie on the side, with knees close to the chest. Unlike the skeletons found in the interior, there are but few if any objects accompanying them, except in rare instances a few shell beads, copper ornaments, and chipped and ground stone points for arrows, spears, etc. Such specimens, as well as other artifacts, were frequently found scattered in the layers, and it is likely that they were only accidentally near the skeletons. This is particularly true of the stone points.

At Eburne two types of skeletons are found which belonged apparently to co-existent people, as they were excavated from the same layers. If one of these types consisted of captives or slaves, there was nothing in the manner of burial to indicate it.

The shell-heaps of Vancouver Island and of the adjacent region have been known for many years, and were mentioned by Bancroft¹ in 1875 and by Dawson² in 1877.

The large shell-heap near Eburne has been known for some years,—ever since the piece of southeast road between the end of the road running due south from Vancouver and the bridge at Eburne was cut through the middle of it. Mr. William Oliver, who was in charge of this work, observed the occurrence of artifacts, and caused the men to save such objects of antiquity as came to their notice. His observations at this time, and the collection which was then made, drew the attention of other observers to the place. The collection was secured by the writer, and is now in the American Museum of Natural History.

In 1884 Rev. H. H. Gowan and Mr. James Johnson examined this shell-heap, and secured from it a human skull which was peculiarly long and had a narrow forehead. A bone spear-point was said to have been found piercing the left temporal bone of this skull. Both skull and spear-point were deposited in the Natural History Museum of New Westminster, B. C. A photograph of the skull was sent to the Smithsonian Institution, and the writer secured two negatives of it for the American Museum of Natural History. Mrs. Ellen R. C. Weber, now of Vancouver, while living at Port Hammond some years prior to 1897, made a collection of the specimens turned up in her garden, which was on the shell-heap. Specimens have been collected also by Mr. James Scott at Port Hammond, and are in the collection of Mr. Reginald C. Brooke; while those secured by Mr. Charles Hill-Tout at Port Hammond and Eburne, and by Mr. J. Sprott at Eburne, are in the Provincial Museum. Rev. H. H. Gowan of Seattle, and Mr. James Johnson and Dr. Eden R. Walker, both of New Westminster, also have specimens from near Eburne. The collection in the Natural History Museum of New Westminster was destroyed by the fire which consumed that city on Sept. 11, 1898.

The first published account of the shell-heaps of the Lower Fraser River was by Mr. Charles Hill-Tout,³ who referred to both the large shell-heap near Eburne and the one at Port Hammond. Some of the figures in his paper are apparently of specimens collected by Mr. Oliver. Mrs. Weber⁴ has given a brief description of the shell-heap at Port Hammond, with a somewhat confused mass of legendary matter relating to it. Some specimens are described and localities and collectors are mentioned in the catalogue of the Provincial Museum.⁵

In September and October, 1897, I conducted explorations for the Jesup North Pacific Expedition in the shell-heaps of the Lower Fraser River at Port

¹ *Native Races of the Pacific States*, Vol. IV, pp. 736, 739, 740.

² Note on Some of the More Recent Changes in Level, etc. (*Canadian Naturalist*, April, 1877).

³ *Later Prehistoric Man in British Columbia* (Trans. Roy. Soc. Canada, Second Series, 1895-96, Vol. I, Sect. II, pp. 103-113). See also Christmas number of the *Mining Record*, Victoria, B. C., 1899; and Report of the British Association for the Advancement of Science, 1900, pp. 492-494.

⁴ *An Old Kwanthum Village—Its People and its Fall* (*American Antiquarian*, September and October, 1899, Vol. XXI, pp. 309-314).

⁵ *A Preliminary Catalogue of the Collections of Natural History and Ethnology in the Provincial Museum, Victoria, British Columbia* (Victoria, B. C., 1898).

Hammond. This work was continued in June, 1898, near Eburne; and in September of that year Port Hammond was revisited. The following descriptions are based upon these explorations.¹ In the field, assistance was rendered by Dr. Roland B. Dixon and Mr. Reginald C. Brooke. Thanks are due to the land-owners who allowed our explorations on their property; to Mr. Robert L. Codd, who personally facilitated explorations on his land; and to Mr. James M. Dale for specimens collected by him. The accompanying illustrations are from drawings made by Mr. Rudolf Weber, and the plates are reproductions of photographs taken by the author.

The explorations along the Lower Fraser River were largely confined to the shell-heaps at Port Hammond and Eburne.

At Port Hammond the main shell-heap is located on the alluvial ridge parallel to the north bank of the Fraser River, and is always within fifty feet of the stream, which in places has cut into the shell-layers. It extends along this ridge continuously for about half a mile downstream, beginning at the base of the gravel terrace through which a cut has been made for the Canadian Pacific Railway, and on which was located a burial-mound.² There are some oval shell-knolls on the most westerly part of the main shell-heap where it is low. There are also some such knolls on the natural ridge beyond. They occur at intervals of from perhaps a hundred to a hundred and fifty feet, and probably mark spaces where refuse was thrown between the ancient houses, or in close proximity to the doorways. It is possible, however, that they mark centres of habitation. Beyond the end of the ridge where the land is low there are a few low oval shell-heaps, probably refuse from isolated houses. Back of the ridge along which the shell-heap extends, the land is low, and in some places was swampy before the making of dikes and ditches. It is said that in the rear of the shell-heap there was formerly a water-course, which extended from near its eastern end northwestward to Pitt Meadows, and farther on into Pitt River, thus affording canoe communication from the rear of the village to the north, while the Fraser River afforded connection with the east and west.

The shell-heap is, on an average, about a hundred feet wide, and reaches a maximum height of eight feet. During unusually high floods silt is sometimes deposited on it. At least six gardens are located on the shell-heap, but parts of it are yet protected by natural vegetation. Below the surface-soil, and down to the bottom of the shell-heap, clam and mussel shells are found mingled with charcoal, a very few oyster-shells, and the bones of animals. Usually the purest shell-layers are found within three feet of the surface, the lower layers being

¹ Preliminary reports of this work were published as follows: The Jesup Expedition to the North Pacific Coast, (*Science*, N. S., Vol. VI, No. 145, Oct. 8, 1897, pp. 535-538); Franz Boas, Operations of the Jesup North Pacific Expedition in 1897 (*Memoirs Am. Mus. Nat. Hist.*, Vol. II, June 16, 1898, pp. 7-11); Harlan I. Smith, Archæological Investigations on the North Pacific Coast of America (*Science*, N. S., Vol. IX, No. 224, April 14, 1899, pp. 535-539), also separate; Harlan I. Smith, Archæological Investigations on the North Pacific Coast in 1899 (*American Anthropologist*, N. S., Vol. II, July-September, 1900, pp. 563-567), also separate.

² See description of this mound in Vol. IV, p. 60.

largely of black vegetable mould, refuse, charcoal, and ashes. The general characteristics of the specimens found in the lower layers are the same as those found in the highest strata and on the surface. The fir-trees growing upon this shell-heap suggest that it is of considerable age, but there is no evidence of any very great antiquity.

Shell-heap No. 1, the oval knoll farthest downstream beyond the main site, was entirely excavated by our party. It was about a hundred feet from the river-bank, and, not having been cultivated, was covered with brush. On the northwestern edge of this heap stood the stump of a Douglas-fir tree. The fallen tree belonging to this stump measured over four feet in diameter at a point over ten feet above its base (see Plate VI, Fig. 2). A second stump stood to the north-northwest of the heap. Its roots extended over some of the lower shell-layers. The stump, reduced in thickness by fire, still measured thirteen feet in circumference at a point eight feet above the ground, where the trunk was smooth. It was twenty-nine feet in circumference at a point three feet above the ground, but below the point where the trunk begins to expand into buttresses.

The maximum depth of the layers of this shell-knoll was four feet. A vertical section from the top downward showed strata made up of the following materials: vegetable mould in which were charcoal and crackled fire-stones; shells, shell material, and charcoal; vegetable mould and charcoal; vegetable mould, ashes, burnt clay, and shell material; black soil and charcoal; shell material; black soil; and shell material. Burned and crackled stones were found throughout. These layers rested upon the original surface soil of vegetable mould overlying clay and river silt, in which at places is sand. This underlying material is like the present river-deposit, and was evidently of similar origin. It is nearly level, except in a few places where skeletons or shell material filled holes about six inches deep.

A rubbed stone and bone points were found in the clay below the shell-mound; and from the bottom shell-layer of the mound, four feet below the surface, bone points and barbed harpoon-points made of bone were secured. Most of the specimens were found in the layers three feet and a half to four feet deep. A small number, however, were from layers about two feet deep. Stray human bones were secured from both the natural clay and from the old surface mould overlying it, below the bottom layer of the heap. These were not from intrusive burials, as is indicated by the unbroken shell-layers overlying them. The skeletons (Plate VI, Fig. 2) were largely found in two strata, at depths of four feet and two feet. There seems to be a distinct separation between these two layers, which is indicated by continuous layers of shell, mould, and charcoal.

Trench No. 2 was cut in the highest part of the main shell-heap. The maximum depth of the layers was six feet, under which was the undisturbed clay ridge. Below the surface mould the layers in which shell material predominated were about two feet deep, but some were only one foot deep. Hardly any strata containing much shell material were found more than two feet under the surface;

but charcoal, clay burned to a red or yellow color, and black soil, made up the lower layers, which were often lenticular, and not clearly defined. Specimens and stones crackled by fire were found throughout, but were most numerous at a depth of two feet. Practically all the varieties of specimens found in the upper strata and on the surface are represented among the finds from the lower layers of this shell-mound. Charcoal (possibly burned roots) was also found in the apparently undisturbed clay below the black soil under the heap.

A vertical section in a part of this trench (see Plate VI, Fig. 1, to right of shovel) was made up of layers as follows:—

Dark surface-soil	1 ft. 3 in.
Decayed shell.....	2 in.
Seeds of salmon-berries and little red stones.....	1 in.
Dark soil	6 in.
Large pieces of shell	1½ in.
Charcoal.....	1 in.
Yellow soil.....	1 in.
Soil	2 in.
Shell.....	1 in.
Dark soil.....	1 in.
Yellow ash.....	1 in.
Black soil.....	1 in.
Yellow ash.....	1 in.
Charcoal and soil.....	6 in.
White ash.....	3 in.
Sand.....	1 in.
White ash, sand, and soil.....	1 ft. 3½ in.
	<hr/>
	5 ft. —

Trench No. 3 was cut in the main heap a hundred and fifty feet west of No. 2, where the ridge on which the heap stands is somewhat lower. The maximum depth of the layers was seven feet. The structure and specimens found were similar to those in No. 2. Between the layers, at a depth of three feet along the riverside, was a layer of gravel and sand, like river-silt, a foot and a half thick. This might have been deposited in a few days' time.

Trench No. 4 was cut in one of the knolls about two hundred feet east of Shell-heap No. 1. The structure and specimens were similar to those of the latter, although the depth was not as great. A Douglas-fir tree which stood on this knoll measured twelve feet eight inches in circumference at a point three feet above the ground.

Trench No. 5 was cut in the main heap about halfway between Nos. 3 and 4, east of Mr. Codd's house and quite near it. It presented a structure similar to that shown in Nos. 2 and 3.

Trench No. 6 was cut in 1898 in the main heap. It was about halfway between Nos. 3 and 5. Except that shell-layers were practically absent, it presented a structure similar to that of Nos. 2, 3, and 5.

The main shell-heap near Eburne is north of the north arm of Fraser River, and parallel to its bank. It is opposite the eastern end of Sea Island, and is located along the edge of the gravel terrace which here drops abruptly to the alluvial bottom-land, that is perhaps an eighth of a mile wide and subject to occasional inundation.

The heap is at least several hundred feet long, and is from fifty to over two hundred feet wide, covering several acres. The extreme limits have not been determined because covered with forest growth. In some places it rises to form knolls similar to those at Port Hammond, but larger. Its maximum depth is about nine feet (see Plate VII, Fig. 1), and it is made up of layers composed of the shells of clams, cockles, mussels, barnacles, of ashes and other refuse, somewhat similar to that in the heap at Port Hammond. Here, however, the lower strata are composed largely of whitish shell material similar to the material of the shell-heaps along the sea-beaches, except that it is broken into small pieces, and few large shells are entire. While at Port Hammond the lower layers overlies black earthy matter, they seem to rest here on the natural yellow gravel, with little or no signs of any old surface-soil intervening. Back of the heap the surface of this gravel is higher than the bottom-land, but it is slightly lower than that under the shell-heap. Except in places protected from erosion, it has little or no covering of surface mould.

On this heap stood a Douglas-fir stump twenty-nine feet in circumference at a point five feet above the ground, and another twenty-nine feet and a half three feet above the ground (see Plate VII, Fig. 2). The hollow log fallen from this stump was six feet seven inches in diameter at the butt, and six feet three inches at the upper end of the first section, five feet higher. Many unbroken strata under this stump extended to the eastern limit of the trench, as far as thirty feet, showing that all objects found below them, even if not directly below the stump were older than the strata under the tree.

Implements made of stone, bone, and antler, were numerous down to the depth of six feet. In the deeper layers, which consist of white shell material, implements made of bone were more plentiful than stone objects.

Two distinct types of human skeletons were found above a depth of six feet, and most frequently in the northern inland slope of the heap. The first type, of which the greater number were secured, had a skull resembling in shape those found at Port Hammond. The other type, with very narrow forehead, seems to be artificially deformed by lateral pressure.

A smaller heap, about three hundred feet long by one hundred feet wide and three feet deep, was located in an orchard on the bottom-land close to the river, about a quarter of a mile above the main shell-heap. Many objects, such as wedges made of antler, and whetstones, were found on its surface.

On the southwestern part of Sea Island there is a shell-heap extending irregularly over several acres, and at places reaching a depth of three or four feet. The heap is on a slight elevation on low land about half a mile from the sea, and

is approached by a narrow meandering water-course, through which canoes can pass at high tide.

Another shell-heap on slightly higher land is located about a mile inland from the northwestern part of the island. Undoubtedly there are many more such heaps on the islands and bottom-lands of the Fraser Delta.

Many other shell-heaps are found within a radius of twenty miles of the main heap near Eburne, but they are apparently of a different character from those of the Lower Fraser, and will be left for consideration at another time. Their locations are as follows: going northward, at and back of the present Indian village of Musquiam (at the mouth of the north arm of Fraser River), along the coast on the southern shore of Point Gray, again on its northern shore towards Vancouver, in Stanley Park and at the head of False Creek (both in Vancouver), and at the head of Burrard Inlet; going southward, at various places on the peninsula between the bottom-lands and Point Roberts.¹

The objects found in the shell-heaps were made of stone, copper, shell, bone, antler, and teeth. Pebbles made into hammers or pestles, clubs or daggers, mortars, and similar objects; trap,² chalcedony, red jasper, and quartzite, used for various kinds of chipped implements; fine and coarse sandstones made into whetstones or grinding-slabs; slate and mica schist rubbed to form fish-knives, points for arrows, spears, etc., — were among the finds. Fragments of steatite, parts of pipes, were found at Port Hammond. These pipes, however, may have been imported from the interior, where the same form is quite common.³

Celts made of green stones, both serpentine and nephrite, occurred. A pebble of nephrite (identified as such by Mr. George F. Kunz) was found at Port Hammond partly cut, and evidently in process of manufacture (p. 167). No other unfinished implements of nephrite were obtained in the Fraser Delta; but several slabs of sandstone were found, each with one edge rounded or bevelled (see p. 167), like those used to cut grooves in nephrite and serpentine. It seems probable, therefore, that while the nephrite may have been imported, it was worked in this region. Nephrite⁴ boulders have been found on the beach at the mouth of Nooksack River, in the State of Washington, only twenty-three miles to the south. Chloritic schist, mica schist, and mica were found. At Port Hammond, red ochre or clay with hematite, and white earth, were seen. Both may have been used for paint. Burnt clay was also found in both localities. Copper occurred in the form of a flat ring (p. 178), and its use for ornaments was further evinced by green stains on some of the human bones obtained.

Bones of food-animals, including the whale, seal, dolphin, elk, moose, deer,

¹ See map opposite p. 56, also pp. 59 and 61, of this volume.

² "Trap" is here used in the sense given by Kemp in his *Handbook of Rocks* (edition of 1896), p. 167, as "a useful field name for any dark, finely crystalline igneous rock." The term is intended to include what has been called "augite-porphyrity" by Dawson on p. 766 of the *American Anthropologist*, 1899, and "glassy basalt" by the writer on pp. 132, 135, 407, 408, *Memoirs of the American Museum of Natural History*, Vol. II.

³ See Vol. II, pp. 132, 154, 155, 157, 158, 428, 429; also the present volume, p. 181.

⁴ See Vol. II., p. 407.

bear, mountain-goat, beaver, otter, raccoon, and fish, were found frequently in the layers. Some of the large bones had been split, probably for extracting the marrow. Salmon, which ascend the river in immense schools, must have been a staple food of the people. Bones of the skunk, bat, cormorant, and crow also occurred. Bones of the dog (Cat. No. $\frac{16}{4289}$) were secured at a depth of two feet and a half under undisturbed shell-layers in Trench No. 2 at Port Hammond. Other bones of the dog (?) (Cat. Nos. $\frac{16}{3976}$ and $\frac{16}{5304}$) were found in the muck of the original surface below all shell-layers, four feet below the surface of Shell-heap No. 1 at Port Hammond, and two feet deep in the main shell-heap at Eburne. Bones of various mammals and birds, made into awls, scrapers, needles, etc.; wedges, celt-haftings, and carvings of antler, — occur in these shell-heaps.

The shells found in the shell-heaps at both Port Hammond and Eburne are mainly those of clams (*Saxidomus nuttalli* Conrad and *Tapes staminea* Conrad) and mussels (*Mytilus edulis* Linnæus). The latter were most numerous, and some of the other shells were brought here held by the byssi of these mussels. Shells of the cockle (*Cardium nuttalli* Conrad), the large clam (*Tresus nuttalli* Conrad), the little flat clam (*Macoma nasuta* Conrad), the whelk (*Purpura crispata* Chemnitz), and of barnacles, are fairly frequent in the layers at both places. Some of the barnacles, being attached to the inner side of the shells, show that the latter were of mollusks that had died before leaving the sea. Shells of the oyster (*Ostrea lurida* Carpenter) are occasionally seen. Shells of three species of land-snail (*Epiphragmophora fidelis* Gray, *Macrocyclus vancouverensis* Lea, and *Mesodon columbiana* Lea) were found in the main shell-heap at Eburne. The last-named species occurs at Port Hammond also. The land-snails may have crawled into the shell-heap, and were not necessarily the food of the people who threw out the shells forming the heaps. Spines and plates of the sea-urchin were frequently found in the layers.

Shell beads and dentalia (*Dentalium pretiosum* Nuttall), probably used for ornaments, were secured at Eburne. Shells of *Pecten caurinus* Gould were found in the shell-heaps at both Port Hammond and Eburne. They were hardly numerous enough to be considered as remains of food-animals. The shells may have served as rattles.

The vegetable substances found include only seeds of the salmon-berry (*Rubus spectabilis* Pursh.), fragments of red cedar (*Thuja gigantea*) preserved by copper salts, and at Port Hammond charcoal of the Douglas fir (?), cedar (?), and spruce.

Both chipped and ground stone points for arrows, knives, spears, etc., were secured. Varieties of chipped stone points are shown in Fig. 10. Some (*a* and *b*) have shoulders near the base, as if for attachment to a handle. The latter specimen is somewhat curved in a direction at right angles to its face. Its base is chipped from the upper to the under surface to a scraper-like edge. The edges are sharp. It is made of a dense black rock, consisting mostly of glass containing innumerable microlites and an occasional minute phenocryst of augite. This

material is included under the term "trap," but it is of a less granular and more glassy variety than that of which *a* is made. It is evidently identical with the glassy basalt of the interior. The large chipped object, *c*, was probably used for a knife or spear point. The specimen has a twist of about thirty degrees to the left from point to base. It was apparently sharp at both ends, but the base

is broken away. The entire surface, even to the edges, is glossy, caused by use or disintegration. The small point shown in *d* has sharp edges. Its base is not chipped, but consists of a square break. In *e* is represented a point made by slightly chipping the edges of a flake of black trap, evidently identical with that of which *a* was made.

Two points of about the same size, and somewhat similar in shape, — one chipped from crystalline quartz, the other from obsidian, — are in the collection of Mr. Reginald C. Brooke of Port Hammond. They were found on the low meadows about a mile

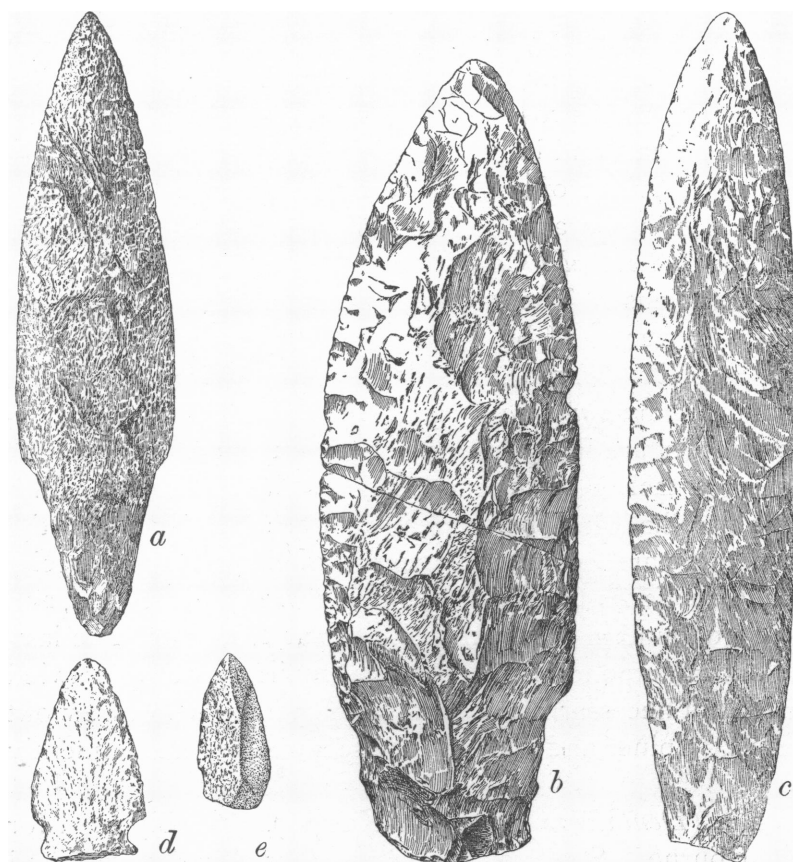


Fig. 10. Chipped Points. $\frac{1}{2}$ nat. size. *a-d*, from main shell-heap at Eburne; *e*, from main shell-heap at Port Hammond, Trench No. 3.

a (x1888), made of black trap, and found 3 ft. 4 in. deep, near Skeleton, No. 25 (x1991); *b* (x1888), of black trap; *c* (x1888), of whitish chert banded with brown, found 4 ft. deep, under Skeleton No. 5 (x1981); *d* (x1888), of crystalline quartz, found near Skeleton No. 22 (x1988); *e* (x1888), of black trap.

west of Port Hammond. In the same collection is a point about 65 mm. long, shaped like the specimen shown in Fig. 10, *a*, but chipped from chalcedony. It was found on the surface at Port Hammond. In Mr. Brooke's collection are twelve chipped points of trap, all of which are unusually small for the region, several being not over 11 mm. in length. They are not as delicately chipped as the noted chipped points of Oregon.

In general, the points chipped from trap exhibit considerable variety of design. Many are leaf-shaped cache forms, similar in shape to the point shown

¹ Mr. Hill-Tout (Later Prehistoric Man in British Columbia, p. 113) mentions several caches of inchoate forms, that have been found in this general region, made of what he calls "a dark argillaceous boulder of crystalline character, or boulders of dark gray basalt;" see also Report of the British Association for the Advancement of Science, 1900.

in Fig. 10, *c*, but smaller. The illustrations show the extreme types between which the forms vary. A few points are triangular, but with bases concave and about as wide as half the length. Some of these have notches. A few resemble closely the small variety found in the Thompson River region¹. In length they vary from 30 mm. to 208 mm., the most usual length being about 65 mm. They are found with almost equal frequency at Port Hammond and Eburne.

Six specimens chipped from cherty rocks have been found near Eburne, and one at Port Hammond; while in the whole region only two of crystalline quartz and one of obsidian have been seen by us. Those of cherty rocks are similar in shape to the specimen shown in Fig. 11, *c*, or are simply leaf-shaped cache forms. The longest specimen is shown in Fig. 10, *c*, and is 222 mm. long. The shortest is 50 mm. in length. Some of the chipped points may have been used as scrapers (see p. 169).

For the ground points, slate and mica schist were used. To the casual observer this schist resembles slate, and it may serve nearly as well for making points. Some were probably made from fragments of slate fish-knives (see p. 160). Varieties of ground points are shown in Fig. 11, *a-c*. The first (*a*) represents a thick point provided at its base with a notch, that continues in a groove, evidently for fastening the point in a slit at the end of an arrow or spear shaft. The point is thickest where the faceted surfaces meet. The next specimen (*b*) is rather thin. Its edges are sharpened by bevelling the surfaces, which round almost imperceptibly into the nearly flat sides. At the tip the edges are square across. They are either much worn or else that portion of the object was never sharpened. In *c* is represented a large slate specimen, which is well formed and serviceable. We found also a small point, similar in form to the one last described, with almost flat faces that form sharp angles with the bevelled edges. It is thinner towards the base, which is cut off square.

In Mr. Brooke's collection is a point 187 mm. long, similar to the one shown in Fig. 11, *c*. Its base is broken off, and the tip is dulled. The material is gray in color, probably a mica schist. The object was found on the surface of the low meadows about a mile west of Port Hammond.

In the same collection is a rubbed point of soft stone, 175 mm. long, leaf-shape in outline, flat at the middle, with the entire edge bevelled from each side, so that the sections are like those of the preceding specimen. The base is sharply wedge-shaped, with an outward curved edge. The tip is dull. It was

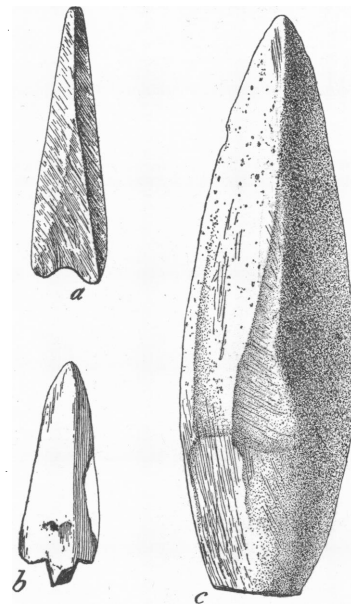


Fig. 11. Ground Points. $\frac{1}{2}$ nat. size.
a ($\frac{7}{8}$ in.), made of slate, found by road-builders in main shell-heap at Eburne, collected by William Oliver; *b* ($\frac{1}{2}$ in.), of friable mica schist, found at Port Hammond in original surface-soil 4 ft. below surface of Shell-heap No. 1; *c* ($\frac{1}{2}$ in.), of slate, from surface near main shell-heap at Port Hammond.

¹ See Vol. II, p. 136, Fig. 6; p. 409, Fig. 332, *b*, *c*.

found about a hundred feet northeast of Trench No. 2 at Port Hammond, in a ditch cut through the main shell-heap.

In general, the points rubbed from slate, argillite, and schist, are lanceolate (see Fig. 11, *c*), the basal third having rounded edges or being slightly tanged. Smaller points (see Fig. 11, *b*) have tangs of varying lengths, and a blade set off from the tang by notches or shoulders. Others are triangular, with a notch in each side near the base. The two outer edges of these triangular points are bevelled from each side, and the base is nearly square across. In section the points are flat, varying from lenticular through flattened hexagonal to lozenge shape; in length, from 187 mm. to 36 mm. One, nearly a regular hexagon in section, was found at Port Hammond. It is quite distinct from the flat type. Ground points are found in almost equal numbers at Port Hammond and Eburne, and they are more than half as numerous as the chipped points.

Some rubbed points were evidently made of pebbles; a few were made from fragments of slate fish-knives (see p. 160); while others seem to have been first chipped to the desired form, and then rubbed until the marks of chipping disappeared. This method appears particularly clear in a chipped slate point in the Oliver collection. It is shaped like the trap specimen shown in Fig. 10, *a*, and the tang is rubbed.

A fragment of a point for a spear or dagger, found one foot deep in Shell-heap No. 1 at Port Hammond, was grooved, as though it had been the intention to make smaller points out of it.

It is said that on Lulu Island, nearly opposite the small shell-heap near Eburne, and due east of Sea Island, a long hexagonal slate spear-point was found by a farmer, who stated that it was in a wooden handle which later on was destroyed.

One iron point, apparently made of a hoop (Fig. 12), is known from this region. Mr. James Scott of Port Hammond found the object in a ploughed field below the shell-heap at Port Hammond. The specimen is very thin, probably owing to loss of substance by rust. When found, it was fixed in a decayed bone handle, and held in position by means of three pegs, which passed through the bone, and fitted into the three slots cut in the iron blade. It is now in the collection of Mr. Reginald C. Brooke (see p. 134).

Fig. 12. Iron Spear or Knife Blade. Length, 178 mm. (From a drawing by Reginald C. Brooke.)



Bone objects, probably used as points for arrows or spears, are shown in Fig. 13. They are more numerous in this region than points made of stone. They are found with about equal frequency at Port Hammond and Eburne, and are much more abundant there than in the Thompson River region. The most typical form is shown in Fig. 13, *h*. Some of the objects considered as daggers (see pp. 160, 174) may have been used as spear-points.

Fig. 13, *a*, shows a specimen made of the thick bone of some large animal. The marrow-canal is visible on the under side, which is rubbed nearly flat. The point of this specimen is worn quite smooth.

Fig. 13, *b*, illustrates a point made of bone, but all the natural surfaces have been effaced by rubbing. It is lozenge-shaped in section. The base is wedge-shaped for fully an inch, but the end is cut square across. The shaft is polished from wear; but the point shows effects of later sharpening, and the base retains marks of rubbing, which were probably made to fit it into a shaft.

Fig. 13, *c*, illustrates a still longer bone point, which is one of several almost identical specimens that are probably all spear-heads. It is made of a large firm bone. The lower side is formed through nearly its entire extent by the natural surface of the bone.

The specimen shown in Fig. 13, *d*, is made of bone, and the large open bone-cells show in the middle of the under surface, except near the point, where this surface has been made convex by sharpening the edges. Elsewhere it is slightly concave. Near the base the edges are slightly notched on the under side, apparently for holding a thong or cord for attachment. The edges of the object are somewhat sharp except below the notches. The base is cut square across. The perforation through the base is drilled from both sides; and a pit, where an attempt to drill was evidently made, may be seen below the perforation.

Fig. 13, *e*, shows an object, made of antler or bone, which is much decomposed. It may have been an arrow-point used by boys or for hunting birds.

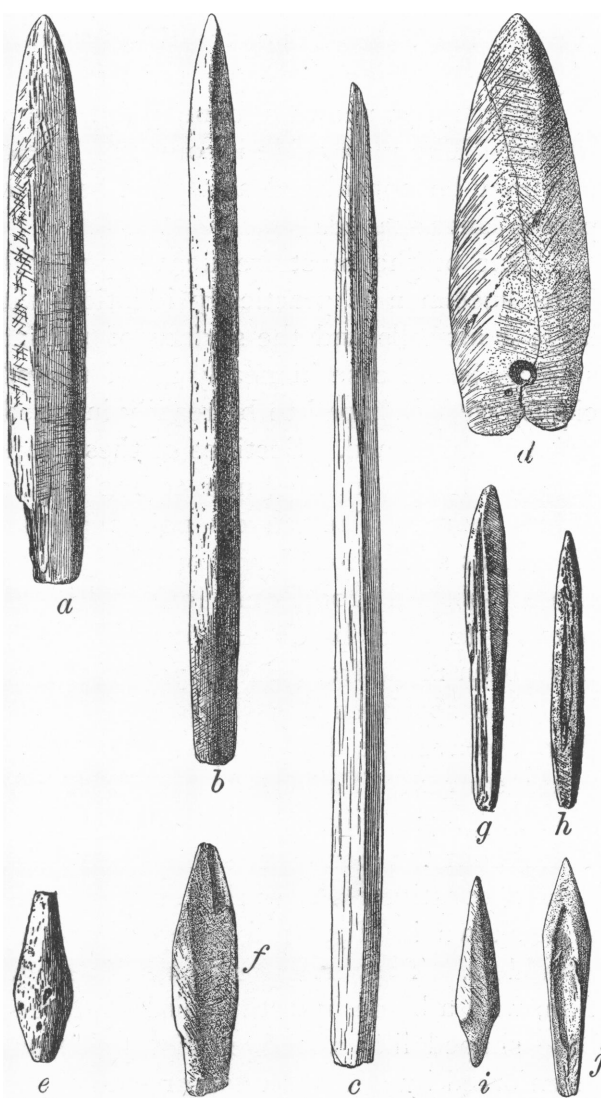


Fig. 13. Bone Points. $\frac{1}{2}$ nat. size.

a ($\frac{1}{2}$ nat. size), *b* ($\frac{1}{2}$ nat. size), *c* ($\frac{1}{2}$ nat. size), from main shell-heap at Eburne, collected by William Oliver; *d* ($\frac{1}{2}$ nat. size), from Shell-heap No. 1 at Port Hammond, found in shell material near Skeleton No. 12 ($\frac{1}{2}$ nat. size); *e* ($\frac{1}{2}$ nat. size), from Shell-heap No. 1 at Port Hammond, found 2 ft. below surface and 2 ft. above bottom of heap; *f* ($\frac{1}{2}$ nat. size), from main shell-heap at Port Hammond, Trench No. 2; *g* ($\frac{1}{2}$ nat. size), from main shell-heap at Eburne, found near Skeleton No. 62 ($\frac{1}{2}$ nat. size); *h* ($\frac{1}{2}$ nat. size), typical point from main shell-heap at Port Hammond, found near Skeleton No. 23 ($\frac{1}{2}$ nat. size) in Trench No. 2; *i* ($\frac{1}{2}$ nat. size), from Shell-heap No. 1 at Port Hammond, found 2 ft. deep, in same layer as Skeleton No. 5 ($\frac{1}{2}$ nat. size); *j* ($\frac{1}{2}$ nat. size), from Port Hammond, Trench No. 2.

The upper end is broken off. The fragment of the object is now plummet-shaped with all cross-sections circular.

Fig. 13, *f*, represents a bone point of oval cross-section for an arrow or spear. The lower fifth of the object forms the tang, which is nearly rectangular in section, with the right upper and left lower edges bevelled off.

Fig. 13, *g*, shows a bone point, the wedge-shaped tip of which is cut off square. The under side is convex. The object is smooth from wear. Its lower half may be considered as a tang, being more oval in section, while the upper part is lance-shaped.

One of the most frequent types of bone points is illustrated in Fig. 13, *h*. This specimen is practically identical with those found at Kamloops.¹ The large bone-cells and the surface of the marrow-canal show in the middle of one side, as is the case in nearly all of the points of this style. The base is sufficiently wedge-shaped to be readily inserted in the end of an arrow-shaft, and the point is sharpened. Sections of these objects are lenticular and oval. This type varies in length from 38 mm. to 200 mm., and to it belong over half of the bone points found. The narrow points previously described may perhaps be considered as specialized forms of this type. One of the specimens of this type has three V-shaped grooves cut in its edge. These seem to be the beginnings of notches to form barbs, and it would seem that many of the barbed bone points have been made from simple points of this form.

One specimen has sharp edges around its leaf-shaped base, which is wider than the average and wedge-shaped, but with one surface almost flat and the other convex. The whole specimen resembles somewhat the one shown in Vol. II, p. 410, Fig. 336, *f*.

About ten per cent of the bone points, although varying perhaps in minor details, constitute a class that suggests the form of the rubbed stone points of the style shown in Fig. 11, *b*, except that they lack the barbs or have only simple shoulders. They average 50 mm. in length, are flat or at least lenticular in section, with a blade from two-thirds to three-fourths the length of the object, and a base shaped like a wedge (Fig. 13, *i*) or truncated wedge, or with such a base re-enforced by a long scallop or notch on each side.

There are a few points in which the base is shaped like a wedge or truncated wedge (Fig. 13, *j*), and extends from two-thirds to three-fourths of the length of the object. The edges and sides then begin to converge toward the point, in some cases with convex and in others with nearly straight surfaces; the whole object being fusiform, with the longest end truncated. A specimen found at Eburne belongs to this class. Its base is squared off, and part of the rectangular wedge-shaped tang is shaved off near the middle. The tang extends about one-half the length of the point, where it merges into an oval head slightly thicker through the centre than the tang, but somewhat thinner at its point and edges. The edges are not sharp, but rounded.

¹ See Vol. II, p. 410, Fig. 336, *a*, *b*.

Another point suggests the one shown in Fig. 13, *c*, but it is only 63 mm. long. The base and point are wedge-shaped, but the latter is cut off from the edges so as to form a point. The portion of the wedge edge which remains is at right angles to that of the base.

There are some sharp bone objects which may possibly have been used as points for arrows or spears, but which seem more likely to have been used as teeth for fish-rakes or as barbs for fish-hooks, or even as awls, as implements for basket-plaiting, or for nose-ornaments. One of these, 46 mm. long, is sharp at both ends; but one end is blunter, and is more nearly wedge-shaped, than the other. The object is not well finished. It would have served admirably for a fish-rake tooth. It was found in the muck of the original surface-soil, four feet deep, and under Shell-mound No. 1, Port Hammond. The natives of the region use such objects, made of bone or iron, as teeth in fish-rakes and as barbs on halibut-hooks.¹

The specimen shown in Fig. 14, *a*, was found in the same place. It is sharp at both ends, but the point is more acute than the base. The striations at the point are nearly obliterated from wear, and the shaft is very highly polished. The object is oval in section except at the point, where it is somewhat irregular, owing to the rounded angles between surfaces, caused by sharpening it on a flat gritstone. Another specimen, similar in shape but more symmetrical, is shown in Fig. 14, *b*. There is little difference in the acuteness of the point and base of this specimen, and all striations have been obliterated by polish or wear. Both specimens seem much too long for fish-rake teeth, and the latter at least a third too long for the barb to a halibut-hook. They may have been used as spear-points, but their form is not sufficiently specialized to explain their use satisfactorily.

Fig. 14, *c*, represents a bone object a large part of the under side of which shows the natural outer surface of the bone. On the upper side the marrow-canal and large bone-cells show for about a third of its length near the point, while the lower two-thirds is made up of two surfaces, giving the implement a triangular section. A third of the way from the base are three rubbed notches, one in each edge. They probably served to hold cords used in binding the point or barb to its handle or hook; yet no sign of wear is to be seen on them. If fastened tightly, there would, of course, be very slight wear. The base is sharp, like the point. Base, point, and the other high parts of the object, are polished as if from wear. It may have been an arrow or spear point, but it seems more likely to be the barb of a fish-hook.

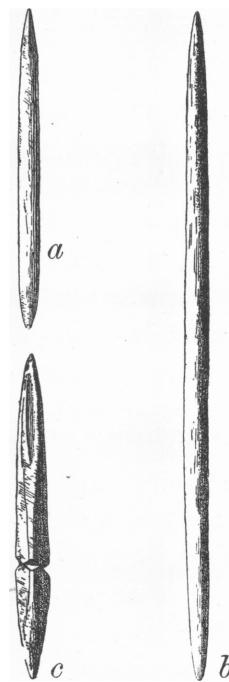


Fig. 14, *a* (3888), *b* (3889), *c* (3890). Bone Barbs, Points, or Awls. From Shell-heap No. 1 at Port Hammond; found in original surface-soil, 4 ft. below top. $\frac{1}{2}$ nat. size.

¹ See James G. Swan, The Indians of Cape Flattery (Smithsonian Contributions to Knowledge, Vol. XVI, Figs. 6 and 21).

There are several other specimens practically of the same size, and of this general form except that the middle notch is not present. One, which also shows the marrow-canal, lacks the notch on the upper side; but (as in the specimen shown in Fig. 14, *c*) one notch, in this case the right one, is higher on the shank than the other. Another is quite oval in section, tapers evenly on the sides, and the base is wedge-shaped. It is notched on the edges, one notch being opposite the other; and it may be an arrow-point, but, if so, would only admit of the insertion of a very small arrow-shaft between the notches. The objects shown in Figs. 33 *a*, 35 *c*, 38, and 49, might also be considered as belonging to this general class of bone points for arrows and spears.

A bone object practically identical with the one from the Thompson River region¹ was found in Trench No. 2 at Port Hammond. It is quite evenly decomposed, but the acute end has a wedge shape, which suggests that this end of the object may have been inserted in a split piece of wood. Another specimen was found in the muck of the original surface-soil, four feet below the surface of Shell-heap No. 1 at Port Hammond. It is evenly decomposed, and the animal material of the bone has entirely disappeared. The convex edge is sharp instead of rounded. Possibly two pieces like these were placed one on each side of a point, and lashed there with windings to form a detachable point² such as is used on the well-known salmon-harpoon, which is more common on the coast than in the Thompson River region.

One short bone point (Cat. No. $\frac{16}{88}$) was found in the shell-layer two feet two inches thick, the top of which was seven feet six inches below the surface of the main shell-heap at Eburne. It is slightly flattened at the base, which is cut off diagonally, suggesting that the object had been set in a prong of a fish-spear and used as a barb like that now employed on the three-pronged fish-spear of the Thompson River region. The specimens just described may have served the same purpose.³



Fig. 15 ($\frac{38}{88}$). Bone Barb. Length, 58 mm.

Fig. 15 illustrates a bone object found in the muck of the original surface-soil, four feet below the surface of Shell-heap No. 1 at Port Hammond. It is 58 mm. long and triangular in section. The top is cut square across, and the edge is almost sharp. The back, shown at the right in the figure, is of the outer part of the bone. It is ground to a point at its lower end. The lower part of the left side presents a flat surface, except that it is hollowed out in its upper portion. The groove thus formed ends at a small division, above which the inner face is bevelled off. If two such objects were placed one on each side of a flat slate point, this cut-out part would allow for the point, the small level spaces below the point would touch, and windings at that place would hold the three pieces in place. The two opposite grooves coming together would furnish a socket to receive the

¹ See Vol. II, p. 410, Fig. 336, *f*.

² Ibid., p. 251; and James G. Swan, *Indians of Cape Flattery* (Smithsonian Contributions to Knowledge, Vol. XVI, Fig. 4).

³ See Vol. II, p. 252, Fig. 232.

harpoon-shaft; and the triangular barbs would flare, one on each side. Another specimen slightly smaller was two feet deep, and in the same shell-heap layer in which skeleton No. 5 (Cat. No. $\frac{99}{1889}$) was found. It is essentially the same, except that the back is rounded. The division between the groove and the place for the point is very slight; and the upper end, instead of being sliced squarely off, so as to fit a flat object, is grooved to receive a cylindrical or oval tang or point, possibly similar to some of those of bone previously described. These objects are clearly barbs for such harpoon-heads as are at present used by the natives for taking salmon.¹

Bone points with barbs on one side only, most of which were probably used as arrow or spear heads, are shown in Figs. 16-18, 50, 52. The most typical of the simple forms with a varying number of barbs are shown in Fig. 17, *a, b, f, g, h, j*. Some interesting variations of this form are shown in Fig. 17, *c, d, e, i, k, l, m, n*; while Fig. 18 illustrates forms differing but slightly, except in the possession of guards, some of which are perforated.

The smaller points might well have served as arrow-heads, as prongs for bird-spears with several points,² or even for spears for fish or larger animals; while the large points, especially those with guards having a perforation (apparently for fastening a thong), were probably for harpooning large sea-animals, such as seals, etc. They are about as numerous as the chipped stone points, but not so abundant as the simple bone points. They are found in about equal numbers at Port Hammond and Eburne.

In Fig. 16, *a*, is represented a bone point which is sharp at both ends and of triangular cross-section. The notches forming the barbs, eleven in number, are merely grooves cut straight across the most acute edge of the object. The lower edge of each notch is rounded off to meet the sharp edge of the next succeeding groove. The surface of this object is much disintegrated.

Fig. 16, *b*, shows a bone point which is sharp at both ends. In section it is oval in places; near the middle it is plano-convex. Three barbs on the sharp edge, about equal distances apart, are formed by two grooves ground diagonally upward from each side below the barb.

Fig. 16, *c*, represents a bone point whose tip is missing. The base, which is nearly cylindrical, shows where it was notched around, and then broken nearly square across. In cross-section the shaft is square, with corners much rounded. A small ridge set out from the shaft by longitudinal grooving on each side shows at the left. This is notched practically to its base, and squarely across its edge, at

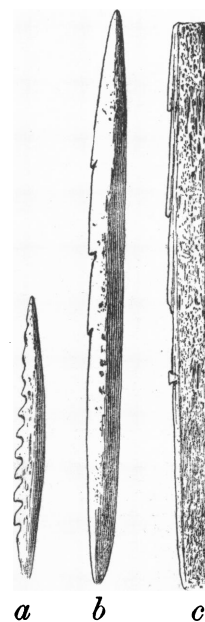


Fig. 16. Bone Harpoon-points. $\frac{1}{2}$ nat. size.

a ($\frac{1182}{1889}$), from main shell-heap at Port Hammond, Trench No. 5; *b* ($\frac{1192}{1889}$), from Shell-heap No. 1 at Port Hammond, found 2 ft. deep; *c* ($\frac{1192}{1889}$), from main shell-heap at Eburne.

¹ See Vol. II, p. 251; also James G. Swan, *Indians of Cape Flattery*, p. 20, Fig. 4.

² See Swan, l. c., p. 48, Fig. 34.

nearly equal intervals. The notches are undercut about 45° . Three of these show in the illustration. Below the third notch the ridge is cut away, except where a portion 3 mm. long is left, and is undercut, both above and below, in a similar way as the barbs. It may have facilitated fastening the point to a handle.

Fig. 17, *a*, illustrates a bone point of typical shape, with one barb. The shaft is cylindrical, but tapers towards the ends to a sharp point above, and to a small

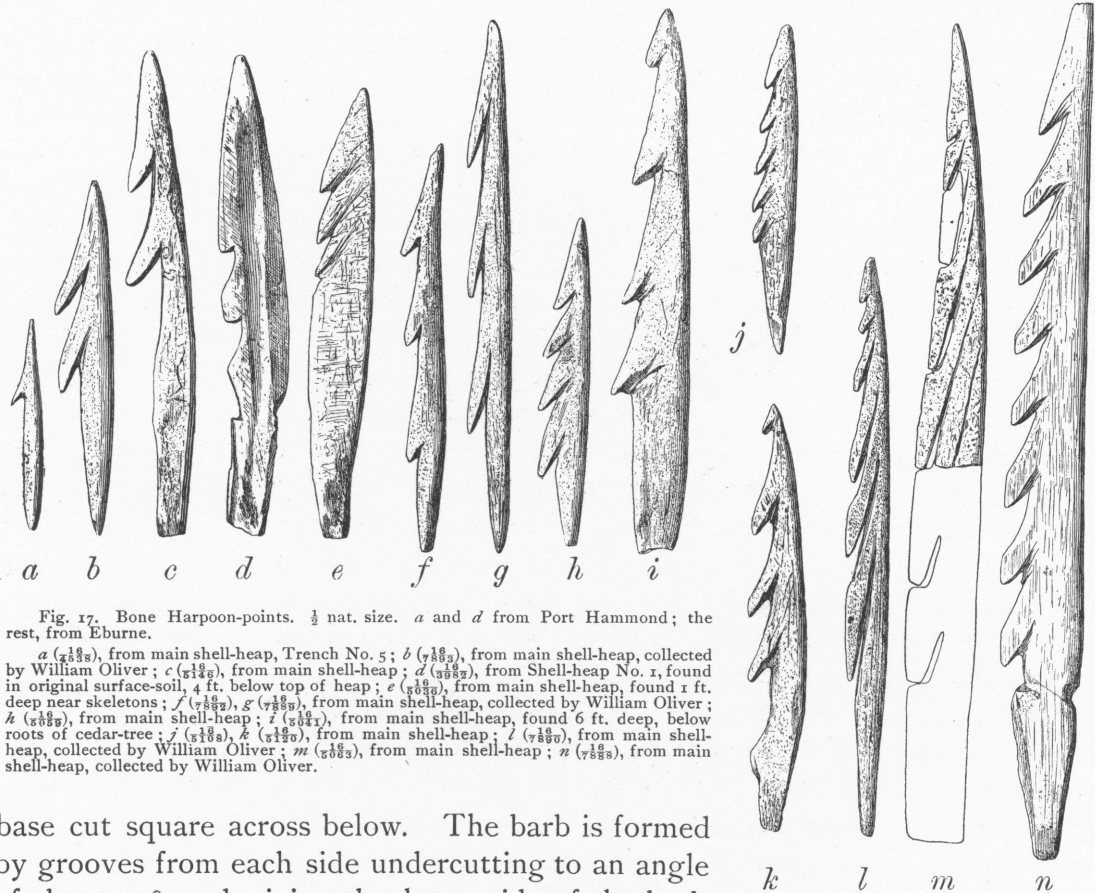


Fig. 17. Bone Harpoon-points. $\frac{1}{2}$ nat. size. *a* and *d* from Port Hammond; the rest, from Eburne.

a (7888), from main shell-heap, Trench No. 5; *b* (7889), from main shell-heap, collected by William Oliver; *c* (7890), from main shell-heap; *d* (7891), from Shell-heap No. 1, found in original surface-soil, 4 ft. below top of heap; *e* (7892), from main shell-heap, found 1 ft. deep near skeletons; *f* (7893), *g* (7894), from main shell-heap, collected by William Oliver; *h* (7895), from main shell-heap; *i* (7896), from main shell-heap, found 6 ft. deep, below roots of cedar-tree; *j* (7897), *k* (7898), from main shell-heap; *l* (7899), from main shell-heap, collected by William Oliver; *m* (7900), from main shell-heap; *n* (7901), from main shell-heap, collected by William Oliver.

base cut square across below. The barb is formed by grooves from each side undercutting to an angle of about 45° , and giving the lower side of the barb two concave surfaces either side of a sharp edge. The upper side of the barb is rounded.

Fig. 17, *c*, represents a bone point with two barbs, which varies from the style shown in Fig. 17, *a* and *b*, in that the shaft has a somewhat square section. It curves so that the back is convex. On the middle third of the part below the barbs is a raised and more rounded or bulging part, which was perhaps intended to facilitate hafting by holding lashings from above and below it. If its back were placed against the shaft, diagonal cross-lashings would hold it firmly in place. The base is irregular, as if broken or whittled across, and this end of the shaft is whittled in such a way as to be slightly larger than the part immediately above it. The barbed side and the bulge are by far the smoothest portions; while the sides and base, except at the bulge, do not seem to be worn.

Fig. 17, *d*, illustrates a bone point with two barbs, which varies considerably from the type heretofore described. It is flat, with a large lanceolate tip.

The point shown in Fig. 17, *e*, is made of a flat piece cut out of some very large bone, possibly of the whale. The upper part is about 4 mm. thick; the base, about 6 mm. The edges are square, with slightly rounded corners, and the barbs are cut from both sides. The notches are scratched in, and the scratches extend over the sides of the point.

Fig. 17, *f*, shows a bone point with three barbs, but otherwise similar in shape to the type illustrated in *a* and *b*. The tip is broken off, and the object may have originally had four barbs.

Fig. 17, *g*, represents a bone point with barbs less divergent from the axis than those previously described; *i*, one of rather flat cross-section, with short slender barbs, the terminal one being very near the tip (cf. *k*). In *j* we find a somewhat flat point with small barbs; in *k*, one similar to *c*, but with terminal barb very near the point, and the tops of all the barbs made up of two surfaces. Its cross-section is rounded, but its base has square corners. The purpose of the basal projection on the barbed side is not quite clear. The point shown in *l* has evidently been cut from a long smooth bone point, the barbs being formed by long narrow grooves that widen downward and form notches. These grooves are so narrow, so nearly parallel with the axis, and so far apart, that considerable portions of the original edge of the point are left standing.

Fig. 17, *m*, illustrates a broken point quite similar to the last, but very flat, wedge-shaped in cross-section, with one open terminal barb, while all the others are almost purely ornamental. The tip of each barb touches the upper side of the next lower one, while the grooves that separate them are cut through nearer the axis, and thus form eyelets. The reverse of the specimen does not show the grooves projecting beyond the eyelets, but this may be due to its greater disintegration.

Fig. 17, *n*, shows a bone point with sharp barbed edge, convex sides, and wide flat back. The tips of the barbs show short portions of the original edge from which the barbs were cut. As in most cases, the lower surfaces of the barbs are cut in from both sides; while the upper surfaces, with the exception of that of the barb nearest the tip, are cut square across. The base is roughly pyramidal with truncated end. It is set off from the shaft by a notch on the back, and one on the front.

In general, barbs of cylindrical points are cut on their lower surfaces from each side of the shaft; those of flat or somewhat square points are generally cut square across. The bases of round points have a tendency to be conical, those of points with square backs are usually rectangular, in cross-section. There is an imperceptible transition from points with barbs cut into the general outline, as shown in Fig. 17, *k*, *l*, *m*, and *n*, to those having barbs projecting beyond the general outline of the object, as in Fig. 17, *a*, *b*, and *g*.

Harpoon-points of bone, with barbs on one side, and with guards for the

attachment of lines, are shown in Fig. 18. The first and the second specimens (*a*, *b*) are quite flat; while the third one has a rounded shank, which influences the shape of the barb. In this last the barb is cut out from each side, while the barbs of the first and second specimens are cut square across. The barb projects from the line of the shaft, and is not made by a notch indenting the shaft, as is the case with all the points of this style heretofore described. This is apparently true of all typical points, while all special points are notched into the general outline.

The attachment for the harpoon-line is either a bar near the base or a semi-

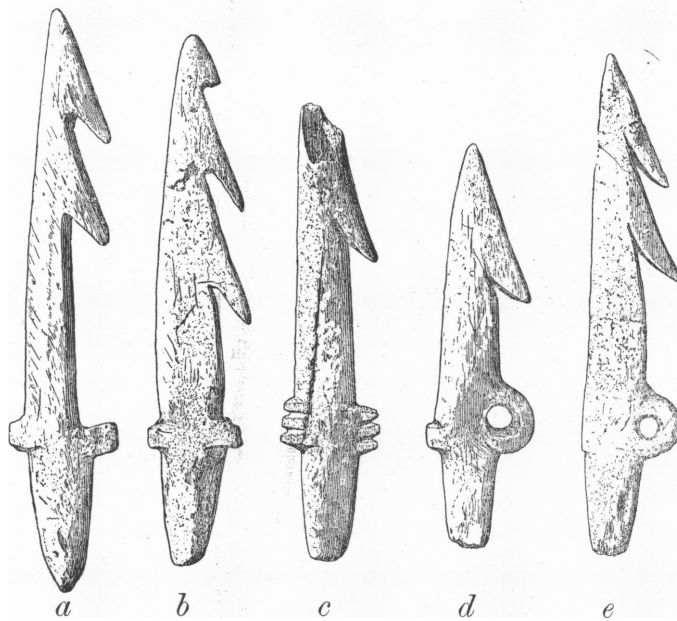


Fig. 18. Bone Harpoon-points with Guards. From main shell-heap at Eburne. $\frac{1}{2}$ nat. size.
a (x1882); *b* (x1883); *c* (x1884), found 2 ft. deep in black soil resting on shell material, beside skull of Skeleton No. 72 (x1887); *d* (x1888); *e* (x1889).

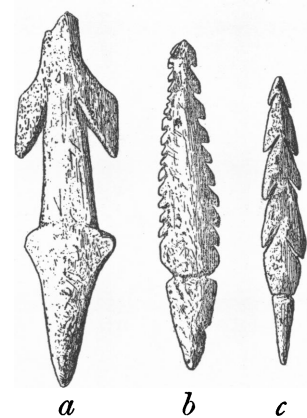


Fig. 19. Bone Points. Port Hammond. $\frac{1}{2}$ nat. size.
a (x1890), from Shell-heap No. 1, found 1 ft. above original surface-soil in same layer as Skeleton No. 7 (x1891); *b* (x1892), from main shell-heap, Trench No. 4; *c* (x1893), from main shell-heap, Trench No. 2, 2 feet deep.

circular bulge with a perforation gouged through from both sides. The bars consist of projections left standing on the barbed side and on the back. One of these bars (Fig. 18, *c*) is grooved, evidently to give firmer hold to the line. In *d*, both the perforation on the barbed side and a projection on the back may be seen. It seems possible that the perforation may have been for the attachment of feathers. Some of the harpoon-points were decorated by etchings (see Figs. 50, 52).

Bone points barbed on both sides are shown in Fig. 19. The first of these is similar in character to the large harpoon shown in Fig. 17, *n*. Its tip is broken off. The tips of the barbs show proportionately longer sections of the original edges from which they are cut than do those shown in Fig. 17, *n*. The shaft is slightly rounded, the lower end of the base is conical.

In Fig. 19, *b*, is represented a broken specimen of a bone point, which is made of a section of bone cut off in such a way that the marrow-canal extends

diagonally across it in the middle of the under side, which is somewhat bevelled off from the canal to the edges. The diagonal direction of the canal, and the resulting bevelling of the narrower part between the canal and the edge more than the wider part, give the point of the object something of a downward twist on the right. The edges are thin, while the middle is the full thickness of the bone, giving the object a somewhat triangular section. It is not symmetrical, there being sixteen barbs on the left edge, and only nine on the right. They are formed by notching the edges of the object at short intervals with triangular grooves, which run out slightly on the sides of the object, and give the lower side of the barbs a rounding surface rather than the two usual surfaces with an intermediate angle. The tip is broken off, but the broken surface has since become worn. The base is pointed. It is separated from the main shaft by a notch extending nearly all round it.

Fig. 19, *c*, illustrates a bone point which has four pairs of barbs. The specimen is oval in section except across the points of the barbs, where it is lenticular, and across the tang, where it is somewhat rectangular. This specimen is the only one in which the edges of the object were given a wavy shape before the barbs were cut. The waves are larger as they approach the base. The notches were cut in below the crest of each wave. Thus the general outline was indented in such a way as to increase the depth of the notches, but this did not reduce the length of the barbs. The tang, which is nearly rectangular in section and tapers to a blunt point, is of nearly equal thickness throughout. It is marked off from the point by an incision extending around it.

None of the barbed points resemble the bone harpoon-points found in the Thompson River region.¹ The specimen shown in Fig. 33, *a*, may be a point in process of manufacture rather than a completed implement.

Arrow-shafts, foreshafts, spear-handles, or bows were not found. Some pieces of red cedar about 100 mm. long, flat on one side, rounded on the other, and with one side stained by copper salts and speckled with small fragments of corroded copper, may have been parts of such implements. These pieces were all found in the main shell-heap at Eburne. Some of them were found at a depth of one foot; others at a depth of three feet, and with a skeleton; and still others at a depth of two feet, also with a skeleton. One of these had bevelled edges, another had one end square and the other in the shape of half of an ellipse.

The following series of implements were probably used for fishing.² Fig. 20 represents a thin bone object which was found in fragments. It is made of a large piece of bone, probably that of the whale. Its upper part is spoon-shaped with irregular bowl. The base forms a tang, which tapers slightly to a rude wedge-shaped point. At the tip is a somewhat irregular hole, about 3 mm. in diameter, gouged out from both sides. Two smooth tapering holes drilled from the upper surface are found, one on each side. The upper side near these holes is shaved off smooth, so that the edge of the spoon at this place becomes some-

¹ See Vol. II, p. 137, Fig. 20; and p. 410, Fig. 337.

² See also p. 168, Fig. 32.

what sharp, while elsewhere it is rounded. On the under side there are transverse incised marks from 3 mm. to 5 mm. in length, one on each side of the lateral holes. The form of the object is similar to that of the blades of buoyant fish-decoys, which are placed on the end of a long spear and thrust down into the water. The spear is quickly pulled up, and the decoy rises with a rotary motion produced by the blades. As the fish are attracted by the decoy, they come within reach of the fish-spear.¹ This implement, however, seems too large and too heavy for a blade of this kind, and no perforations are required on such blades.

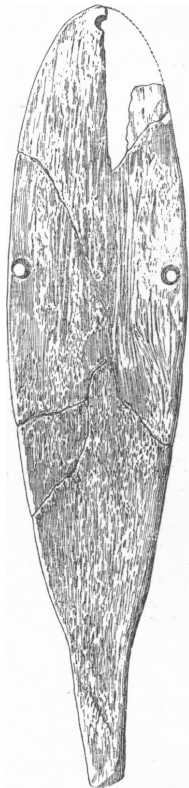


Fig. 20 ($\frac{1}{100}$). Bone Object. From main shell-heap at Eburne. Length, 202 mm.

Fig. 21 shows an object made of gray schistose rock, probably mica schist. It is rudely plummet-shaped, and seems to be simply a fragment of a boulder, formed on the under side by the natural curved surface, on the upper side by two natural cleavages at right angles to each other. These two surfaces are somewhat weathered. Two grooves are cut near the top. They may have served for attaching cords. The specimen was found in the main shell-heap at Eburne, near Skeleton No. 26 (Cat. No. $\frac{99}{1772}$).²

The perforated and pecked stones shown in Fig. 22 were probably fish-net sinkers, and weights for setting lines. The first of these is a natural pebble of gray granular trap, perforated at its upper flat end. The perforation is made as usual, and tapers from each side towards the centre. The pits are about 40 mm. in diameter at the surface. They round in and downward at first, and then taper to 15 mm. in diameter at the narrowest part of the perforation. It seems probable that the perforation was made by pecking, and was perhaps smoothed by drilling or grinding with some large



Fig. 21 ($\frac{1}{100}$). Stone Object resembling a Sinkers. Length, 112 mm.

stone. The object is somewhat battered, especially at the base, as one might expect if it had been used as a net-sinker or as a weight for a set line. Mrs. Weber has in her collection two specimens found at the same place as this, and somewhat similar to those shown in Fig. 22, *a* and *b*.

Fig. 22, *b*, shows an implement made of a flat pebble of volcanic ash, battered on the edge in places, as is the typical pitted hammerstone of the Mississippi Valley, and perhaps slightly smoothed on most parts of the sides, but in the main retaining its original form. The central perforation rounds in and downward more than that of the previously described specimen, but is still similar in general shape, and probably in method of manufacture.

Fig. 22, *c*, *d*, represents two pebbles, the former of purplish brown quartzite,

¹ See Swan, *Indians of Cape Flattery*, p. 42, Fig. 24.

² See p. 168, Fig. 32.

the latter of white quartzite. In the middle of both the upper and under sides of the upper end of these objects is a pecked pit, which indicates that a perforation was started. The smaller object has similar pits on its lower end. Otherwise the pebbles present natural surfaces.

In the main shell-heap at Eburne a somewhat flat, oval pebble was found. A flake was removed from the middle of the two narrow edges, and the flaked portions were battered; so that they form shallow notches that may have facilitated tying the pebble to a net or other fishing-utensils needing a sinker. It is

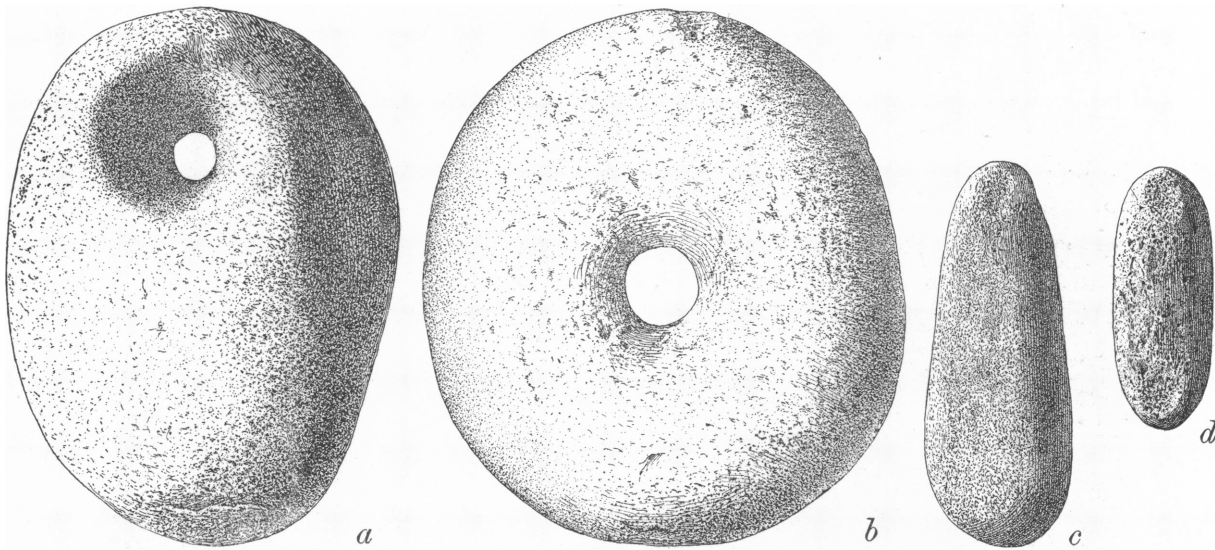


Fig. 22. Perforated Stones, and Stones showing Pecked Pits. *a* and *b* from Port Hammond; *c* and *d* from Eburne. $\frac{1}{2}$ nat. size.
a ($\frac{1}{2}\frac{1}{2}\frac{1}{2}$), found on surface of main shell-heap; *b* ($\frac{1}{2}\frac{1}{2}\frac{1}{2}$), found on surface of main shell-heap, collected by James M. Dale; *c* ($\frac{1}{2}\frac{1}{2}\frac{1}{2}$), *d* ($\frac{1}{2}\frac{1}{2}\frac{1}{2}$), from main shell-heap.

also slightly battered near both ends of one edge, which suggests that it may have been used as a hammer (see p. 163).

Tubular bones, pieces of which had been cut off by incising all around and then breaking, occur at Eburne and Port Hammond. A bird-bone of this description was found at Eburne, and the long bone of a young mammal (Cat. No. $\frac{1}{4}\frac{1}{4}\frac{1}{4}$) at Port Hammond. A fragment of a bone tube 19 mm. in diameter, with one end cut off and smoothed, was also found at Port Hammond. It was made from a long bone of a mammal. Tubes or rings may have been cut off from these pieces, and used as beads or as eyelets for strings,¹ such as the present native uses on his fish-nets. Two such tubes, 63 mm. and 96 mm. long, were found by us. A third one, 98 mm. long, was collected by Mr. Oliver from the main shell-heap at Eburne. It is made of the radius of a bird. One end is whittled, and consequently it tapers slightly. These may have been used as calls in hunting or as drinking-tubes.²

No specimens used for collecting vegetable foods were found, although it seems probable that root-diggers and baskets must have been in use. The speci-

¹ See pp. 166, 180; also Vol. II, p. 250.

² See Vol. II, p. 154, Fig. 102; p. 313, Figs. 283, 284; and pp. 412, 428.

men illustrated in Fig. 59 may have been the handle of a root-digger. Scrapers, which are so frequent in the interior, were not found, but some of the spatulate bone objects here described may have been used for this purpose.

Stone pestles or hammers, that serve as wood-workers' tools and are also used for crushing dried meat, berries, etc., were not rare. Fragments of twenty specimens were found, — eleven at Port Hammond, and nine at Eburne. Pestles consisting of natural pebbles of suitable form, such as were used in the interior,¹ were not found. The hammers were made by pecking or grinding, and usually have a polish that was applied purposely or by handling.

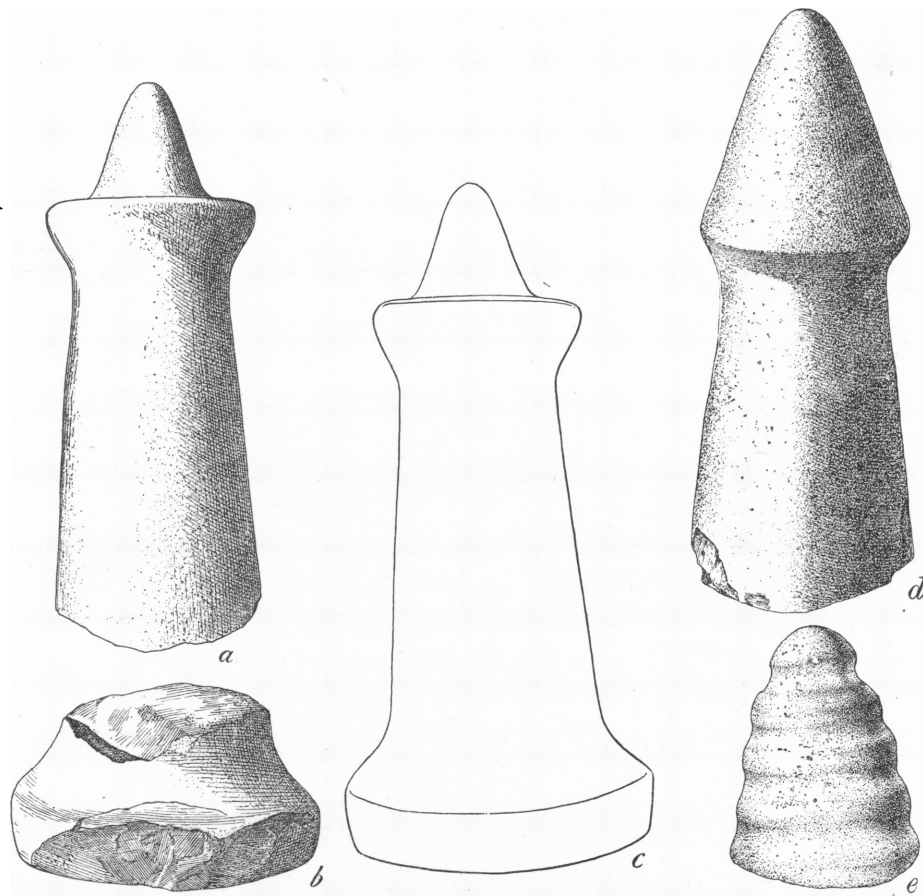


Fig. 23. Fragments of Stone Hammers or Pestles. $\frac{1}{2}$ nat. size.

a ($x\frac{1}{2}\frac{1}{2}$), from main shell-heap at Port Hammond, found with wedge of antler, 4 ft. deep in Trench No. 2; *b* ($x\frac{1}{2}\frac{1}{2}$), from main shell-heap at Port Hammond, on surface; *c*, form of the typical stone hammer or pestle of the shell-heaps of the Lower Fraser, reconstructed from specimens shown in Fig. 23, *a*, *b*; *d* ($x\frac{1}{2}\frac{1}{2}$), from main shell-heap at Eburne; *e* ($x\frac{1}{2}\frac{1}{2}$), from main shell-heap at Eburne, collected by William Oliver.

At Port Hammond the shafts or bodies are all nearly cylindrical, tapering only slightly from base to top. Eight out of the eleven fragments show the form of the top; and seven of these — all being broken and chipped except the one shown in Fig. 23, *a* — were of the same general type. The tops are in general hat-shaped. The shaft flares out, and forms a nearly flat top surmounted by a

¹ See Vol. II, p. 138, Figs. 30, 31.

conical nipple. The hat-shaped tops of the Thompson River region¹ differ from this type in having rounder forms of the flaring rim, and in having, in place of the conical nipple merging into a nearly flat surface, a dome-shaped nipple reaching almost to the flaring rim. The broken end of the specimen here illustrated is battered as if the object had been used after it was broken. It was found with a wedge made of antler. Another specimen, the most nearly complete of all, is battered and broken at both top and striking-head. The latter is cylindrical, about 15 mm. high, and larger than the body, which flares out to meet it. The striking-face is convex. Two of the seven specimens had more bulging ends, or the curve from the nipple to the edge was more nearly symmetrical with the flare from the shaft to the same point. One of these had been used after being broken, the fractured end being battered. A conoid nipple with top slightly squared, which had been broken from the top of a pestle, is among the seven typical specimens of tops from Port Hammond. Only one specimen was found without the nipple. This top resembles in shape those of the hammers from the northern part of Vancouver Island,² although it is much smaller. Possibly the nipple may have been broken off and the top then given its present shape. Two disk-shaped fragments which were found might be either striking-heads or flat tops of the kind just mentioned. It seems more likely that they were striking-heads, since we should expect to find approximately equal numbers of both ends of pestles, while actually the conical ends were more numerous than the flat ends, so that it is unlikely that many of the flat ends were tops. The fact that all but one of the tops have conical ends, also makes it more probable that the fragments with flat ends were striking-heads.

The face of one of these striking-heads was convex ; that of the other, concave. The heads were both about 15 mm. high, one with rounded edges much fractured, the other with edges more nearly square. The broken upper end of this latter specimen (Fig. 23, *b*), was rubbed as if by friction with other tools. It had been in the fire, and was burned and crackled. This burning, however, may have been from a recent land-clearing fire, as the specimen was found on the surface.

Fig. 23, *c*, shows a reconstruction of the typical stone pestle or hammer of this region, made by combining the typical top with the typical striking-head.

Nine pestles were found at Eburne, all of which have almost cylindrical shafts slightly tapering toward the top. The tops of only four of these are preserved. Two of them, which were made of the same kind of greenish material, are much alike (Fig. 23, *d*).³ They lack the flat flange of the Port Hammond pestles. A similar type was found at Lytton,⁴ and it seems probable that these two specimens may have been importations. The third one had a hat-shaped top like those

¹ See Vol. II, p. 138, Figs. 23, 24, 27; and p. 413, Fig. 341, *b*; also *American Anthropologist*, 1899, Figs. 9, *b*, 10, *d*, *e*, *g*.

² See *American Anthropologist*, 1899, p. 365, Fig. 11, *b*, *c*.

³ *Ibid.*, Fig. 11, *a*.

⁴ See Vol. II, p. 138, Fig. 25.

found at Lytton. Besides these, a conical fragment was found which may have been the top of a hammer (Fig. 23, *e*).

Among six striking-heads that are preserved, five have the same shape as the typical ones from Port Hammond. Their faces are flat or concave. One of those with a concave face has a slight groove around the middle of the striking-head, as if for ornament. The last specimen has a striking-head about 50 mm. high, and resembles the heads of specimens found at Lytton. The object, however, is crude, and may not have been completed.

The fact that some specimens were concave on the striking-face shows that they were used to hammer such tools as wedges and chisels, which would wear out the central portion. Had they been simply employed for crushing food, the faces would have been convex.¹

Flat, oval boulders, varying in size from that of an ordinary hammerstone to about eight inches in diameter, were found in the main shell-heaps. Some of those from Port Hammond, being somewhat battered and rubbed, are thought to have been used as anvils or lapstones. None with a saucer-shaped depression in the centre of each side, such as were found in the Thompson River region, were seen.

Flat pieces of sandstone were found,² but not large enough to be considered as anvils upon which to crush food. Only one of the larger specimens is pitted. It has a shallow pit, about 5 mm. deep and 50 mm. in diameter, pecked in the

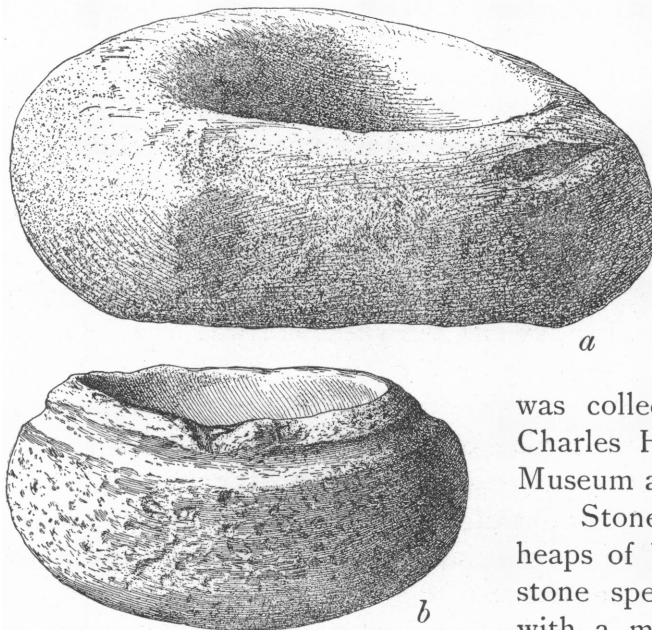


Fig. 24. Mortars. $\frac{1}{2}$ nat. size.
a ($\frac{1}{2}$ 1182), made of sandstone, from Port Hammond, collected by James M. Dale; *b* ($\frac{1}{2}$ 1187), made of lava, from main shell-heap at Eburne, found 3 ft. deep in black soil.

middle of one side. It may have been used as an anvil or lapstone. There are also flat slabs like whetstones (see p. 168), in which are shallow oval hollows. One specimen in the collection of Mrs. Ellen R. C. Weber is an oval slab with two parallel oval hollows. Another is flat and rough, with four shallow oblong hollows. It

was collected at Port Hammond by Mr. Charles Hill-Tout, and is in the Provincial Museum at Victoria (Cat. No. 619).

Stone mortars are found in the shell-heaps of both localities. One simple sandstone specimen (see Fig. 24, *a*), and one with a marginal groove around the bowl, were found at Port Hammond. The former is made of a sandstone slab, and is shaped

¹ One pestle was given to us by Mr. Mergutroid, who lives two miles from the main shell-heap at Port Hammond. He did not know its provenience. It resembles the Lytton type so much, that I presume it may have been found in that district, and therefore exclude it from consideration.

² See p. 167.

by pecking. In a few places the original surface of the slab still shows. The latter is apparently made of lava. It is about 150 mm. in diameter and 75 mm. thick. The lower edge of the groove merges into the surface of the mortar. The rim of the mortar is rounded. The specimen is in the collection of Mr. Reginald C. Brooke. A second specimen with a marginal groove was found at Eburne (Fig. 24, *b*). It does not show any marks of pecking. Four mortars artistically sculptured to represent animal forms were found in the shell-heap at Eburne (see Figs. 53 *a*, 54, *a*, *b*, 56). Sculptured mortars are also shown in Figs. 53 *b* and 55 *d*. Most of these mortars were evidently made of small boulders, and were shaped by pecking. They may have been used for grinding food, tobacco, or paint.

Fish-knives made of slate are very numerous in these shell-heaps. Their frequency is evidently due to the great use of the implement in preparing immense numbers of fish for drying. Twelve entire and eighty-four fragmentary specimens were found at Port Hammond, and one entire and seventy-four fragmentary specimens at Eburne. It seems peculiar that out of a hundred and seventy-one specimens, only thirteen should be found entire. The typical specimens are similar in form to those now used in this region. Most of these latter, however, are made of iron instead of slate, and many have bone or wooden handles. There are no traces of handles on the slate knives.

Fig. 25 shows a typical specimen. Its greatest thickness is only about 3 mm. The sides are ground smooth, and near the lower part they are bevelled off to a keen cutting-edge. The sides near the upper part are slightly bevelled off, but the edge itself is square across. This bevel is evidently intended to facilitate the insertion of the blade in a handle. The sides bevel towards the ends also, and these are squared across and slightly smoothed at the corners. Their lower edges are very sharp.

Another specimen of similar form, except that the bevel to the back blends imperceptibly into the surface of the sides, was also found in the same trench, at a depth of three feet. The average knife was smaller than these two, being about 100 mm. long and 50 mm. wide. The shape varies, many having a straight cutting-edge, the back and ends forming the arc of a circle. Others have long curved cutting-edges, the whole object being oval in outline. In still others the cutting-edge consists of straight lines meeting at an obtuse angle, which is

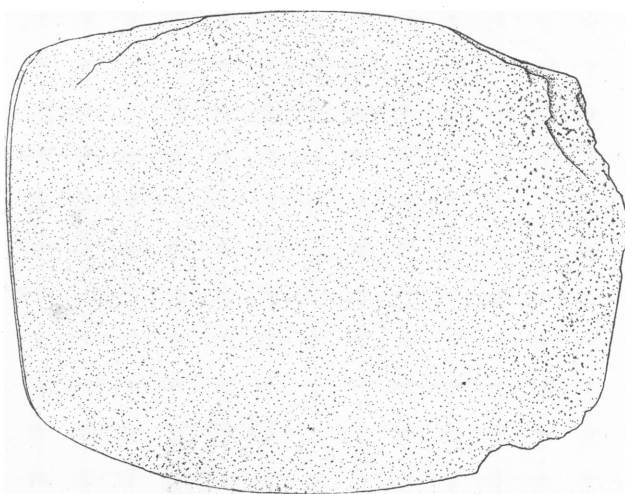


Fig. 25 ($\frac{1}{2}$ nat. size). Fish-knife made of Slate. From main shell-heap at Port Hammond, Trench No. 2; found 2 ft. deep. Length, 160 mm.

rounded off. The cutting-edge runs usually with the grain of the stone, but there are exceptions to this rule.

Some of the fish-knives show striations and scratches on the sides. In some cases there are no bevelled surfaces at the upper edge and at the ends, which are simply smoothed. Occasionally the bevel to the sharp lower edge is more or less abrupt. Sometimes only one surface is bevelled; in other specimens the bevel is on one side at one part of the specimen, and on the opposite side at another.

A few specimens were found which, although apparently of the same general shape as fish-knives, had two slightly convergent cutting-edges opposite each other. They were probably broken spear-points or daggers. One of these has in one of its surfaces a number of transverse grooves of irregular depth, but averaging about 1 mm. deep, running from one edge toward the axis. One piece found at Port Hammond is rectangular and sharpened at one side and at one end. Possibly it may have served as an adze (see p. 167).

Pieces of broken slate fish-knives were apparently used in the manufacture of points for arrows, spears, knives, etc. (see p. 144), as is testified by a fragment of a fish-knife from Eburne of the shape of an isosceles triangle, one side being the cutting-edge of the fish-knife, the other partly bevelled off from one side, but still showing traces of the break. This forms a serviceable point, even though the base is merely a broken edge. A piece of a fish-knife found seven feet deep in Trench No. 3 in the main shell-heap at Port Hammond shows a groove by means of which it was broken at right angles to the cutting-edge. Other pieces from both Port Hammond and Eburne, that are more or less of the form of points, are bevelled from both sides on two edges. Still other fragments have been grooved and broken straight along one or more edges so as to assume the general tapering triangular shape of slender points.

One piece ($\frac{16}{4214}$), about 70 mm. long and 28 mm. wide, has a smoothed back and a peculiar thin, sharp edge. This is made thin by a broad shallow groove about 8 mm. wide, one on each side of the edge, which is sharpened by the usual bevelling. The ends are broken and somewhat chipped on each side, which makes them thinner there. They could easily be sharpened by rubbing. The specimen was found in Trench No. 2, in the main shell-heap at Port Hammond.

A fragment of a slate fish-knife found at Eburne seems surf-worn on all surfaces, and may have been brought to the shell-heap from the beach, where it had lain long enough to become water-worn, as material from which to make some small object.

Two fragments from Eburne, each showing part of the cutting-edge of the knife on one of its edges, were nicked and flaked on another edge, so that they resemble saw-blades; and the higher parts of the teeth show signs of rubbing, which suggests that these pieces may have been used to crudely saw pieces of wood or bone. However, Indians living at the northern end of Vancouver Island, not far from this site, say that such saws were never used by their ancestors.

Several rib-bones found in these heaps may have been used as stirrers. Two

of them are polished from use. They resemble the stirrers used by the present Indians of this region.

Many cores of the horns of mountain-goats were found, one on the undisturbed surface under Shell-heap No. 1 at Port Hammond. Other bones of goats were comparatively rare, and it seems probable that the goat-horns may have been brought to the camp for the manufacture of horn objects, such as spoons and the like.

Food was probably cooked in the manner practised by the recent natives, by roasting before an open fire, baking, or steaming in a hole in the ground, and also by boiling with hot stones.¹ Roasting is suggested by some of the bones, which are burned. Pebbles, that may have been heated and dropped into the dish for boiling, were found on and in the shell-heaps. Many of these are soot-covered, burned, broken, and crackled, as though they had been heated and thrown into water. No pottery has been found in this region.

Wedges made of elk-antler were found in the shell-heaps at both Port Hammond and Eburne, — twenty-six in the former and forty-four in the latter. They are as numerous as chipped and ground stone points taken together. This certainly suggests the great usefulness of the wedge, the indispensable tool of the modern Indian in building houses, cutting firewood, and in wood-work of all kinds.² The wedges found in the shell-heaps are usually made from the basal part of an elk-antler; and about three-fourths of them are cut diagonally across, exposing the central cellular portion of the antler. Nearly all of these are cut off from one side. Only five are cut off symmetrically from both sides (Fig. 26). They resemble in all essential details those from Lytton.³ Many of them were made of curved pieces of antler. They look almost exactly like a specimen from Lytton,⁴ and cannot be mistaken for warped specimens. They are similar to the curved wedges of the canoe-builders of the Coast Indians. The wedges vary in size from large specimens 200 mm. long to small ones 85 mm. long. Many of the wedges are somewhat smoothed from use. Their upper ends are chipped and crushed, showing the effect of the stone hammer. A few wedges made from the tip of the antler were found. Most of these, although asymmetrical, were sharpened from both sides, giving them the form of small chisels. Similar specimens were found in the Thompson River region.⁵

One-half of a split wedge was found on the surface of the little shell-heap at Eburne. In this specimen a narrow longitudinal groove has been cut parallel to the break, as if the owner had intended to trim off the broken edge and make a narrow wedge or chisel from the broken implement.

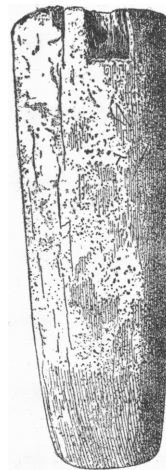


Fig. 26 ($\frac{1}{2}$ nat. size). Wedge made of Antler. From main shell-heap at Port Hammond, Trench No. 2, found $1\frac{1}{2}$ ft. deep. Length, 121 mm.

¹ See Swan, *Indians of Cape Flattery*, p. 25.

² See Vol. II, p. 183.

³ Vol. II, p. 141, Fig. 36; p. 414, Fig. 345.

⁴ Vol. II, p. 141, Fig. 37.

⁵ See Vol. II, p. 414.

At Eburne a wedge was found the head of which had been cut off at a bevel all around, so that the hammer-blow could fall only upon the central part, and would not split off the sides of the wedge. The heads of several specimens were made in a similar manner, but none were so marked as this one. Another specimen, a curved wedge from Eburne, has a groove around the body about 30 mm. below the top. The groove was made by striking downward with some sharp implement. It is about 2 mm. deep, 10–18 mm. wide, and irregular, in places merely a roughness. It may be that this was to hold a withe in place, as the modern natives fasten withes around the tops of their wooden wedges to keep them from splitting.

In some of the broad wedges part of the point was removed before they were made into the wedge shape. Thirty-six such natural tips cut from antlers, and not artificially shaped, were found, eleven of them at Port Hammond (see p. 173).

Eleven bone chisels have been found in the main shell-heap at Eburne, and five in the main shell-heap at Port Hammond. Of those from Eburne, seven have the upper ends battered and slivered. The upper ends of the other four are broken off. Six have the chisel-edges in a plane parallel to the natural surface of the bone. One of these is one end of a whole bone, the middle of which was bevelled off to form the chisel-edge. The other five specimens are made of longitudinal segments of bones cut out by grooves. The tops of two of these are broken. One of the specimens is dulled, rounded, and polished on the cutting-end, as if it had been used as a punch. One has three parallel grooves along one of the longitudinal cuts, but scarcely of a character suggesting a property-mark. Three of the specimens from Port Hammond are of this style, all battered at the top. Otherwise one suggests the blade of a dagger (see p. 174), another has a notch on each edge near the upper end. Three specimens have the chisel-edges at right angles to the natural surface of the bone, and they are made of longitudinal segments. The tops of two of them are broken off. One of those from Port Hammond has this sort of an edge and a battered top, but is made from a fragment of bone split off rather than cut off by longitudinal grooves. The fifth specimen from Port Hammond is broken from the splint end of an ulna, and is sharpened from each edge to a chisel-blade at right angles to the plane of its widest surface. Two specimens are each made of the proximal part of an ulna,—one of the deer, the other of the elk. These resemble the awls with chisel-like edges (see p. 171), except that the projection on one edge of the bone near the top of each has been cut smoothly off. The tops are cut squarely across, and have been battered. The large bone sharpened at one end, and described as a skin-scraper (see Fig. 34, *b*) may be such a chisel rather than a skin-scraper.

The deeply pitted hammerstones common to the eastern United States were not found in this locality, unless we may consider a solitary specimen, the one shown in Fig. 27, as such. This specimen, however, is not battered around the

edge, as would have been the case if it had been used as a hammer. The specimen is an oval pebble, evidently of diorite. The surface seems to have been smoothed as if by rubbing, but feels gritty to the touch. There is a battered oval pit about 30 mm. long in the middle of each of the two flattest sides. The object may have been used as an anvil upon which to pound, or as a hand-hammer, the pits being the parts with which the blow was delivered.

Hammers or mauls (except the doubtful one mentioned on p. 155), that probably had been hafted in some way and used on one or both ends, were not seen, nor was there found any pebble with a groove of any sort around it, nor with anything that might have served as a place around which to fasten a withe handle. It seems worth mentioning that at the present time hafted hammers are not used by the Indians in this area.

The oval stone disk shown in Fig. 28 seems to have been made from a flat oval pebble, probably of diorite. It is battered around the edge, which suggests that it may have been used as a hammer. Each side is flat, but the remainder of its surface seems to be that of the natural pebble. Its entire surface seems smoothed by wear, since it was battered. Possibly the object was used as a stone hammer or pestle, these flat parts being striking-faces, and the battered edges may be due to their use as a pecking-hammer. It may as well have been a gambling-stone used for rolling or one on which to throw dice.

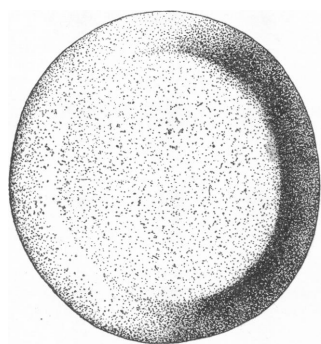


Fig. 28 (1898). Stone Disk. From main shell-heap at Eburne. Length, 185 mm.

Stone celts mounted as adzes were used until recently by the Indians of this region for finishing boards split with wedges. They were also used for finishing canoes, and the regularity of the scars left by each adze-stroke marked the skill of the workman. A Kwakiutl Indian was discovered and photographed while sharpening a stone adze at Fort Rupert, on Vancouver Island, as late as 1898. Recently the stone celts used as adzes have been replaced by iron files sharpened for the purpose, and by axe-blades cut in two on a plane at right angles to the cutting-edge.

In the shell-heaps at both Port Hammond and Eburne celts of stone only were found. The discovery of thirty-two at the former and twenty-three at the latter shows that they were in common use, about as prevalent as the chipped stone

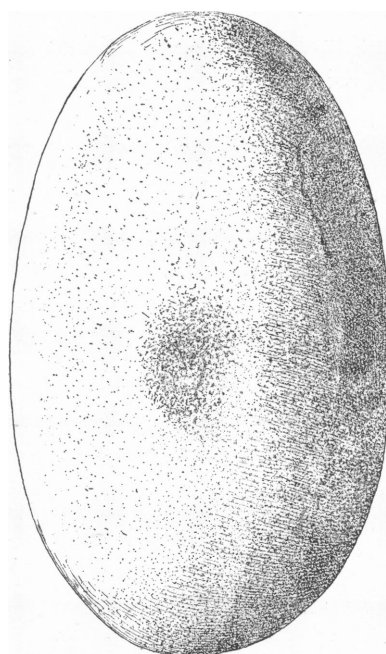


Fig. 27 (1898). Pitted Hammerstone. From shell-heap at Port Hammond, surface. Length, 167 mm.

points. In general, these celts are made of nephrite, serpentine, and rocks of similar appearance. They are shorter than those found in the Thompson River region,¹ and a large proportion of the specimens are softer and more opaque. The small size of the implements may be due to the remoteness of the source of supply and to the extensive employment of the material for adzes, which necessitated its economic use. Many of these objects are burned. They vary in size from 184 mm. to 48 mm. in length, 85 mm. to 16 mm. in width, and 18 mm. to 7 mm. in thickness. The cutting-edge is usually convex, but one of a very few specimens that have a slanting edge. The

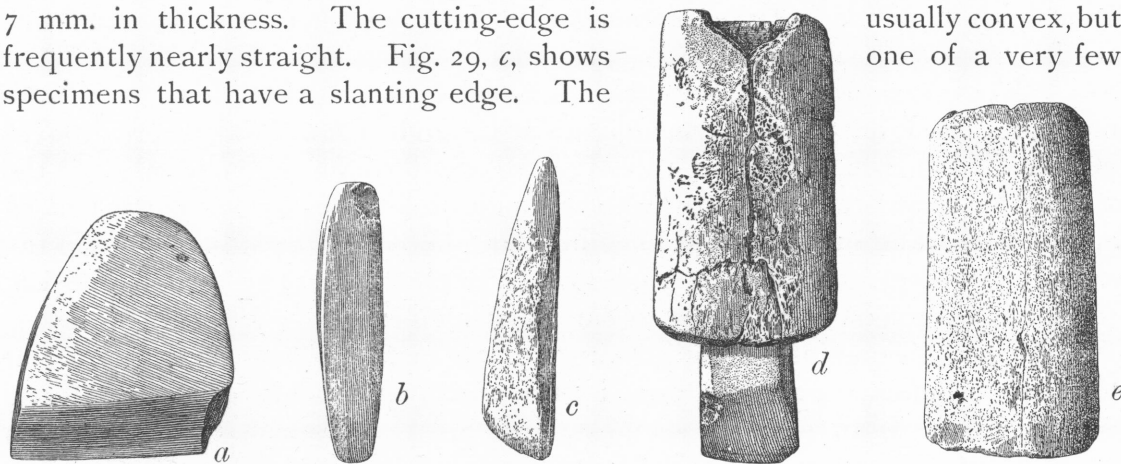


Fig. 20. Celts of Stone, and Hafts of Antler. *a, b*, from Eburne; *c-e*, Port Hammond. $\frac{1}{2}$ nat. size. *a* ($\frac{18}{5173}$), of nephrite, from main shell-heap, thickness 9 mm.; *b* ($\frac{16}{5259}$), of nephrite, from main shell-heap, found near Skeletons Nos. 33, 34 ($\frac{99}{1779}$, $\frac{1780}{1780}$), thickness 13 mm.; *c* ($\frac{12}{3443}$), from main shell-heap, Trench No. 2, found near Skeleton No. 19 ($\frac{92}{1583}$), thickness 10 mm.; *d* ($\frac{17}{4276}$), of nephrite, from main shell-heap, Trench No. 2, $3\frac{1}{2}$ ft. deep; *e* ($\frac{15}{4362}$), from main shell-heap, Trench No. 2, 4 ft. deep.

cutting-edge is formed by bevelling the object from each side; and in some cases this bevel is much greater from the flatter side than from the rounder side of the celt. Many of the bevels are quite short, so that the edges are not very acute. Such an edge is shown in Fig. 29, *a*. Only a few of the celts of this region have long bevels at the cutting-edge.

In section the body of the celt is usually rectangular, with rounded corners, or lenticular. A few have sections in the form of a flat hexagon. In outline the celts are usually rectangular, but often irregular. A few tend to be narrower at the top than at the cutting-edge, some of these being somewhat triangular (see Fig. 29, *a, c*). The tops are often square across, some are irregular, but many are smoothed, all corners and projections being rounded off. Some are pyramidal in form (Fig. 29, *c*). One top is bevelled on each side; but as the extreme end is broken away, it cannot be determined whether this specimen was double-bladed or whether the top was simply bevelled to a blunt end.

Ground grooves, by means of which the celt was cut, and the broken edges between opposite grooves, show on the side edges of nearly half of the specimens. Some show the ground groove-marks on the flat surfaces. In some cases these grooves and broken edges are nearly effaced by grinding and polishing, in others they are quite unchanged. One specimen in particular shows the grooves dis-

¹ See Vol. II, pp. 142, 416, 417.

tinctly, since the break did not follow one of the grooves, as desired, but deviated from it,¹ leaving a fragment attached to the celt.

No specimens were found which were simple flakes broken from a boulder and sharpened on one edge.² The material of these celts was identified by Mr. George F. Kunz. The first of the series of typical celts selected for illustration (Fig. 29) shows one in which the blade bevels more from the flat side.

Fig. 29, *b*, represents one of the narrowest celts. The top seems to have been shivered as if it had been pounded. This suggests that the object may have been used, at least part of the time, as a chisel, without being hafted.

Fig. 29, *c*, shows a celt with a slanting blade formed by a long bevel from each side. The left edge is rounded, while the right edge shows where grooves were rubbed in each side about a third of the way through the material; and the central third was broken, after which the rough broken surface was partly effaced by rubbing. The material resembles nephrite, but it has been burned; and the hardest part, near the top, seems too soft for that material. The color is greenish.

Celts were sometimes hafted in handles made of antler. Fig. 29, *d*, shows a celt which was found in place in its haft of antler by the writer in the presence of Mr. J. John Oakes, at a depth of three feet and a half below undisturbed shell-layers in Trench No. 2, in the main shell-heap at Port Hammond. The hafting is a piece of antler, oval in section, the surface being but slightly changed from the natural form of the material. The ends are cut more or less square across, with the outer edges somewhat rounded, — more than the edges of the holes, which are apparently unintentionally rounded by wear. In each end of this cylinder is a more or less irregular hole, somewhat oval in section, tapering slightly towards its bottom; the upper one being 34 mm. deep, the lower 27 mm. The cylinder being 84 mm. long, 23 mm. of material are left between the bottoms of these holes. The celt is 55 mm. long, 25 mm. wide, 12 mm. thick, and was inserted in the haft fully 25 mm.

In Fig. 29, *e*, is represented a celt-haft 92 mm. long, which is a piece of antler oval in section, the outer surface only slightly changed from the natural form of the material. The ends are cut across, but the corners are somewhat rounded. The holes in each end are roughly oval, and taper but slightly. The upper one is 28 mm. deep, while the lower one is 33 mm. deep, leaving between them 31 mm. of undisturbed antler material. The object was found four feet deep in Trench No. 2 in the main shell-heap at Port Hammond.

On the surface of the little shell-heap at Eburne a longitudinal piece of one of these hafts was found, which had been smoothed about a third of the way from each end. The ends were cut squarely across, and a perforation had been made about 10 mm. from one edge, penetrating into the hole where the celt would fit. Three other pieces of such celt-hafts of antler were found at Port Hammond. One of these, found three feet deep, is cut square across at one end,

¹ Cf. Fig. 29, *c*, right side; also Vol. II, p. 142, Figs. 40-42; p. 143, Figs. 44-46.

² Cf. Vol. II, p. 142, Fig. 43.

while the other end is convex to the edges of the hole. This difference in the two ends suggests that one end of these objects was used for a different purpose from the other end. Another is of special interest, because at each end the inner cellular part of the antler seems to be compressed, while in the middle it is not. This would seem to be due to the celt having been driven into the end of the antler. In the Thompson River region it is said that celts were formerly hafted in handles of antler.¹ In hafting knives the present natives of that region boil the antler to soften it, drive in the knife-tang, and the antler afterwards hardens and holds the knife firmly. This method may have been employed for hafting the celts found in this area.

It seems probable that the upper hole in these hafts received the tip of the adze-handle. It has been suggested that a celt might have been inserted in each hole to form a double-bladed adze to be used by grasping it around the antler haft; or, again, by hafting the antler, and using it as a double-bladed adze, axe, or weapon.

A fragment ($\frac{16}{4017}$) of a ring made of antler was found in the original surface-soil below Shell-heap No. 1 at Port Hammond, which at this spot is four feet deep. The fragment is 22 mm. wide. One edge is rounded from the side and is smooth, the other is bevelled by rough whittling. The inner side shows coarse cellular structure, and is much decayed. It seems possible that this may have been used to fasten a celt to a handle by overlapping the two through this ring or ferrule.

Several small bone rings were found at Port Hammond which may have served as ferrules for tools smaller than celts, but they may have been used as beads, and so are mentioned on pp. 155 and 180.

It is possible that small celts were hafted in the holes in the two prongs of the carved object of antler shown in Fig. 59, and used as knives. The specimen, however, shows no definite signs that anything was driven into these holes.

It may be mentioned here that the object shown in Fig. 57 may perhaps have been used as an adze-handle, the flat blade being attached, by means of thongs, under its flat bottom; but neither form nor material (a gray sandstone) seem quite adapted for this purpose. The greater width of the central portion of the stone, the adjoining notches, and, above all, the perforation, indicate that the object was originally tied to another piece.

It is not impossible that an adze with such an elaborate handle may have been used ceremonially. I have seen the natives "break a copper"² with a ceremonial wooden implement shaped like their ancient stone slave-killer, and afterwards go out of sight of the participants in the ceremony and cut the copper with a white man's cold chisel. On the other hand, this stone carving may have been the crutch-like handle of a staff for use by a shaman or speaker.

¹ See Vol. II, p. 415.

² See F. Boas, *Social Organization and Secret Societies of the Kwakiutl Indians* (Annual Report U. S. National Museum, 1895, p. 354).

Two specimens were found which illustrate the manner of securing material for celt-blades. One, collected from the main shell-heap at Eburne by Mr. Oliver, is a flat piece of dark-green serpentine of irregular form and somewhat square edges, rubbed and polished on the sides and edges except where one end is broken away. Extending more than halfway along one side edge is half of a groove with longitudinal striations; the remainder of the edge is a broken surface that has since been battered. The bottom of the groove is nearly straight, if not concave; so it could not have been made with a string and sand, but may have been cut by a gritstone.¹ On the grooved side, and parallel with the groove, is a series of longitudinal lines forming an oblong pit which may be the beginning of another groove. Fig. 30 represents the other specimen. It is a small boulder of nephrite speckled with black. It shows scratches in various directions on all parts. The ends are broken, and the smaller one is battered. While both sides are worn smooth in places, the lower one is partly broken away and then smoothed. The deep, laterally curved cut in the upper surface was evidently made with a gritstone after the ends were broken. This is shown by the downward curvature over the broken ends.

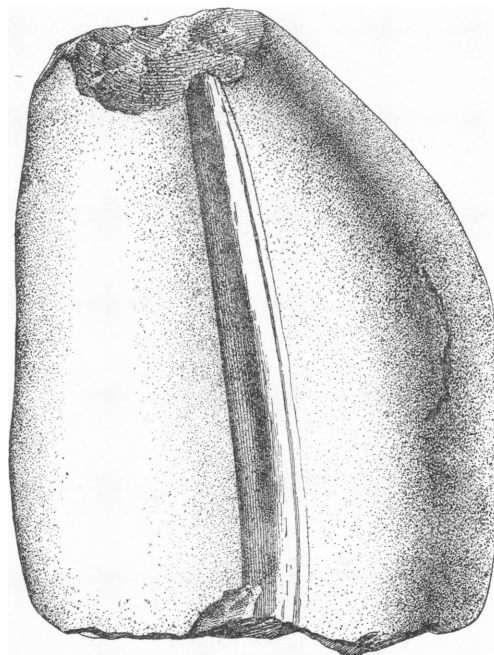


Fig. 30 (3148). Nephrite Boulder, partly cut by means of a Groove. From main shell-heap at Port Hammond, surface. Length, 160 mm.; thickness, 65 mm.

Fragments of siliceous sandstone, a few having bevelled edges like those of the Thompson River region, were found in both the main and little shell-heaps at Eburne and at Port Hammond.² They probably served to cut grooves in serpentine, nephrite, or other rock, preparatory to breaking it into pieces along the line of the grooves.

A piece of a point, probably for a spear or dagger, and evidently made of a fragment of a slate knife, was found one foot deep in Shell-heap No. 1 at Port Hammond. The base and point were broken off, and near the latter grooves were rubbed on each side as if to cut it squarely across. It may have been intended to form this into a celt-blade (see p. 160). Some slate knives which are sharpened on the shorter edge may have been used as adze-blades.

Flat fragments of stone, varying from 50 mm. to 360 mm. in length, and from 10 mm. to 110 mm. in thickness, were found in about equal proportions at both places, fifty-two being collected at Eburne, and seventy-three at Port Hammond. Some were rubbed to a fine polish on one or both sides. Some specimens showed

¹ See Vol. II, pp. 143, 146.

² See Vol. II, p. 143, Fig. 47.

in places wide grooves such as would be made by sharpening a celt or adze blade; others (Fig. 31), short grooves such as might be made in sharpening an

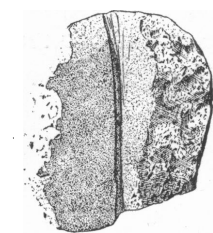


Fig. 31 (3485a). Part of Gritstone with Groove. From main shell-heap at Port Hammond, surface. Length, 55 mm.

awl. They are more numerous than the stone points, and almost as frequent as bone points. Those with wide grooves somewhat resemble the mortars with two and four shallow oval bowls. They are usually of coarse sandstone, gritty gneiss, and other siliceous rock or stone of granular structure, all of which were evidently chosen because of the grit, which is very fine in only a few cases. Pieces seem to have been most frequently selected which were thin-bedded, evidently as they could be broken into convenient size. In most cases the broken edges are not clean fractures. They are slightly worn, as if by handling and rubbing

against other tools; while in some cases the object has been made from a fragment somewhat worn by nature, probably by the surf. On some of the pieces the edges were rubbed apparently with an attempt to bring them to a plane at right angles to the surface. These stones were evidently used for grinding and sharpening bone and stone implements, etc., although they may also have been used as anvils upon which to crush food. The last-named purpose is indicated by one specimen from Eburne which has pecked into its centre a shallow pit about 5 mm. deep and 50 mm. across.

There are pieces of schistose rock of various forms, some of them finger-shaped, which may have been used as whetstones.

Knives made of beaver-teeth, such as were found at Lytton,¹ were not found here; nor were any knife-handles seen, unless we consider as such the specimen shown in Fig. 59.²

Considerable numbers of bone implements, that were probably used in the manufacture of garments, baskets, nets, etc., were found. Fig. 32, *a*, shows a very thin bone object only about 1 mm. thick and 8 mm. wide, with rounded corners, and highly polished from use. It is noticeable that the ends are slightly sloped towards the left. Fig. 32, *b*, shows a similar thin bone object about 1 mm. thick and 12 mm. wide. These objects may have been used as mesh-measures in the manufacture of nets.

Bars of antler and of bone, possibly used for chipping stone into points, plaiting baskets, or similar purposes, were found. Fig. 33, *a*, shows one of these which is oval in section, though somewhat flat on the edges and sides.

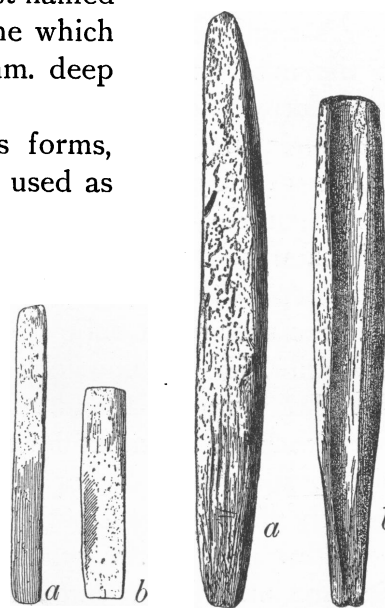


Fig. 32.

Fig. 33.

Fig. 32. Bone Objects, possibly Mesh-measures, Port Hammond. $\frac{1}{2}$ nat. size. *a* (3889), from Shell-heap No. 1, in original surface-soil, 4 ft. below surface of heap; *b* (3883), from Trench No. 2, in shell-layer $2\frac{1}{2}$ ft. deep.

Fig. 33. Objects made of Bone. $\frac{1}{2}$ nat. size. *a* (3887), from main shell-heap at Eburne, south side, found in shell-layer 3 ft. 6 in. deep, near Skeleton No. 62 (1887); *b* (3882), from Shell-heap No. 1 at Port Hammond, lowest layer.

¹ See Vol. II, pp. 144, 417.

² See p. 186.

Its point is blunt. The smoothed parts of the basal tang show longitudinal striations, which suggest that the object was to be hafted, and that it may have been an arrow or spear point in process of manufacture.

Fig. 33, *b*, represents another bar with battered end and broken point. The form of the point is such that the object may have been a sharp chisel rather than a blunt bar.

Pieces of bone ($\frac{16}{5267}$, $\frac{16}{5151}$) more or less oval in section, and sharpened to a point, are numerous in the main shell-heap at Eburne. They may be unfinished spear or harpoon points, or may have been implements for plaiting basketry. Two specimens from the main shell-heap are rather large. One collected by Mr. Oliver is probably the proximal part of the ulna of an elk, with both ends broken off and the distal end sharpened. The other specimen ($\frac{16}{5153}$) is a sharpened splint of a large bone. Longitudinal grooves in the marrow-canal indicate that the implement may not have been completed. It may have served as a dagger or for basket-plaiting and general domestic purposes. Another specimen ($\frac{16}{5520}$), made of bone of the whale, is flat, 8 mm. thick, and 30 mm. wide. Only the tip is preserved, which is square, the sides tapering slightly towards it.

A thin slice cut from the outer surface of a bone, flat on the outside, was found in the main shell-heap at Eburne. One end is slightly sharpened, the other irregularly rounded. It resembles a paper-cutter, and may have been a tool for basket-plaiting. There are a number of specimens similar to this in being thin and light. One ($\frac{16}{4299}$) is sliced off in the same manner, but has a chisel-like end. Another ($\frac{16}{4171}$) is made of a rib sharpened to a point. The other end is broken irregularly, and the whole object is polished by use. It was found two feet deep in Shell-heap No. 1 at Port Hammond.

A flat piece of bone ($\frac{16}{4473}$) polished on one side from wear, and showing on the other side the bone-cells, was found in Trench No. 4 at Port Hammond. It is broken off at each end.

Some stone flakes, flat on one side with chipping on the other, and resembling "turtle-backs," were found. Others are rather flat flakes or pieces of slabs roughly chipped from both sides ($\frac{16}{5791}$, $\frac{16}{3360}$, $\frac{16}{5642}$, $\frac{16}{5302}$).

Few implements were found which are supposed to have served for the preparation of skins, but many awls and needles were secured.

Skin-scrapers made of stone were not seen, unless we may consider as such the little scrapers previously mentioned, and this does not seem plausible. Longitudinal pieces cut from bones (Fig. 34, *a*) may have served as skin-scrapers. They are similar in general style and shape to the skin-scrapers made of bone that are found in the Thompson River region.¹ The comb-like object shown in Fig. 42 may have been used in preparing fur.

Fig. 34, *a*, shows an implement that may have served as a skin-scaper. It is made of the metapodial bone of a ruminant, probably a deer. A section has

¹ See Vol. II, p. 147, Figs. 65, 66.

been cut out by two grooves at right angles to each other. On the right surface, at the edge of the canal, is a slight longitudinal flange, a remnant of bone not cut by the groove, which proves that the use, at least of this particular specimen, was not severe enough to break this small projection. The object is smooth, especially at the edges of the canal.

There were found in the main shell-heap at Eburne one entire specimen and seven fragments of similar specimens cut from bones of like character. One fragment was found at the little shell-heap at Eburne. Many of them show little flanges at the bottom or edge of the groove where it meets the marrow-canal.

Twenty-eight such broken pieces were found at Port Hammond. One ($\frac{16}{3788}$) had the sharp edges formed by the groove meeting the curved outer surface of the bone, squared at right angles to the plane of the groove by rubbing, and two specimens had the articular ends cut square across. Nine of these twenty-eight specimens, and twenty-one out of the thirty found at Eburne, were sharpened at one end, like awls (see p. 171). It is probable that such broken pieces were often made into awls and other implements; and it is possible that some of them were cut out as material for such purposes, rather than for skin-scrapers.

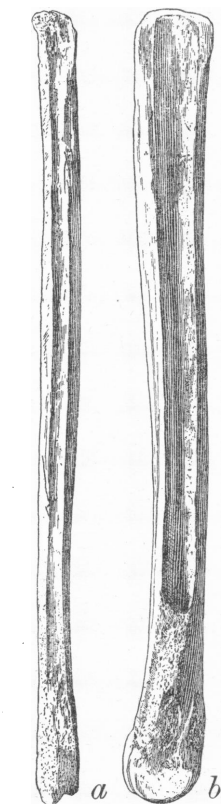


Fig. 34. Bones cut longitudinally. *a* ($\frac{16}{3788}$), from Shell-heap No. 1 at Port Hammond, found in original surface-soil, 4 ft. below surface of heap, near Skeleton No. 3 ($\frac{16}{3788}$), length 210 mm.; *b* ($\frac{16}{3788}$), sharpened at one end, from main shell-heap at Eburne, 6 ft. 6 in. deep, length 208 mm.

Fig. 34, *b*, represents a metapodial bone of an ungulate, from which a longitudinal portion, about equal to half of the specimen, has been removed by means of grooves rubbed longitudinally from the outside of each edge into the marrow-canal. The striations on these cut surfaces show lengthwise. At the bottom, half of the distal articulation remains. This natural articulation forms a convenient handle. The upper end is

brought to a chisel-like edge, and is the widest part of the object. This edge is highly polished, while the sides are also somewhat polished, but become less smooth towards the handle. The object may have been a skin-scaper,¹ and either the end or sides may have been used. Awls and needles could be laid in the marrow-canal and held there by wrappings to keep them from being broken when not in use.

Awls made of bone were numerous, but none chipped from stone or made of shell or metal were found. Some of them may have been used in plaiting baskets (see also pp. 147, 168).

Awls made of the proximal part of the ulnæ of deer were of great frequency. This type of awl is widely distributed in America.² Twelve were found in the main shell-heap at Eburne, and they are about equally numerous at Port

¹ See Vol. II, p. 145, Fig. 54; and p. 441.

² See Vol. II, p. 420.

Hammond. Two ulnæ with the thin lower end ready to be sharpened into awls, and eight finished awls, as well as one made of an elk ulna and one made of the ulna of a smaller mammal ($\frac{16}{3407}$), were found in the shell-heap at Port Hammond. Some of those from each place are sharpened to a round point; others have chisel-like points. Some have short points; others, long and slender ones. Bones of both young and old animals were used in their manufacture. One from Eburne was burned.

By far the greatest number of awls are mere splinters of bone of mammals, sharpened at the acute end. Others are made of fragments of longitudinally cut bones resembling skin-scrapers, such as are shown in Fig. 34. Three of those from Eburne are well trimmed and come to a point, like the upper end of the specimen shown in Fig. 35, *c*. These specimens are much polished from use. One awl from Eburne is made of antler. One found in the natural surface material below Shell-heap No. 1 at Port Hammond is a sharpened thin fragment of a bird-bone. Many pieces of bone bearing evidence of longitudinal cutting were found. It would seem that most of these were intended for awls. Slender hollow bones of birds, such as radii and ulnæ, were also used for awls.

One awl found at Eburne is made of the penis-bone of the raccoon, the natural curve of the bone giving a curve to the point of the instrument, so that it resembles a shoemaker's awl.

Some of the fragments of the thick bones are rubbed so as to have a nearly circular section and well-formed points. Some seem to have been driven by pounding, as the bases are shattered. One ($\frac{16}{4201}$) found in Trench No. 2 at Port Hammond has an incised groove around the handle about 5 mm. from the end. This would facilitate tying a cord to it, if such were desired. A few are broken at the lower end. In some of these the break is worn smooth. One of these (Fig. 49, *a*) is ornamented by incised lines.

A number of awls are illustrated in Fig. 35. In *a* is shown a bone awl made of a portion of the distal end of the metapodial of an ungulate, probably a deer. The half of the distal articulation which remains forms a convenient handle. It is polished as if from use. This type of awl is also widely distributed in America.¹ One specimen of this kind ($\frac{16}{5083}$) is reduced on either side at about its middle. From there the conical point is narrower and more acute. In *b* is represented a bone awl made of a portion of the distal end of the shaft of a tibia of a young ruminant, probably a

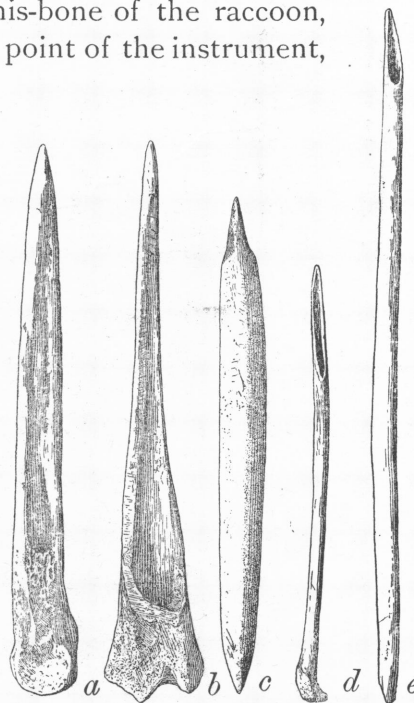


Fig. 35. Bone Awls. *c*, from Port Hammond; the rest from Eburne. $\frac{1}{2}$ nat. size. *a* ($\frac{16}{7185}$), from main shell-heap, collected by William Oliver; *b* ($\frac{16}{5382}$), from main shell-heap; *c* ($\frac{16}{4382}$), from main shell-heap, Trench No. 2, 4 ft. deep; *d* ($\frac{16}{5298}$), *e* ($\frac{16}{5142}$), of bird-bone, from main shell-heap.

¹ See Vol. II, pp. 148, 420.

deer. Transverse striations show on the specimen. In *c* is illustrated an awl made of a slab of bone. The under side is flat; the upper follows the natural curve of the bone. The tip is sharpened to a conical point. The base, which is the part most highly polished from wear, tapers gradually to a point. In the same figure, *d* and *e* represent awls made of bird-bones. Both are highly polished by use. One is broken off at its lower end, while the other retains the natural articulation.

Thirteen needles¹ made of bone, both fine and coarse, were found, but only in the main shell-heap at Eburne. Their absence among the finds from Port

Hammond, where, on the whole, a great variety of objects were found, seems noteworthy. Each of these needles had an eye. Seven of the specimens belong to the fine variety illustrated in Fig. 36, *a-c*. These vary in size from one specimen ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$) found in the lower shell-layer seven to eight feet deep, which is 64 mm. long, to the one shown in Fig. 36, *c*, which is 140 mm. in length. The shafts are oval in section, and are made of solid bone. The eye is always lenticular, with its longer axis lying nearly in the axis of the needle, and is always located from about a fourth to a half of the length of the needle from the end. It is made by grooving from both sides until the two grooves meet.

Fig. 36, *a*, illustrates a needle with a slightly oblique eye near the middle; and about halfway between this eye and the end of the needle is a groove, which was apparently started to form this eye, and abandoned, or else it is the beginning of a second eye.² The finished eye shows evidences of wear from a string passing through it, the ends being enlarged and a groove extending from the lower end towards the lower groove. The lower end is sharpest, but this thread groove shows that the needle was passed towards the opposite, blunter end. The specimen is much polished from use.

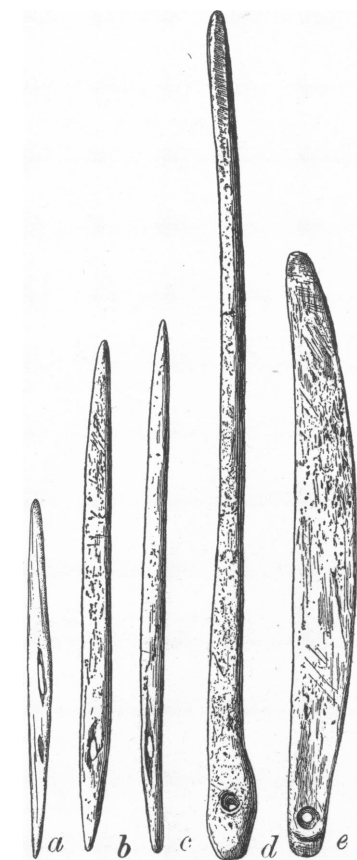


Fig. 36. Needles made of Bone. From main shell-heap at Eburne. $\frac{1}{4}$ nat. size. *a* ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$), collected by William Oliver; *b* ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$); *c* ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$); *d* ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$), found in front of face of Skeleton No. 24 ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$); *e* ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$).

Fig. 36, *b*, shows a typical needle much worn, especially in the eye. The specimen is peculiar in that a groove is worn from the side of the lower end of the eye obliquely upward to the right edge of the needle on both sides. This may have been caused by pulling the needle back to tighten a stitch or knot after having taken a forward motion with it.

Fig. 36, *c*, shows a typical needle, sharper at the point than at the base. It is polished from use. One specimen ($\frac{1}{8} \frac{1}{8} \frac{1}{8}$) from the main shell-heap at Eburne

¹ Cf. Vol. II, pp. 149 and 421.

² Cf. Vol. II, p. 421, Fig. 358, *e*.

is broken across through the middle of the eye, and also across the shaft, where it was very wide. It may be that this wide part was the handle, and that in sewing it was used with the eye-end for the point.

The coarse needles are of two kinds,—those that are nearly circular in section, and those which are flat,—both kinds having the eye in the end. Four specimens of the variety having cylindrical shafts were found. The points of all but one are broken and missing. The broken end of one is worn smooth. The eye is always circular, and drilled in the usual way, by countersinking from each side until the two conical pits meet to form a perforation. It is always located in a part of the bone which is naturally thin and enclosed by natural ridges. This part of the bone always forms a sort of head, apparently to afford more room for the drilled hole and to strengthen the sides.

Fig. 36, *a*, represents a coarse, cylindrical needle. It shows that it was made of a rectangular piece of bone, the corners of which were rounded. It is polished from use, except at the point, which seems to have been sharpened by whittling or grinding, since the rest was polished.

Fig. 36, *e*, illustrates a flat needle resembling a paper-knife in form. The edges are rounded, the point sharpened, and the whole surface striated, as if rubbed on a gritstone. The eye is in the lower end, drilled in the usual way from each side. Below the eye are striations concentric with it, and showing where a projection or shoulder on the drill has cut, probably due to the wobbling of the drill.

A specimen ($\frac{16}{5224}$) from the main shell-heap at Eburne resembles closely the lower end of this, but the point is broken and missing. The concentric striations are more marked.

These larger specimens may have been used for other purposes, the perforations serving for suspending and carrying them.

Fig. 37, *a*, shows an object cut and broken from an antler. The tip is made into a nearly spherical knob, which is somewhat polished as if from wear.

Two other objects of similar kind were found ($\frac{16}{5186}$, $\frac{16}{7916}$). Both had small knobs at the ends, set off from the handle by grooves, not by a long neck, as is the case in the specimen here figured.

A similar object is shown in Fig. 37, *b*. Its head is set off from the shaft by a double groove, which forms a ring, and it has an additional groove in the middle of the shaft.

Another tip ($\frac{16}{7911}$) partly cut and then broken from an antler was secured by Mr. Oliver in the main shell-heap at Eburne. It has many incised grooves started around near the tip, as if an attempt had been made to form a wide groove by blending all these scratches, and thus to set off a knob at the end of the antler-tip.

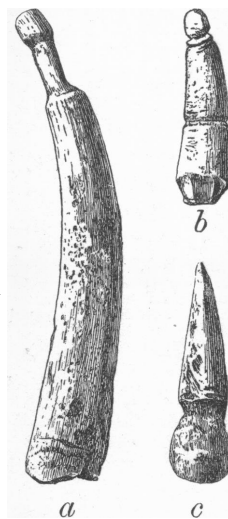


Fig. 37. *a* ($\frac{16}{7489}$), *b* ($\frac{16}{5186}$), *c* ($\frac{16}{7911}$). Antler-tips with Carved Knobs. From main shell-heap at Eburne, *a* and *c* collected by William Oliver. $\frac{1}{2}$ nat. size.

Fig. 37, *c*, shows a tip partly cut and then broken from an antler. It is sharpened to a point of lozenge-shaped cross-section, and polished from wear. At the base a round knob is set off by a groove, which is roughly whittled down from the upper side. No antler-tips with knobs were seen at Port Hammond.

Many of the implements that were used for hunting, and perhaps others that may have been used as tools, were undoubtedly also employed in warfare. The chipped and ground points for spears, arrows, knives,¹ and similar weapons, which have been previously described, certainly served either purpose. The iron blade shown in Fig. 12, *a*, may have been for a war spear or dagger. However, there have been found a number of special implements which were probably useful only in war, or perhaps ceremonially for killing slaves. Some of the sharpened bars of bone described before (see p. 168) may have been used as daggers, if not for basket-plaiting or similar purposes.

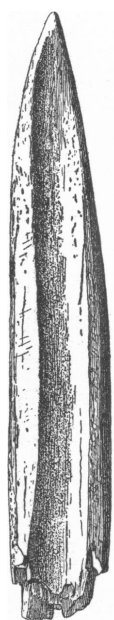


Fig. 38 (4394). Dagger made of Bone. From main shell-heap at Port Hammond, Trench No. 2, 4 ft. deep. Length, 158 mm.

Large bone daggers or knives were found, two in the main shell-heap, one on the surface of the little shell-heap at Eburne and one at Port Hammond. Some of the large bone objects considered as skin-scrapers, sharpened at one end and broken off at the other (see p. 170), appear like daggers. Fig. 38 shows a dagger or knife made of a long bone of a large mammal. The bone has been cut longitudinally. The lower side or outer surface is but slightly changed. All the sides are rounded and smooth from both polish and wear. A bone found on the surface of the little shell-heap at Eburne seems to be the base of such a dagger, the point of which has been broken off. It is tapered, and the edges are somewhat squared like a tang, so that it might have been inserted in a dagger-handle or have been a spear-point.

War-clubs made of bone, antler, or copper, such as were found in the Thompson River region,² were not seen.

Fig. 39, *a*, shows a club made of a green stone resembling diabase in appearance. The upper end is perforated, having been smoothly pecked or irregularly drilled from each side. The hole is about 30 mm. in diameter at the beginning; but in the middle, where the two conical pits meet, the perforation is about 6 mm. in diameter. This perforation is slightly out of centre. A slight groove is pecked parallel to the outline of both the perforation and the head of the object at the sides and end, but not below. This forms a slight median ridge on the head, noticeable when it is seen from one edge. All the corners of these grooves are rounded and smooth. Below the head the club tapers, so that a handle is formed which is nearly a cylinder. It now gradually enlarges, and at the same time becomes more lozenge-shaped in section, as shown in Fig. 39, *c*. This shape is retained to the end of the

¹ See also p. 160.

² See Vol. II, pp. 149, 150, 422.

specimen, which tapers to a rounded or blunt point. The whole object is polished and smooth. It was probably a war-club, but may have been used ceremonially in the killing of slaves, which was practised by the natives of the North Pacific coast. It is 328 mm. long, and was found two feet deep, near skeleton No. 12 ($\frac{9}{1788}$), in the main shell-heap near Eburne. It was probably suspended from the wrist by a thong passed through the perforation.

Stone daggers which were probably similar to this in form were used in the Thompson River region.¹

A similar specimen ($\frac{16}{5019}$) 358 mm. long was found eighteen inches deep and under the roots of a cedar-tree in the main shell-heap at Eburne. The perforation is roughly pecked, certainly not drilled. It is of the same form as that shown in Fig. 39, *a*, but the perforation is even more out of centre as related to the beginning of the pits. From the neck the specimen becomes thicker towards its middle, and then tapers to a point, which is rounded off so much as to be flat on the extreme end. The shaft is more nearly flat than is the case in the specimen shown in Fig. 39, *a*. It is lozenge-shaped with corners rounded. The whole object is polished.

The handle of a stone club ($\frac{16}{5804}$) was found near skeleton No. 35 ($\frac{9}{1781}$) in the main shell-heap at Eburne. It is perforated. The hole, being similar to those in the other specimens, is also out of centre. Below the head the handle is oval in section, and is broken off at the point, where the implement abruptly expands edgewise. It therefore seems plausible that this implement may have had a paddle-shaped shaft similar to a specimen found by us at Burton, in the State of Washington.

A stone club with the handle broken off and missing was found eighteen inches deep in Trench No. 2 in the main shell-heap at Port Hammond. It differs somewhat from the others, in that the shaft is cigar-shaped and polished smooth.

In the collection of Mr. Brooke is a stone club which was pecked and polished. The perforation was pecked and made in the usual way. In section the shaft is diamond-shaped, with corners rounded and sides hollowed, as shown in Fig. 39, *d*. It is about 225 mm. long, and was found at Port Hammond. In the same collection,

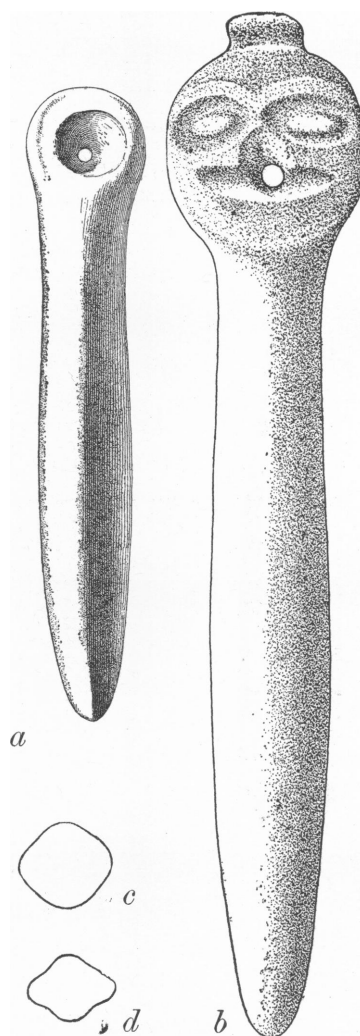


Fig. 39. War or Ceremonial Clubs made of Stone.

a ($\frac{9}{1788}$), from main shell-heap at Eburne, found 2 ft. deep, near Skeleton No. 12 ($\frac{9}{1788}$), length 328 mm.; *b* ($\frac{16}{5019}$), cast from the original (IV A 2406-92, "sakkeko," 9 m. deep, Quamichan Indian area of S. E. Vancouver Island) in the Royal Ethnographical Museum Berlin, length 530 mm.; *c*, section of *a*; *d*, section of club described on p. 175.

¹ See Vol. II, p. 264, where this specimen is also figured.

according to the description of Mr. Brooke, is another, found sixteen inches deep in the eastern end of the main shell-heap at the same place, made of close-grained gray stone ground to a paddle shape with a lozenge-shaped section. It is flaked, battered, and weathered, and was never polished. It is 558 mm. long, 101 mm. wide, 51 mm. thick, and weighs four pounds. There was still another stone club in the Weber collection. Implements of this general character occur on the west coast of Washington and on Puget Sound.¹

Fig. 39, *b*, shows a stone club somewhat similar to the one seen in Fig. 39, *a*. A human face is represented in intaglio on the head, which is surmounted by an elongated knob. This knob may represent the dressed hair. The perforation passes through the mouth and upper lip. The face is convex, with the chin set well forward. The back of the head is concave. The general style—more particularly the knob—resembles that of certain carvings found on southeastern Vancouver Island. Several of the skulls found had circular holes crushed in them about the size of the points of these stone clubs.

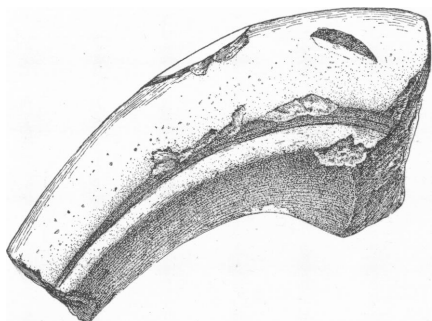


Fig. 40 (1887). Fragment of an Object made of Stone. From Shell-heap No. 1 at Port Hammond; found in original surface-soil, 4 ft. below top. Length, 126 mm.

Fig. 40 represents a fragment of an object made of steatite or nearly allied material. It has the shape of a beak. The section is rhomboidal, with the lower acute corner rounded. Both ends are broken off. The thicker one has been somewhat smoothed by rubbing at the top. It has a median groove on each side. Between the groove and the upper acute edge, at the widest end of the fragment, is a rubbed pit about 15 mm. long, slanting obliquely upward from the groove end. The general shape and the groove suggest the beak of a bird, the small oblique groove representing the nostril. It seems probable that the object might have been a blade of an implement resembling the double-bladed stone axe which is found on Upper Puget Sound, in Columbia Valley, and in northern California.¹ The rubbing of the broken end suggests, however, that the fragment was worked on after the fracture had occurred.

A comb-like object, some materials that may have been used as paints, and a considerable number and variety of objects supposed to be personal ornaments, were found. These include copper objects, labrets, pendants (probably for the nose, neck, or ear), shell beads, and also objects made of bone that may have been nose-bars, wristlets, and anklets. No ornaments made of pecten or abalone shell were found.

That cedar-bark was shredded for weaving into garments and mats, is suggested by a fragment of a bark-breaker ($\frac{1}{4} \frac{6}{3} \frac{6}{4}$) identical with those used by the

¹ See Smith, *Archæological Investigations on the North Pacific Coast in 1899* (*American Anthropologist*, 1900 p. 565).

present natives. The fragment is from one end of the breaker, which is made of bone of the whale. The upper and lower parts are broken off and missing, but the whole object becomes gradually thinner from the upper to the lower edge. The thin end was sharpened by a curved surface on each side, beginning about 20 mm. from the edge. In the upper corner of the other end of the fragment a small part of the surface of the perforation for the hand is left. The specimen was found in the black surface-soil two feet deep in Trench No. 2 in the main shell-heap at Port Hammond. The present natives weave garments in the form of cloaks from the finely shredded cedar-bark, and they plait mats from strips of the same bark.

A fragment of a human frontal bone found twenty-six inches deep, and above skeleton No. 27 ($\frac{99}{1773}$) in the main shell-heap at Eburne, was much stained with copper salts, and on it was a piece of copper much disintegrated. This was covered with shreds of cedar-bark. Cedar-bark was probably used in many ways as clothing. The present natives use it as bedding in the cradles of children.¹

Buttons or toggles for fastening garments are suggested by a single bone object which may as well be a buzz for use as a toy. It is shown in Fig. 41, and is a flat piece of bone with a notch across the middle of each edge. The whole object is smooth, with corners and grooves worn. It was found 3 ft. 4 in. deep, in the main shell-heap at Eburne, at the left side of an adult skeleton, No. 25 ($\frac{99}{1771}$). Since so few specimens not belonging to wearing-apparel are found with skeletons, it seems probable that the object was a button on a garment rather than a toy, which, if buried with a body, would more likely have been found with the skeleton of a child.



Fig. 41 ($\frac{99}{1773}$).
Bone Button.
Length, 31 mm.



Fig. 42 ($\frac{99}{1773}$). Comb-like Object made of Antler. From main shell-heap at Eburne. Length, 100 mm.

Fig. 42 represents a comb-like object made of a sliver from the outer surface of an antler. The upper part is of irregular form, with somewhat square end, and sides diverging toward the lower part, which is cut by longitudinal grooves into eight teeth, five of them broken off. The upper part is worn smooth. It was perhaps used for combing the hair or in preparing furs.

Painting the face and parts of the body may have been practised. A very small quantity of red ochre was found. Some white earth, part of which was infusorial, may have been used, and probably charcoal mixed with grease was also employed as paint. Mortars which may have been used for paint are shown in Figs. 54 *b* and 55 *d*.

Some fragments of mica were found which may have been used for decorating the costume or on ornaments of some sort.

The copper stain on a human frontal and on a human lower jaw, found in the main shell-heap at Eburne, suggests that ornaments of copper were worn over

¹ See Swan, l. c., p. 18.

those parts of the body. A piece of copper so much disintegrated that its form could not be determined was on part of another frontal found 26 inches deep and above skeleton No. 27 ($\frac{99}{1773}$) in the main shell-heap at Eburne.

Fig. 43 illustrates a copper object in the shape of a perforated disk. This perforation is not concentric with the outline of the object. It was made by bending edgewise a bar of copper widest in the middle. The ends of the bar were not welded, but the object, when found, was so covered with salts of copper that it appeared as a continuous ring. It was found lying against the teeth of skeleton No. 42 ($\frac{99}{1773}$), 26 inches deep in the main shell-heap at Eburne, and was probably a nose-ornament worn by pinching it over the septum.

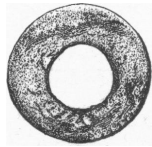


Fig. 43 ($\frac{99}{1773}$). Copper Object. From main shell-heap at Eburne, found against teeth of Skeleton No. 42 ($\frac{99}{1773}$). Diam., 18 mm.; thick., 2 mm.

I have seen two stone labrets that were found at Port Hammond. One is in the collection of Mrs. Ellen R. C. Weber. The other (Fig. 44) is in the collection of Mr. Reginald C. Brooke.

Fig. 45, *a*, shows a pendant made of ivory. It is cone-shaped, with the smaller end slightly flattened and the tip rounded off. The whole surface is highly polished.

Fig. 45, *b*, represents a fragment of a stone object, possibly part of an ear-ornament. It seems that the object was originally a short tube, possibly part of a pipe, with three equidistant rings at its upper rim (cf. Fig. 55, *a*).

The canine tooth of a dog ($\frac{16}{332}$), with a hole drilled through the middle of the root, was found in the main shell-heap at Eburne. The hole is considerably worn, and much of the surface is smooth and polished. The incisor of an elk ($\frac{16}{332}$), found in the main shell-heap at Eburne, bears a transverse cut across the lower half of the root on the front side. The lower side is cut square, and the upper side slants down to meet it.



Fig. 45. Ornaments. $\frac{1}{2}$ nat. size. *a* ($\frac{16}{332}$), pendant made of ivory, from main shell-heap at Eburne, 3 ft. deep; *b*, stone object, possibly a fragment of an ear-ring, found at Port Hammond, collected by James Scott (from a drawing by Reginald C. Brooke, of the specimen now in his collection).

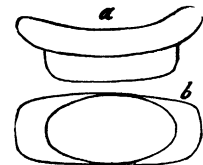


Fig. 44. Stone Labret: *a*, side view; *b*, bottom view. From main shell-heap at Port Hammond. Length, 48 mm. (In the collection of Mr. Reginald C. Brooke, Port Hammond, B. C. From a sketch by the author.)

Wristlets and anklets are suggested not only by the copper and stains of copper salts, but also by thin pieces of bone and a fragment of shell. The bone fragments were bent sideways. Each of the pieces found has one or more holes in one end, and may have been tied to similar holes at the opposite end. One of these specimens is a thin flat piece of bone with rounded edges, tapering from 24 mm. to 19 mm. in width. It is broken off at the wider end. The end forms an obtuse angle roughly cut across, and is perforated by a transversely oblong hole gouged from the flat side. The whole surface is slightly polished. It is somewhat bent, so that its longitudinal axis is convex. It was found in the main shell-heap at Eburne. Another specimen found in the same place is also thin, and tapers from 45 mm. to 32 mm. in width. In the narrow end, which is irregular on account of the disintegration of that edge, is a nearly circular hole

gouged from each side. The surface is greatly disintegrated. The curvature of the fragment is such that the complete piece would form a hoop about 100 mm. in diameter.

In Fig. 46, *a*, is represented an oblong fragment of a bone object, probably a wristlet similar to those worn by the shamans of Alaska. It has sharp edges. The under side is flat transversely, but slightly concave longitudinally. The upper side is convex transversely. The surfaces are smooth, especially at the edges. The left end, as well as the right, is broken off. In the middle of the left end is a perforation gouged from each side. It is worn noticeably smooth on the side towards the left; and on the upper surface, from the perforation to the end, is a slightly polished surface or groove.

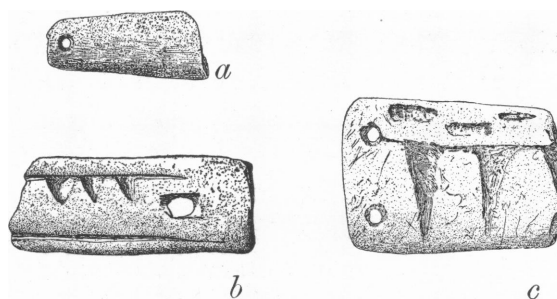


Fig. 46. Fragments of Bone Objects, probably Wristlets. From main shell-heap at Eburne. $\frac{1}{2}$ nat. size.

a ($\gamma\frac{1}{2}\frac{1}{2}$), *b* ($\gamma\frac{1}{2}\frac{1}{2}$), collected by William Oliver; *c* ($\pi\frac{1}{2}\frac{1}{2}$), bearing incised lines and areas, found near Skeleton No. 43 ($\tau\frac{1}{2}\frac{1}{2}$).

Fig. 46, *b*, shows a fragment of a bone object, probably a wristlet. In the middle of the right end is a hole 6 mm. long, roughly gouged from both sides. Its lower edge is highly polished. The under side to the right of this perforation is flat; from around the hole to the left end it is hollowed out like a wide shallow trough with narrow rim. The upper side is convex transversely. The whole object is bent slightly, so that longitudinally also this side is convex. It is decorated by a design of incised areas cut about 1 mm. deep. The surface of the object and the projections of the broken end are polished and smooth, especially on the rims of the trough, as might be expected if it were worn as a bracelet.

Fig. 46, *c*, represents a fragment of a thin bone object, probably a wristlet. The edges are rounded and smooth, the upper one being slightly sharp. The surfaces curve evenly, being thinner nearer the finished edges than near the centre. The right end, which is broken off, has since been worn smooth on the projections. It is decorated on the upper rim with a geometrical design consisting of incised triangles and two parallel rows of rectangular incisions. Another specimen that may have been a wristlet is shown in Fig. 51.

A fragment of a shell object ($\gamma\frac{1}{2}\frac{1}{2}$) was found in the main shell-heap at Eburne. It seems to be made of a piece of a shell of *Hinnites gigantea* Gray. A narrow strip has been cut out of the shell, which, if complete, would form a ring about 100 mm. in diameter, and suitable for a bracelet. The outer surface is polished as if from wear.

A large number of shell-beads, distributed in four lots, were found. Three of these were in the main shell-heap at Eburne. They are well-made disks, varying from 5 mm. to 8 mm. in diameter and about 1 mm. thick. The perforation in the centre is drilled in the usual way, tapering from each side. One lot was

found 1 foot deep, another around the neck and along the spine of skeleton No. 12 ($\frac{99}{1778}$) 3 feet deep. Some of the beads were stained by salts from the copper found with the skeleton. A third lot was with skeleton No. 13 ($\frac{99}{1780}$) 3 feet deep, and 7 feet distant from No. 12. The fourth lot consisted of beads similar to those described above, but only from 3 to 4 mm. in diameter. They were found around skeleton No. 14 ($\frac{99}{157778}$) in the lowest layers of Shell-heap No. 1 at Port Hammond, less than a foot from the bottom.

Six dentalium-shells were found with skeleton No. 2 ($\frac{99}{1748}$) in the main shell-heap at Eburne. It seems noteworthy that so few of these shells were used in this region, where they may readily be obtained; while in the Thompson River region, where they can be procured only by barter, they were much more numerous in the village sites.

The bone tubes previously described (pp. 155 and 166) may have been used as beads. The rings or shorter tubes, especially, seem suited to this purpose. Several bone rings were found at Port Hammond. Two cut from firm long bones of mammals may also have been beads. One, which is about 8 mm. long and 20 mm. in diameter, was found in the same layer with Skeleton No. 7 ($\frac{99}{1571}$) one foot above the bottom, in Shell-heap No. 1 at Port Hammond. The other came from the same shell-heap. It is 10 mm. in diameter, 20 mm. long, but is marked across the middle of one side as if to be cut into two parts. It resembles certain bone beads found in the Ohio Valley. It was found in Trench No. 6, in 1898, in the main shell-heap at Port Hammond. These were referred to on p. 166 as possibly having been ferrules for holding small tools in their handles.

Fig. 47 illustrates a flat bone object with rounded edges. The right end is cut off slantingly. The left end is bifurcated, the ends of the lobes being rounded; and the edge of the notch between the lobes is sharp. The entire surface of the object is polished.



Fig. 47. ($\frac{99}{1838}$). Bone Object. From main shell-heap at Eburne, collected by William Oliver. Length, 68 mm.

In the collection of Mrs. Weber is a piece of steatite about 6 mm. thick, and of an irregular oval outline, approaching the shape of a pear. Through the upper end is a perforation drilled in the usual way from each side, and tapering towards the middle. A disk of steatite in the same collection is about 6 mm. thick, 25 mm. wide, and 47 mm. long. It is perforated in a similar way by eleven holes, arranged in three parallel rows, two of four, and one of three holes. This specimen is said to have been found near where Trench No. 2 was cut, in the main shell-heap at Port Hammond.

A fragment of the bowl of a tubular pipe made of steatite was found ($\frac{16}{4118}$). It is shown in Fig. 48, *a*. It is a strip about 14 mm. wide, extending from the rim of the bowl to the stem, and shows that the bowl narrowed gradually into the stem.¹ The rim is cut across square. It is not polished, like the rest of the surface of the pipe. An oblong perforation near the rim seems to have been made

¹ Cf. Vol. II, p. 154, Figs. 103-105; p. 157, Fig. 111; p. 429, Fig. 374.

in order to mend the pipe by tying the broken pieces together. The inner side is thickly coated with charred material.

Figs. 48 *b* and 55 *a* show fragments of tubular pipes. They were found at Port Hammond by Mr. James Scott, and are now in the collection of Mr. Reginald C. Brooke, who kindly placed his information on the subject at our disposal, and furnished the sketches from which the accompanying drawings have been made. The former is made of steatite, and consists of the base of the bowl and the adjoining part of the stem. The latter is probably of the same material, and is decorated with the figure of an animal the back of which bears a small ring (cf. Fig. 45, *b*).

There are in the collection of Mrs. Weber several stems of pipes from Port Hammond similar to those found by us in the Thompson River region. Mrs. Weber believes that these were left there by Indians from the interior who came on hostile missions. She further states that she has a legend from the Indians living near Port Hammond which relates that their ancestors did not smoke.

A pipe similar in form to the one shown in Fig. 48, *a*, was found in the shell-heap near Sidney.¹ According to information given by Dr. C. F. Newcombe of Victoria, B. C., another pipe was found in 1891 on an old village site at Fulford Harbour, Salt Spring Island, B. C. He states that it is made of what appears to be black soapstone, is 58 mm. long, with a maximum diameter of 23 mm.; that there is an incised ring around its middle; and that it is in the collection of Lieut. G. Pike, H. M. S. "Virago," R. N. A piece of a very large pipe of this general style, but with a more flaring mouth, was found by us in a shell-heap at North Saanich.

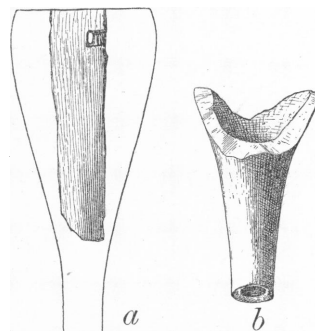


Fig. 48. Tubular Pipes, made of Steatite. Port Hammond. $\frac{1}{2}$ nat. size. *a* (x188), found under Shell-heap No. 1; *b*, collected by James Scott (from a drawing, by Reginald C. Brooke, of specimen now in his collection).

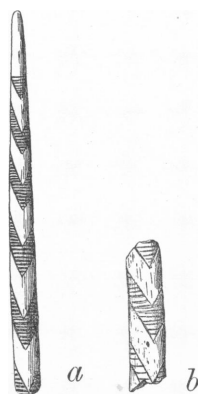


Fig. 49. *a* (x188), *b* (x187). Bone Objects bearing Incised Geometric Designs: *a* from Shell-heap No. 1, *b* from Trench No. 4, Port Hammond. $\frac{1}{2}$ nat. size.

A number of decorated objects were found, sufficient to give an insight into the characteristics of the style of art of the prehistoric people of this region. The technique of decoration consists entirely of etching in bone and sculpture and etching in antler and stone. Red ochre, white earth, and charcoal, that were found in the shell-heaps, indicate that painting was also practised.

The art of this region differs from that of the North Pacific coast in the extensive application of geometric designs. The zigzag lines on the bone points shown in Fig. 49, *a*, *b*, and on the stone mortar in Fig. 53, *a*, are quite different from any

¹ Cf. Vol. II, p. 429.

motives applied by the present inhabitants of the North Pacific coast. They resemble decidedly designs employed by the Indians of the Thompson River region, particularly some of the designs on prehistoric objects. The zigzag designs with hachure shown in Fig. 49, *a*, *b*, are quite similar to those on the dentalium-shells from Kamloops.¹ The etched designs on the harpoon-point shown in Fig. 50 remind us of the same designs, but more particularly of the etchings on a dagger² made of antler and on bone carvings from the same place.³ The

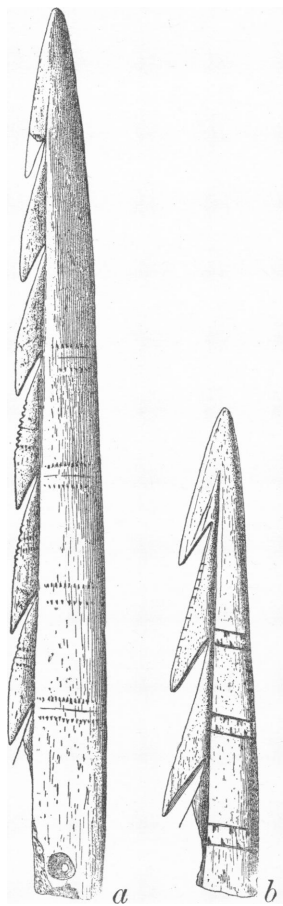


Fig. 50. Harpoons bearing Incised Geometric Designs. $\frac{1}{2}$ nat. size. *a* ($\gamma\frac{1}{2}\frac{1}{2}$), from Port Hammond, Trench No. 3, 2 $\frac{1}{2}$ feet deep; *b* ($\gamma\frac{1}{2}\frac{1}{2}$), from main shell-heap at Eburne, collected by William Oliver.

harpoon-point Fig. 50, *a*, has, besides the decorations on its face and on the barbs, which are shown in the illustration, five similar decorations on its back edge, each consisting of three lines, — one continuous middle line, and two lateral lines composed of short triangular incisions. These are placed in the middle, between the corresponding decorations on the face of the harpoon, the highest one being nearer the point of the harpoon than the corresponding ornament on the face. The three lowest barbs have broad edges, which are decorated with a number of incised transverse lines crossed by one incised longitudinal line. The transverse lines have the appearance of notches in the illustration. The harpoon-point shown in Fig. 50, *b*, is decorated in a similar manner. The back edge is divided by an incised medial line, which begins near the base of the terminal barb. Looking at the harpoon-point with the tip away from the body, there are series of short incised lines alternating to the left and to the right from this middle line, there being three groups towards the left, and two groups between them towards the right. The groups of incised lines turning to the left may be recognized in the illustration. The upper edges of the barbs are decorated in a similar manner. Looking down upon the barbed edge of the harpoon, the tip away from the body, a series of incisions will be observed on the second barb extending from the middle line towards the right, while on the third barb similar incisions are found turning from the middle line towards the left. These designs resemble very much the

designs found on the digging-stick figured in Vol. II, p. 137.

Incised geometrical designs are also found around the rim of the stone mortar shown in Fig. 53, *a*.

A different technique is used in the decorations on the bracelets shown in Fig. 46, *b* and *c*, the geometrical design being incised.

¹ See Vol. II, p. 431, Fig. 379.

² Ibid., p. 423, Fig. 360, *b*.

³ Ibid., p. 424, Fig. 362; p. 429, Fig. 375.

A peculiar decoration is found on the bone object shown in Fig. 51. The wedge-shaped part of the ornament with angular lines also reminds me more of designs from the interior than of those from the coast. The line on the left side of the small fragment on the left of the object suggests that a corresponding ornament was on the missing portion. The only characteristic difference between these incised geometrical designs and those found in the interior of British Columbia seems to be the complete absence of circular designs with central depressions. Notwithstanding the prevalence of geometric designs similar to those of the Thompson River region, no specimens were found exhibiting the pictographic combinations of geometric forms which is so characteristic of the interior. The arrangement of geometric designs on the finds from the shell-heaps seems, on the whole, to be more regular than in the interior. Fig. 46, *b* and *c*, shows a peculiar method of decoration. The objects are evidently small sections of much longer strips. The decorative motive consists of a number of long triangles attached to a horizontal line. In Fig. 46, *c*, there are, over these, small rectangular depressions arranged alternately in two horizontal rows.



Fig. 51 (1882). Bone Object bearing Incised Geometric Design. From main shell-heap at Eburne, near surface, found near Skeleton No. 26 (1882). Length, 85 mm.

All the remaining objects are decorated with more or less realistic animal figures. The style of these is much cruder than that of the more recent art of the North Pacific coast. The type seems to my mind to resemble somewhat the art of the present Indians of Lillooet, and perhaps also, more generally speaking, that of the region between Lower Fraser River and Upper Columbia River.

Three very interesting barbed harpoon-points were found at Eburne, all evidently representing sea-animals (Fig. 52). The etching is the same on both faces. The first and the third are represented with open mouth, while the second one has the mouth closed. Back of the eye are a number of parallel lines which may be interpreted either as gills or as flippers. In the first specimen the curved line setting off the gills is continued forward on the lower edge of the harpoon. The ridge over and back of the eye is sharp in the first and second specimens, and provided with notches and incised lines which may perhaps be interpreted as a continuous dorsal fin or as scales. The third specimen has a flat upper edge above and back of the eye, which, however, is provided with cross-incisions. A short incision runs back from the middle of

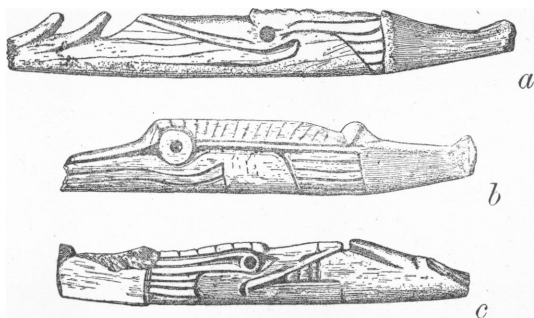


Fig. 52, *a* (1882), *b* (1883), *c* (1882). Fragments of Harpoon-points made of Bone or Antler, incised to represent a Fish. From main shell-heap at Eburne, *c* collected by William Oliver. $\frac{1}{2}$ nat. size.

¹ See Vol. II, pp. 378, 430.

each cross-incision. The lowest barb may be observed opposite the point of the upper jaw of the animal. In all three specimens the under face, which is more porous, is very much worn.

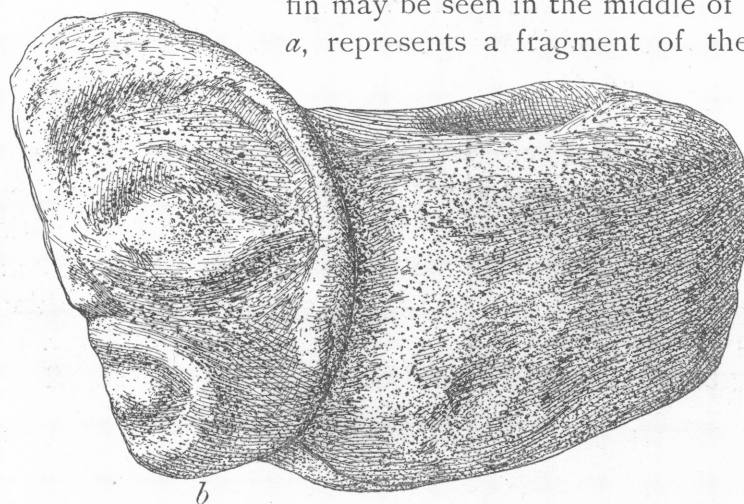


Fig. 53 Mortars made of Stone.

a (5016), with rim ornamented by incised lines and a sculptured human head; from main shell-heap at Eburne, 3 ft. deep in black soil; height, 90 mm.; greatest diam., 122 mm. *b* (5016), from a cast of the original, No. 614 Cat. Provincial Museum, Victoria, B. C., collected by C. Hill-Tout, 1898; greatest length, 228 mm; locality not given.

The mortars illustrated in Fig. 53 are decorated with human heads. The second of these mortars has a very rough surface, so that it does not appear clearly whether the body of the mortar is intended as a human body. Fig. 54, *a*, shows a mortar in animal form, probably representing a fish. Seen from the top, the mortar is slightly asymmetrical. The paint-mortar illustrated in Fig. 54, *b*, is of a somewhat similar character. It probably represents a diving porpoise. The dorsal

fin may be seen in the middle of the convex side. Fig. 55, *a*, represents a fragment of the bowl of a tubular pipe,

probably made of steatite (see p. 181). An animal form is carved on it. In the same figure, *b* and *c* are reproduced from Charles Hill-Tout.¹ The carving shown in *d* is a portion of a paint-dish. It represents an animal head, the bowl of the dish being on top. In form it resembles very much a carved whale-vertebra found by F.

Boas in the shell-heap at Comox. The war-club from Quamichan (Fig. 39, *b*) is decorated with the representation of a human face.

Fig. 56 represents a mortar with four legs, and a handle in the form of the head of an animal. The head seems to be that of a bird, probably an owl, while the mortar itself gives the impression of being the body of a quadruped.

In Fig. 57 an object made of sandstone is shown, which may have been used as a handle (see p. 166). Its lower side is flat, the middle portion protruding slightly below the ends. It was evidently attached to some kind of a base, and may have served as the handle of an adze or as the end of a cane. Notches on

¹ Later Prehistoric Man in British Columbia (Trans. Roy. Soc. Canada, Second Series, 1895-96, Vol. I, Sect. II, Plate III).

both sides of the perforation were evidently intended for tying the object to its base. In the middle line under the chin is a deep groove extending backward as far as the ornamentation around the face, and gradually increasing in depth. The portion of the object behind the head is evidently intended for the body. There are six nearly equidistant longitudinal grooves along the back of this body. The decorated rim around the face somewhat resembles the rims around modern carvings of this district, which indicate plaited rings of cedar-bark worn around the head, but it may as well represent the hair.

Fig. 58 represents a remarkably good carving made of uintahite. It is perforated at the top, and seems to have been a pendant.

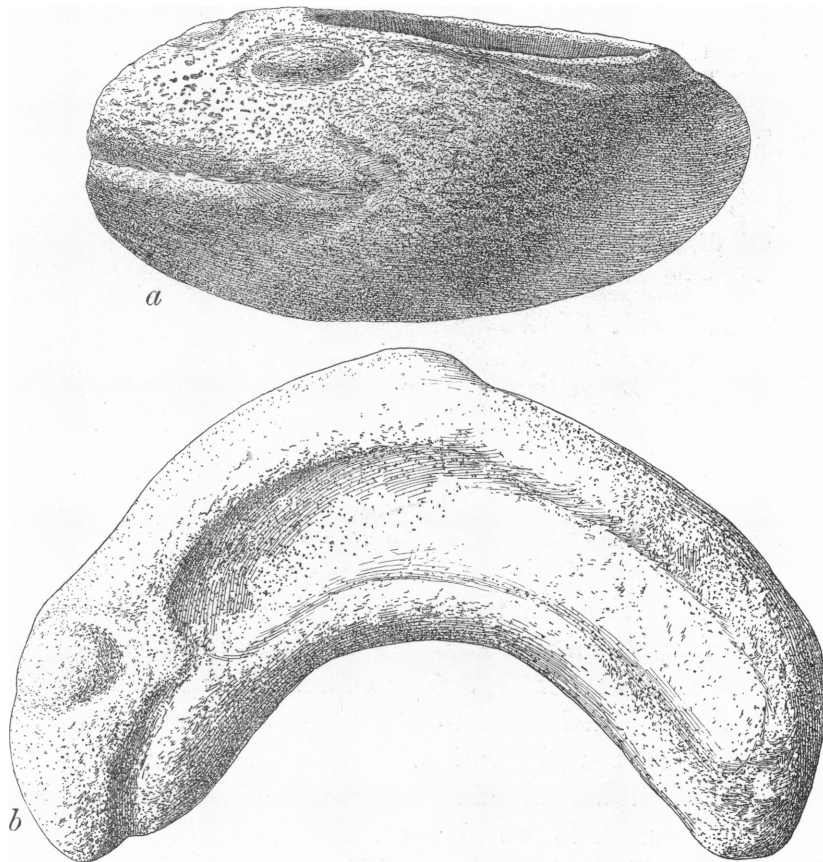


Fig. 54. Sculptures in Stone, used as Mortars.

a (7883), from main shell-heap at Eburne, collected by William Oliver, length 203 mm., height 80 mm.; *b* (8887), from a cast of the original, No. 618 Cat. Provincial Museum, Victoria, B. C., collected by J. Sprott, 1892, from shell-heap on north arm of Fraser River, length 216 mm.

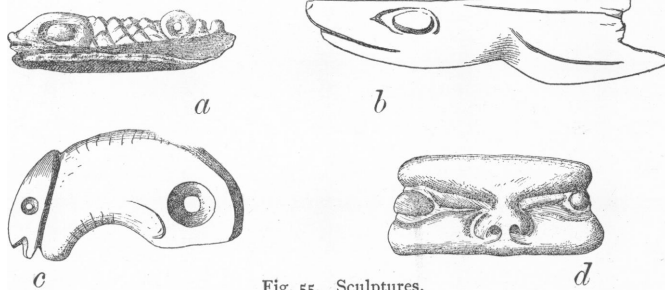


Fig. 55. Sculptures.

a, fragment of a stone pipe bearing a sculptured animal form, from Port Hammond, collected by James Scott (from a drawing by Reginald C. Brooke of the specimen now in his collection), length 59 mm.; *b*, *c*, of bone or stone, from main shell-heap at Eburne (redrawn from Fig. 3, Plate III, p. 111, of "Later Prehistoric Man in British Columbia," by Charles Hill-Tout, Trans. Roy. Soc. Canada, Second Series, 1895-96, Vol. I, Sect. II.); *d*, of stone, probably used as a small mortar, from Port Hammond, collected by James Scott (from a drawing by Reginald C. Brooke of the specimen now in his collection) width 55 mm.

The front represents a face the style of which resembles somewhat the modern art of the North Pacific coast. It has a very high polish, and looks like jet. The posterior surface is almost flat.

In Fig. 59 is represented an object made of an antler decorated at each end with conventionalized human or animal forms. A human figure will be recognized at the left-hand end of the piece of antler. It is squatting, the hands raised to the chin, the

elbows touching the knees. The mouth is indicated by two horizontal notches; the hair, by parallel etched lines surmounted by small grooves placed at regular intervals. This end of the object is much worn. A similar figure occupies the opposite end. It is placed in about the same position, the hands touching the chin, and the elbows resting on the bent knees; but in place of the human head we find a bird's head, the beak of which is cut out of a branch of the antler.

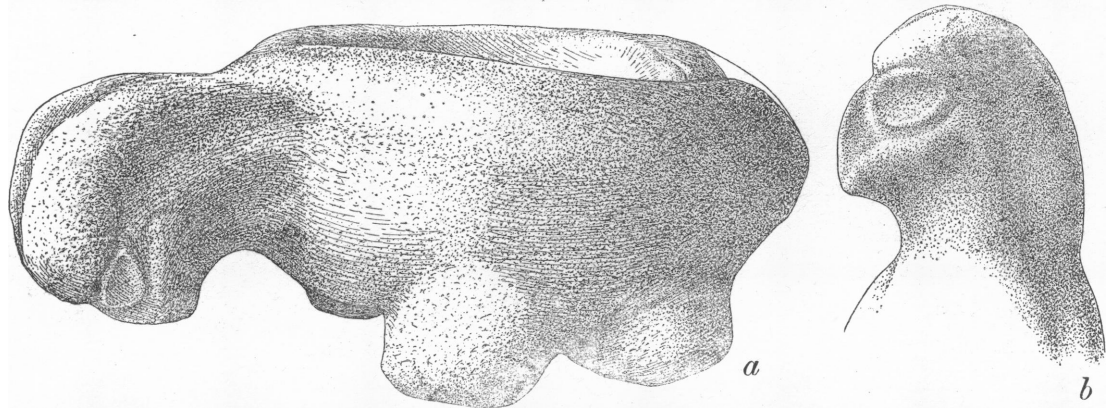


Fig. 56 (7882). *a*, Sculpture in Stone, used as a Mortar, from main shell-heap at Eburne, collected by William Oliver, length 233 mm.; *b*, Profile View of Head of Sculpture.

This may represent a mask worn by the man. The lower convex side of the object, near its middle, has been shaved off over the whole undecorated extent between the two terminal figures, and the centre seems to have been hollowed out. There is a hollow in the ends of each of the two prongs on the right-hand side of the illustration. It looks as if some object had been inserted in these two hollows, the one rising from the head of the bird, the other protruding from its beak (see pp. 156, 166).

At both Port Hammond and Eburne most of the skeletons were found in that part of the shell-heaps farthest from the river; and at the Musquiam Indian Reserve we noticed that the bodies were in little houses and back of the village, which is on a ridge and faces the sea. The skeletons were flexed, and lay upon the side. In no case were objects found in such a manner as to prove that they were buried with the bodies, except the copper ornament shown in Fig. 43 and the beads mentioned on p. 179. These were probably left attached to the body and clothing rather than deposited with the body at the time of burial. A few of the skeletons were in disorder, as if they had been reburied. Some stray bones, and even stray skulls, occurred. Some skeletons were found covered by a few boulders, both bones and boulders being covered by shell-heap material.¹ It is notable that in Shell-Heap No. 1 at Port Hammond the specimens were

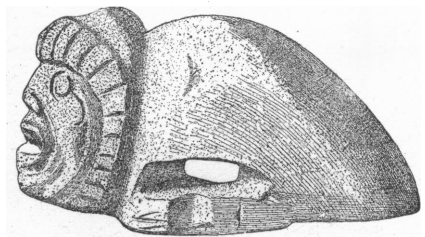


Fig. 57 (8082). Sculpture in Stone, probably used as part of an implement. From main shell-heap at Eburne, found 3 in. below Skull No. 3 (1885), which was 1 ft. deep. Length, 104 mm.

¹ See p. 59 of this volume.

most numerous in the layers in which the skeletons were found, although their location indicated that they were not buried with the bodies. In the layers in which no skeletons were found the proportion of specimens to shell-heap material was small. Thirty-three human skeletons were secured by us from the shell-heaps at Port Hammond during two months' excavations; seventy-five were

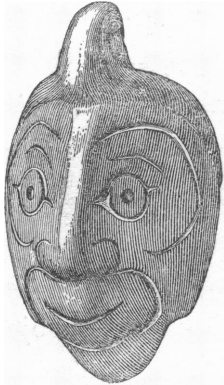


Fig. 58 ($\frac{1}{16}$ in.). Sculpture in Hydrocarbon, probably used as a Pendant. From main shell-heap at Eburne; found 3 ft. 6 in. deep, and 1 ft. west of Skull No. 5 ($\frac{1}{16}$ in.), in gravel.

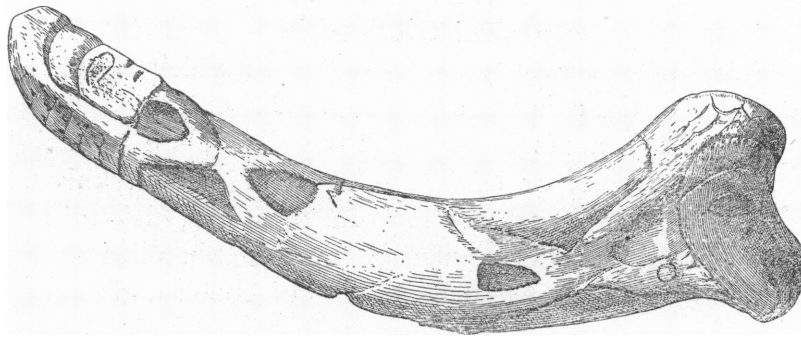


Fig. 59 ($\frac{1}{16}$ in.). Carved piece of Antler. From Shell-heap No. 1 at Port Hammond, in original surface-soil, 4 ft. below top. Length, 215 mm.

found in the shell-heaps at Eburne during about a month's work. At Port Hammond we secured only one type, while at Eburne two were found. There was no apparent difference in the condition of the bones of the two types or of those of the upper and lower layers of the shell-heaps, all being fairly well preserved. None of the skeletons appeared to have been intrusively buried, and the apparently undisturbed shell-layers were continuous above all that were found at sufficient depth to show any layers above them.

The shell-heaps of the Lower Fraser River seem to have certain peculiarities of their own, and vary in detail not only from most of the shell-heaps of the coast region, but also from those of the delta areas of the Stillaguamish and Skagit Rivers. The objects secured from the former are more numerous and of a higher artistic value than those found in the coast shell-heaps, or even in those of the other deltas. Human skeletons are frequently found in the shell-heaps of the Lower Fraser. They are rarely met with in the coast shell-heaps, and are only occasionally found in the shell-heaps of the Skagit and Stillaguamish deltas.

On the whole, the difference in character between the delta shell-heaps and those of the coast seems to be due to the blackness of the surrounding soil, poor drainage, and the dissimilarity between the mode of life of a delta and that of a seacoast people. The more frequent occurrence of skeletons is an unsolved problem, since the scarcity of cairn-burials is common to the immediate neighborhood of both the Lower Fraser River, where skeletons are found in the shell-heaps, and to the northern part of Vancouver Island, where they are absent from the shell-heaps. The difference between the various delta shell-heaps seems to

be due to the fact that the culture of the inhabitants of the Lower Fraser River was more highly developed than that of the inhabitants of other parts of the coast, probably on account of a more favorable environment and a location where intercourse between tribes of different cultures was greater than in neighboring regions.

There is no apparent difference in the character of the specimens found in the upper and in the lower layers. The general style of the objects is similar to those made by the present tribes of the coast. Several exquisite specimens of stone and bone carvings were discovered which rival in artistic merit the best sculptures of the existing natives.

The implements most commonly found are points chipped from stone or ground from slate or bone and used for arrows, knives, harpoons, or spears; stone pestles or hammers; mortars of stone; fish-knives rubbed out of slate; wedges made of antler; celts of stone; celt-handles made of antler; whetstones or grinding-stones; awls and needles of bone; and engraved and carved objects made of bone and stone.

The finds indicate that the prehistoric people whose remains are found in these shell-heaps had a culture resembling in most of its features that of the present natives of the Fraser Delta. They subsisted to a great extent on fish, which were caught by means of hooks and harpoons resembling in form the corresponding modern devices of the region. Large sea-mammals were hunted with retrieving-harpoons, upon whose manufacture much care was bestowed, some of them exhibiting highly artistic designs. Shell-fish constituted an important part of the diet of the people. They hunted on the mountains, and probably utilized meat and horn of the mountain-goat. Deer and elk were eaten, and their bones and antlers used for many purposes. Dogs were probably used in hunting. Skins of animals were prepared, and served as garments. There is no evidence that the hair of goats or dogs was spun and used for weaving, as has been done in modern times. The people were workers in wood. They used wedges and chisels for splitting and hewing planks. The frequency of these implements indicates that woodwork was no less important in their economy than it is among the modern Indians. No indication as to the character of their habitations has been found. Possibly some of the small knolls may be the piles of refuse thrown near houses. The presumption seems justifiable that they lived in houses made of cedar-planks. They must have had canoes. Shredded cedar-bark was used for a variety of purposes, among others probably for clothing. It was shredded with the same kind of implements as are used at the present time. Possibly mats like those used by the present natives of the region were made by sewing together cat-tail stalks. This is suggested by the flat needles made of bone, which have been described on p. 172.

There are, however, some points of difference between the people of the past and those of the present. First of all, the physical type of part of these people differed very much from that of the modern Indians, while another part

seems to have been of the same type. Professor Franz Boas describes these two types as follows:—

The one type is characterized by a narrow head, the narrowness of which was emphasized by lateral pressure, with a marked median ridge on the forehead, narrow and high nose, and rather

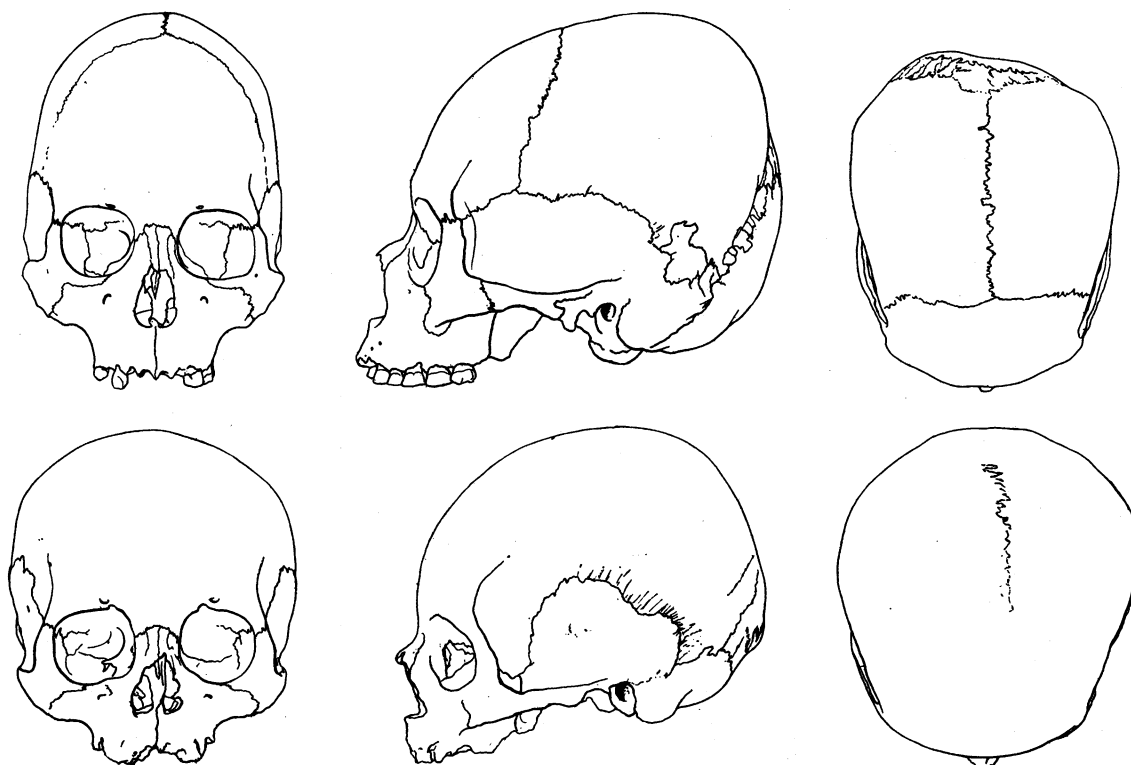


Fig. 60 (1874, 1875). Types of Skulls from Shell-mounds at Eburne: above, three views of narrow type of skull; below, three views of broad type.

narrow face (Fig. 60); the other, by a wide head (produced partly by antero-posterior pressure) and a wide face. The following measurements of a few selected skulls of the two types will illustrate these conditions:

NARROW TYPE.

Catalogue 99, No.....	1816	1544	1752	1813	1812	1810	Average
Sex.....	Male	Male	Male	Female	Female	Female	
Length of head.....	186	163	167	171	182	172	173
Breadth of head.....	147	130	138	141	140	134	138
Height of head.....	146	140	132	136	—	146	140
Minimum width of forehead	98	89	89	95	95	88	92

BROAD TYPE.							
Catalogue 99, No	1762	1780	1766	1788	1770	1747	Average ¹
Sex	Male	Male	Male	Male	Female	Female	
Length of head	169	160	158	173	165	158	164
Breadth of head	145	158	157	158	147	153	152
Height of head	135	135	—	142	126	128	142
Minimum width of forehead	(93)	98	104	98	98	99	98

Differences in culture may also be noticed. Among the natives of the coast of British Columbia the art of chipping stones was not practised. Isolated specimens of chipped points are found all along the coast, but they are frequent only on Fraser River and at Saanich on Vancouver Island, where many of them resemble in both shape and material those of the Thompson River region. The chipped points of Puget Sound and of the west coast of Washington are, on the whole, more similar to the chipped points of Columbia River. These chipped points, the peculiar tubular pipe, which occurs also at Saanich, and the geometrical designs described before, — all point to a close affiliation of the early culture of this region with that of the interior of British Columbia. Some classes of objects that are frequent in the archæological finds of the interior do not occur in the shell-mounds of Fraser River. No drills chipped from stone were found, unless some of the narrower specimens described as arrow-points served that purpose. Some of the more irregular chipped points may have been used as carving-knives, but no other such knives were seen. Pairs of half-cylinders of sandstone for smoothing and straightening arrow-shafts were not found. Beaver-teeth or woodchuck-teeth made into dice, which are now used both in the interior and on the coast, were not found. No objects were found buried with the skeletons, as is the case in the Thompson River region and in modern burials in the Fraser River Delta. The coincidence of the similarity of culture of the prehistoric people of the Fraser Delta and of Saanich with the distribution of languages at the present time is quite striking. The Salish languages reach the coast on the Gulf of Georgia and southward as far as Shoalwater Bay. Their dialects are distributed in such a way that in the same latitude the same dialect is spoken east and west of the Gulf of Georgia. Vancouver Island and the parts of the mainland just opposite must therefore have had a common history, and this is also borne out by the finds at Saanich and on the Lower Fraser River.

It would seem, therefore, that we have here very good evidence of a close connection between the interior and the coast in prehistoric times, much closer than in later periods. It is probable that at an early time a migration took place from the interior to the coast and Vancouver Island. This migration carried the art of stone-chipping, pipes and decorative art, to the coast.

¹ Reduced to the proportion of three males and three females.



Shell-Heaps of the Lower Fraser River.



Shell-Heaps of the Lower Fraser River.

It should be mentioned in this connection that the most highly developed type of Northwest-coast art never extended south of Comox, and never reached the west coast of Vancouver Island. Although more realistic than the decorative art of the interior, the modern art of the region south of Comox and along the west coast of Vancouver Island is crude, as compared with that of the more northern regions.

A few specimens point at similarities between the prehistoric people of the Fraser Delta and those of the north. The most striking is the occurrence of the labret, which in historic times was not found south of Milbank Sound.

The migration referred to before may account for certain changes in ethnological customs, such as the rapid modification of the method of burial on the southeastern part of Vancouver Island. The earliest known kind of burial, and the one that is known to have antedated contact with the whites by a considerable period, was in stone cairns.¹ Later, and even since contact with the whites, the bodies were placed in wooden chests, which were deposited on the ground, in the branches of trees, in caves, or on little islands. A canoe was sometimes used instead of a box.

The fact that skeletons were found in shell-heaps indicates that the customs of this people must have differed from those of the people who made the shell-heaps on northern Vancouver Island in which skeletons have not been found.

We may sum up the results of our inquiries by saying that the culture of the ancient people who discarded the shells forming these heaps was in all essential particulars similar to that of the tribes at present inhabiting the same area, but that it was under a much stronger influence from the interior than is found at the present time.

¹ Vol. IV., Part II.

(Continued from 2d page of cover.)

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