

Chapter Four: EXCAVATION AT TS'ISHAA (DfSi-16)— MAIN VILLAGE AREA

Site Description

The extensive shell midden deposits at Ts'ishaa extend for about 145 metres along the beach facing the pass between Benson and Clarke Islands, from a cobble beach at the west end of the site to a large rock outcrop near the eastern edge. The site then turns at an angle and extends for another 50 metres along a small sheltered beach between two large rocky bluffs. Shallow midden deposits extend out on top of the bluffs, the easternmost of which would make an excellent lookout and defensive location. Along the beach just past this rock is the site of Himayis (DfSi-17), physically separated from the main site but clearly part of one large village location.

A forest fringe today largely hides the site from view from the water. Once through this outer curtain, however, much of the central and eastern portion of the site is open, covered only with grass, small areas of bush, and a few fruit trees remaining from the Euro-Canadian settlement of the early twentieth century. This may have been the area of the most recent Tseshaht habitation, presumably by a smaller social group than in earlier times, and was also the focus of later non-Native use. A steep slope up from the beach clearly indicates that at least three metres of shell midden have accumulated through occupation of this area. Along the eastern edge, between the two large rock outcrops, two distinct site levels possibly represent house platforms. The western half of the site is covered in large trees and fairly open ground characteristic of a mature forest, suggesting that this section was the first abandoned. Three distinct terraces, or possible house platforms, are visible along this western portion, with a steep drop-off behind the uppermost to a gully along the back of the site.

A smaller area of shallow midden was detected through use of soil probes at the back of the site, at a higher elevation behind the main village. A test unit was excavated in this area in 2000 in an attempt to ascertain whether this represented an earlier occupation, at a time when sea levels were several metres higher, predating the accumulation of the large shell midden deposits that mark the main village. After radiocarbon dates from this test unit supported this hypothesis, more extensive excavation was undertaken in this portion of the

site in 2001. The results of these investigations are reported in a separate chapter.

The two Benson Island sites were sketch-mapped in 1982, as part of an intensive archaeological survey project throughout Pacific Rim National Park (Haggarty and Inglis 1985). In 1995, Parks Canada personnel took core samples at Ts'ishaa and prepared a more detailed map, indicating where the core samples were taken (Sumpter, Fedje and Siebert 1997). At the beginning of the 1999 field work, a detailed contour map of the Ts'ishaa - Himayis site area was prepared (by Pat McFadden, a surveyor for Parks Canada). This map shows the major physical features of the site area and the location of all excavation units. It is included in this report as Figure 19.

Extent of Excavation

Three widely-separated areas of the site were excavated, each in a different field season (1999 to 2001). These areas roughly correspond to the presumed locations of the three distinct named descent groups, or *ushtakimilh*, resident at the site, as described by Tseshaht elders to Edward Sapir (see Chapter Two). These were labelled EA (for Excavation Area) 1, 2 and 3, corresponding to the order in which they were investigated. Their locations are shown in Figure 19.

The area initially selected for excavation (EA 1) was in the middle of the open grassy area known to Parks Canada personnel and campers as "the meadows." Four fruit trees still stand in this area, which had been used as farmland by the early twentieth century owners of the island. This central portion of the site was ethnographically associated with the most highly ranked *ushtakimilh*, the Tseshaht (*Ts'ishaa7ath*) proper (Figs. 5, 6:4). A 10 m by 2 m trench (coordinates S 10 to 20, W 25 to 27 m) was laid out between two cherry trees, perpendicular to the beach, with the axis of the trench aligned to magnetic north and the north end extending down the top of the slope to the beach. The entire 10 m trench was excavated until a depth of about 1.4 m was reached. Work then ceased on the two end units, reducing the length of the trench to 6 m for all lower levels. After shoring was installed, excavation in this 6 m section proceeded until the culturally sterile sands and gravels of the original beach were reached. As the strata slope somewhat

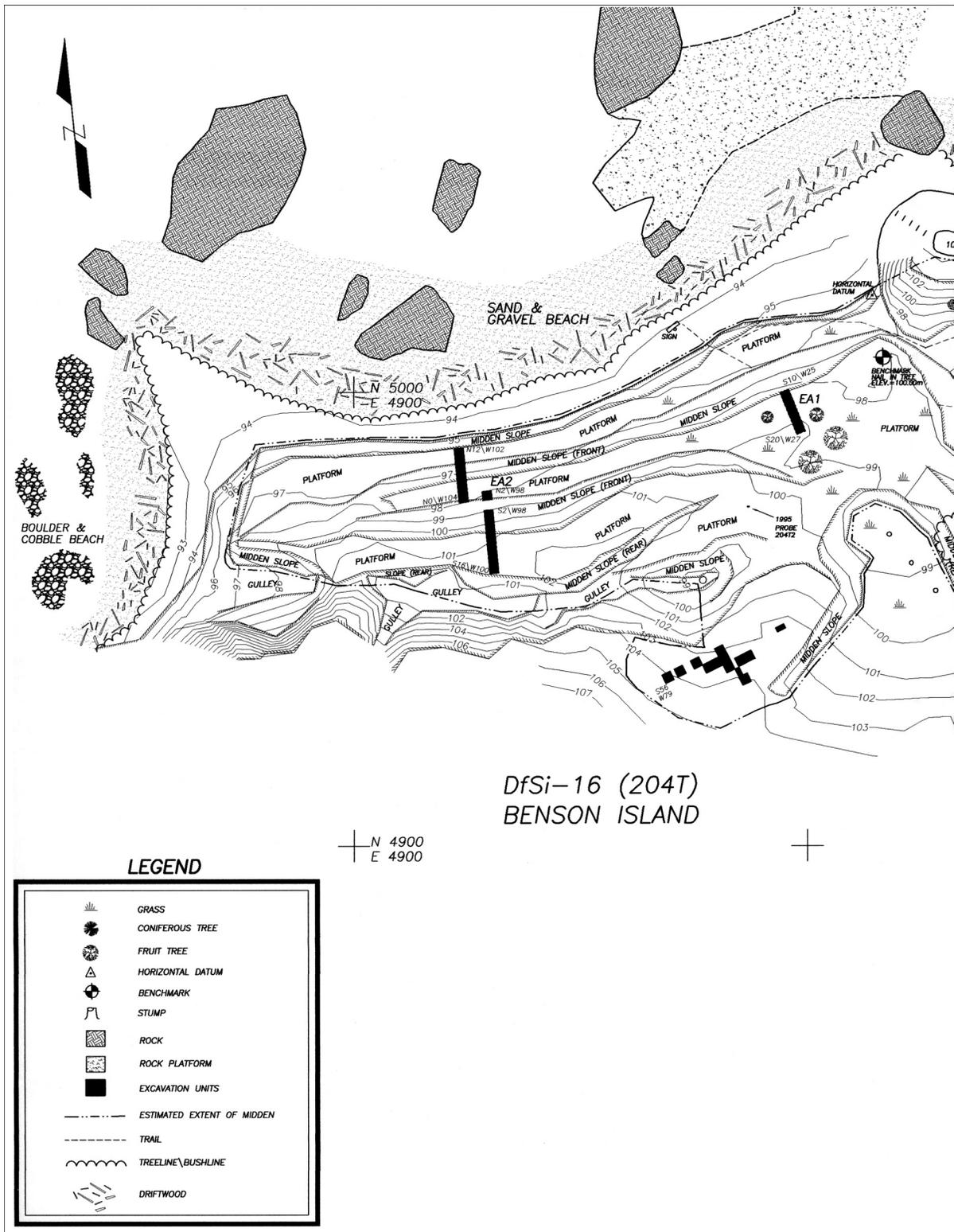


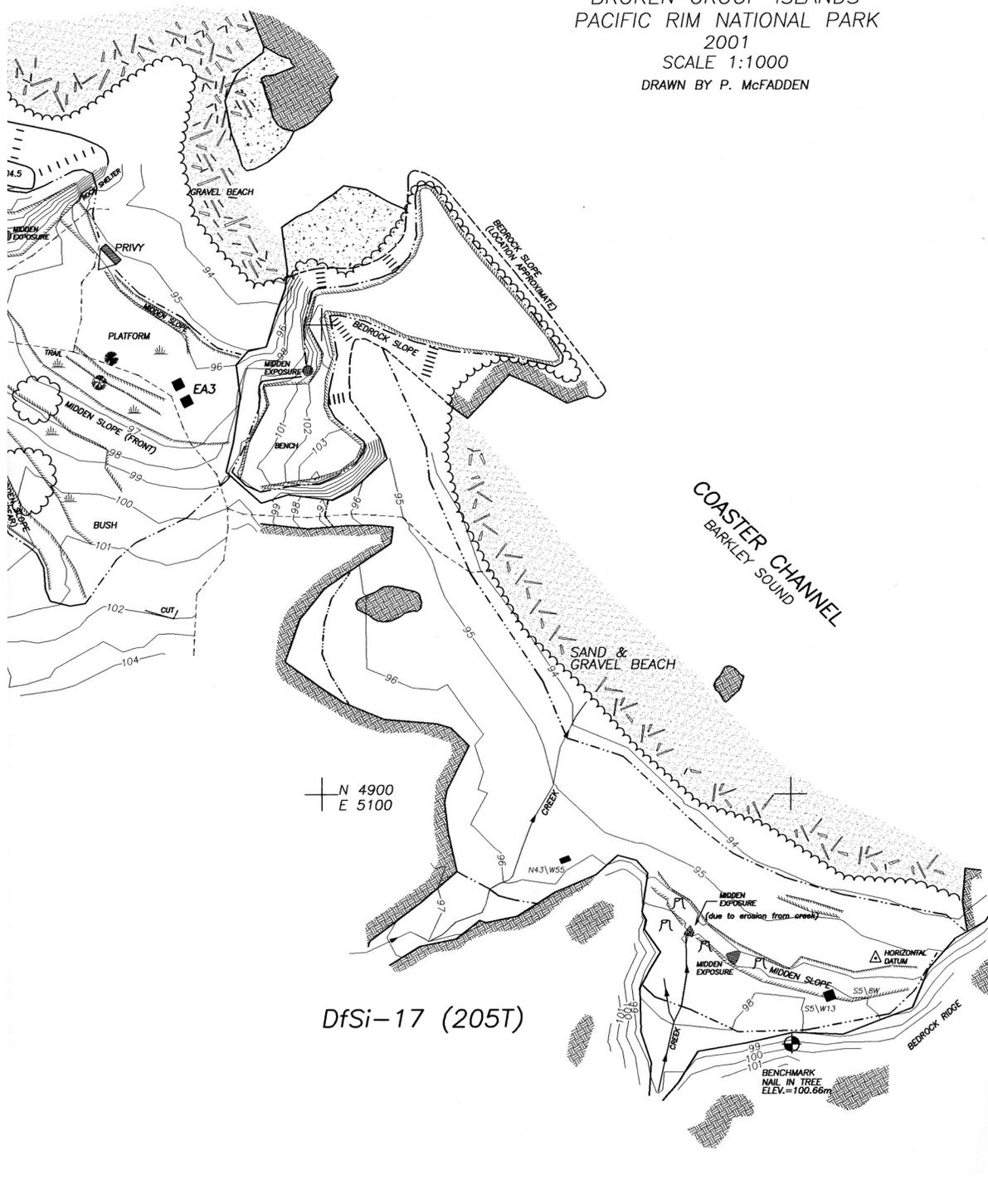
Figure 19. Contour map of Ts'ishaa (DfSi-16) and Himayis (DfSi-17), Benson Island, showing

PLAN OF SITES DfSi-16 & DfSi-17

BENSON ISLAND
BROKEN GROUP ISLANDS
PACIFIC RIM NATIONAL PARK
2001

SCALE 1:1000

DRAWN BY P. McFADDEN



locations of excavation units.

to the north, however, the base of deposit was not reached in the northern half of the reduced trench by the end of the field season. In the two units which reached the old beach level, the total depth of cultural deposits was about 3.7 m. In total, approximately 51.4 cubic metres of midden matrix were excavated from EA 1.

The 2000 fieldwork took place in the forested western portion of the site. Three flattened terraces or platforms extend across this area, one above the other in rows parallel to the beach (Fig. 19). The uppermost, which is the widest, and the middle flattened areas were interpreted as house platforms, while the lowest is perhaps an activity area in front of the houses and only slightly above the highest tide line. The first trench to be laid out in this area (EA 2) extended from the back of the highest terrace, just before the midden drops sharply down to a gully behind the main site, across the width of the platform and down the slope onto the back of the middle terrace. To avoid cutting across the slope at an angle, the trench had to be turned about 17° E of magnetic N–S alignment. The coordinates for this 18 m long trench are N 2 to S 16, W 98 to 100. However, the lowest unit on the slope (S 0 to 2, W 98 to 100) was barely begun when excavation on the trench halted. As a result, this excavation is better viewed as a 14 x 2 m trench (S 2 to 16, W 98 to 100) extending across the upper platform and down the slope below, plus a 2 x 2 m unit (N 0 to 2, W 98 to 100) at the back of the middle platform. Excavation across the upper platform was hindered by the loose shell deposits, which made it difficult to maintain vertical walls. As repeated slumps made it impossible to install the shoring equipment when the required depth was reached, this trench was abandoned at that point for safety reasons. The maximum depth reached in the trench was about 1.6 m; in all, approximately 29.8 cubic metres of deposit were removed. The 2 x 2 m unit on the middle platform was excavated to a depth of about 1.75 m, removing an additional 7.0 cubic metres. The deposits from this unit seemed much more consolidated and suggestive of house remains, leading to a decision to open a new trench across the lower platforms.

A second trench was then laid out two meters to the west, parallel to the alignment of the earlier trench. It extended across the relatively narrow middle platform and down the low slope to cross the lowest platform, almost reaching the drop-off to the highest tide line at the front edge of the site. Its dimensions were 12 x 2 m, with coordinates of N 0 to 12, W 102 to 104. The southernmost unit

(N 0 to 2, W 102 to 104) served as a “step” outside the shoring so was only partially excavated. After reaching a depth of about 1.4 m, work in this unit was reduced to the northern half, which was taken down to about 2.4 m. All five of the remaining 2 x 2 units were excavated to the original beach level. This occurred at a depth of about 3.2 m at the southern end, adjacent to the “step” unit, and 2.4 m at the north, near the drop to the beach. About 64 cubic metres of deposit were removed, bringing the total for EA 2 to about 100.8 cubic metres.

The 2001 excavations primarily focused on the older materials behind the main site. However, two 2 x 2 m units (grid coordinates S 54–56 E 33–35 and S 58–60 E 33–35) were also excavated near the eastern end of the main village area, on the lowest and broadest of two flat platforms. A slight rise at the back of this platform, dropping off again before the slope up to the higher terrace, appears to be a back midden ridge which accumulated behind where houses once stood. In addition to extending coverage across the site, this area (EA 3) was selected because previous probing had indicated that the deposits were relatively shallow and could be dug without trenching and shoring. Maximum depth was 1.5 m. About 10.8 cubic metres of deposit were excavated from the two units of EA 3.

In total, the amount of site deposit excavated at Ts’ishaa village, not counting the units on the back terrace, was about 163 cubic metres.

Excavation Methodology

A horizontal datum (0–0 point) was placed just off the northeastern edge of the site as a spike driven into the trunk of a large spruce tree in a small cluster of trees adjacent to a large rock outcrop. All unit coordinates were laid out from that point. The vertical datum was then established as a flagged spike driven into the trunk of a large spruce tree in the open area in the eastern portion of the site, directly south of the horizontal datum and east of the initial excavation trench (EA 1). Both are shown on Figure 19. The same vertical datum was used for the EA 3 excavation units. However, for EA 2, in the western portion of the site, distance from the primary datum required establishment of a secondary datum, which was marked by a flagged spike driven into the trunk of a large hemlock tree immediately west of the excavation trench on the upper terrace. As this is markedly higher than the area around EA 1, the secondary datum had to

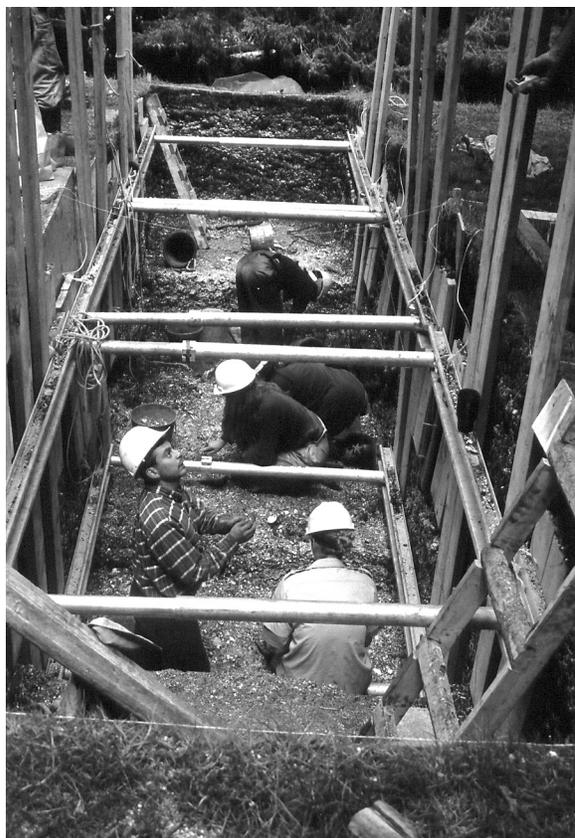


Figure 20. Excavation in progress at Ts'ishaa showing the 1999 trench (EA 1) and the shoring equipment installed for worker safety. The "step" units at each end of the trench are also evident.

be established at three metres above the primary datum; therefore all measurements between these two areas will differ by that amount. Unit datums, pegs with their tops surveyed to a depth below the main datum, were established beside each excavation unit in each of the excavation areas.

The deep and loosely consolidated shell deposits at the site required excavation in trenches, so that shoring could easily be installed for worker safety. Each trench was laid out as a series of 2 x 2 m squares, oriented in a perpendicular line to the beach. Only the central units were excavated to the base of deposits; the end units were planned as "steps," to provide access to the trench and to reduce the height of the end walls. Once the excavation reached a depth (about 1.2 m) that required safety measures, the 2 m width of the trench was braced with professional shoring equipment. Aluminum hydraulic cylinders, exerting a pressure in excess of 1000 psi, spanned

each trench. Each cylinder fitted into a horizontal aluminum "whaler" on each trench wall. The whalers held vertical 2" x 8" boards, 14' [4.2 m] in length, pressed firmly against the trench walls. As excavation proceeded, the boards were driven further down and an additional horizontal unit of two whalers and two cylinders would be added at approximately 1.2 m intervals (Fig. 20). Three levels of shoring were installed in the deepest excavation units.

During excavation, all cultural deposits were removed by trowelling in ten centimetre levels, taking care to separate materials from differing natural layers. Levels were numbered while natural layers were given alphabetical designations; both were recorded on all bags and forms. Artifacts were recorded in three dimensional provenience, while faunal remains were bagged by level and layer. All trowelled matrix was screened through 1/4" mesh. Standardized forms (based on ones obtained from the Royal B.C. Museum in Victoria) were used to record data concerning artifacts, features, and radiocarbon samples, as well as the notes for each excavated level. Profile drawings were made of the stratigraphy along one long wall of each trench, as well as the end walls. Such drawings had to be done in stages as the excavation proceeded, due to the need to keep moving the shoring boards which partially covered the walls.

Several collection strategies were employed for faunal remains. All vertebrate remains were collected and were bagged by level and layer separately from shell. All shellfish remains that were relatively complete or retained one hinge (or a portion of a hinge) were collected in the initial fieldwork. Such a large volume of shell was amassed, however, that in the 2000 fieldwork only two central units in each trench were designated for intensive shell collection. In addition, an attempt was made to compensate for loss of smaller faunal elements through the 1/4" mesh screens. Although use of smaller mesh size throughout would have been prohibitive due to the large quantity of midden excavated, smaller samples were selected for more intensive collection. In both the EA 1 and 2 trenches, a 50 cm x 50 cm block in one of the central units was designated for fine-screening (through 1/4" mesh into 1/8" mesh), resulting in much higher recovery of small fish bones. In addition, a smaller block (25 x 25 cm in EA 1; 20 x 20 cm in EA 2) was collected as a bulk column sample which was then water-screened through nested sieves (from 1/2" to 1/16") for recovery of even very small bone and shell fragments (Fig. 21).



Figure 21. Ian Sumpter (Parks Canada) sorting fine-screened elements from the bulk matrix sample.

Stratigraphy and Chronology

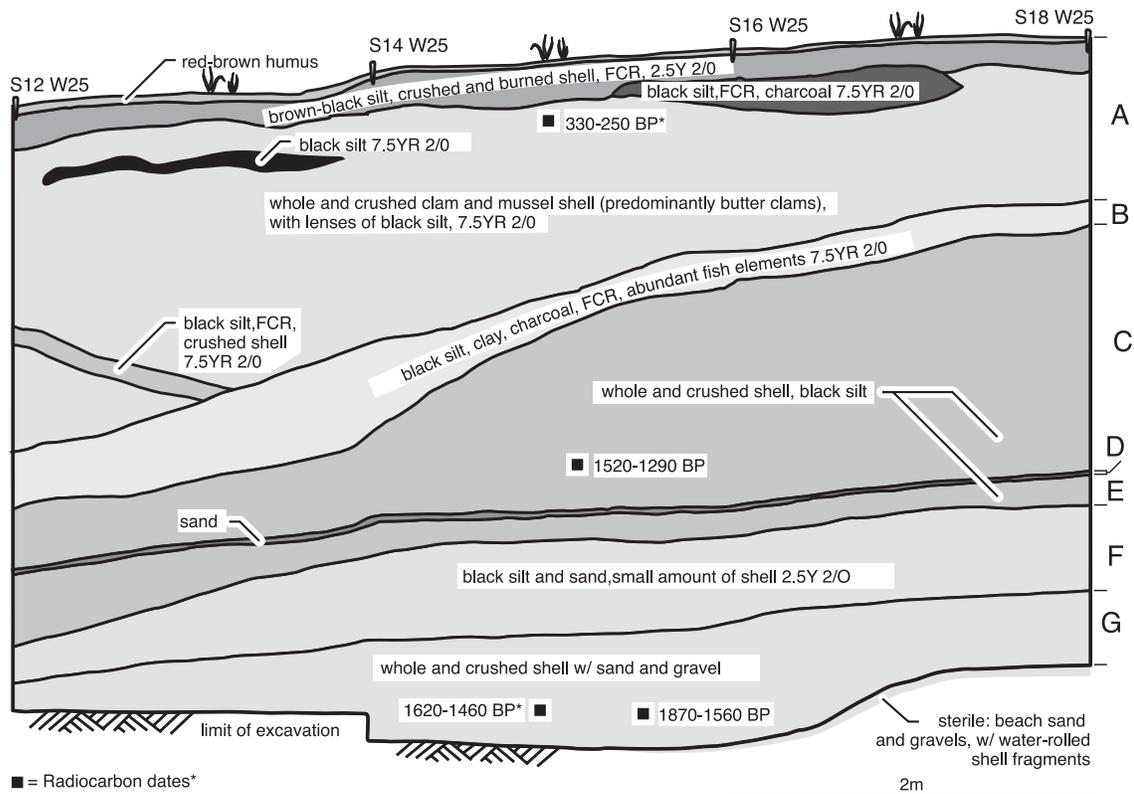
The EA 1 stratigraphy is shown in Figure 22. This depicts the profile for the east wall of the central three units of the trench (S 12 to 18, W 25), excluding the two “stepped-down” end units. Below the red-brown humus at the surface was a brown-black silty matrix (Munsell 2.5Y 2/0) with crushed and burned shell and fire-cracked rock (FCR). Below that was a thick stratum of clam and mussel shell with black silt (Munsell 7.5YR 2/0). These two upper layers were not initially distinguished in the field, so both have been designated Layer A. Underlying that is Layer B, consisting of black silt and clay with charcoal and FCR. Shell is nearly absent from this matrix, although fish bones were abundant. A thick layer of whole and crushed shell is next in the sequence. A thin layer of brown sand, labelled Layer D, divides it into two, designated Layers C and E, although they are essentially the same in composition. Layer F below consists of black silt and sand with a small amount of shell (Munsell 2.5Y 2/0). The lowest cultural stratum, Layer G, consists of whole and crushed shell in a matrix of sand and gravel. This sits directly on the

old beach surface, marked by sand and gravel with water-rolled shell fragments. This sterile beach deposit was only reached in the southern half of the trench.

Only one natural layer had been exposed on the upper terrace of EA 2 at the time excavation was discontinued in that area. The matrix was heavily concentrated whole and crushed clam shell, with some black silt (Munsell 7.5YR 2/0). Large pockets of loose whole clam shells were encountered. This type of midden material likely reflects “dump” activities and is typical of deposits found as back terraces at the rear of many village sites. However, the flat upper surface is not typical and likely represents intentional flattening, perhaps to allow an additional row of houses or other structures in the final period of village occupation. Such use may have been short-lived and is not reflected in the stratigraphy.

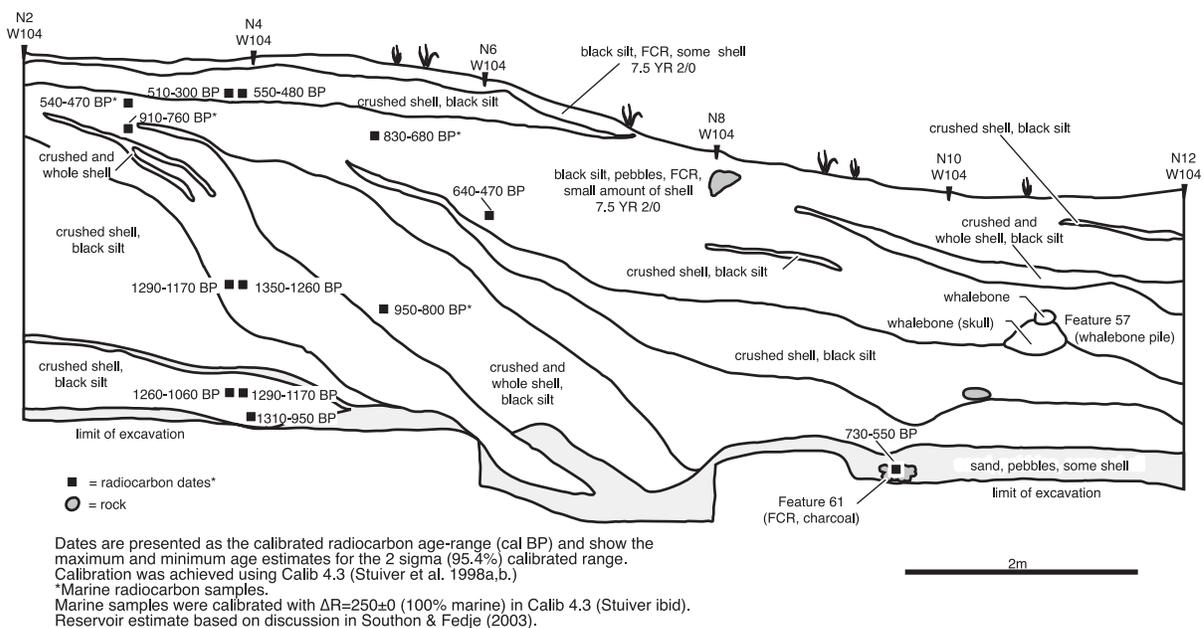
On the two lower terraces of EA 2, the strata are essentially of two types. Layers of concentrated whole and crushed shell with some black silt alternate with those of black silt (Munsell 7.5YR 2/0), pebbles, FCR, and a small amount of shell. In all units, Layers A and C consist of the latter, while Layers B and D consist of concentrated shell. The stratigraphy for the five units excavated to the base of cultural deposits is shown in Figure 23. Lower layers of crushed shell slope markedly from the middle terrace down toward the beach, suggesting that the slope from this platform was steeper at that time, prior to the accumulation of much of the deposit on the lower platform. The darker layers, with abundant FCR, occasional features such as post molds and hearths, and only traces of highly compacted shell, suggest activity areas or possible structures. At the base of the deposit are the sand, gravel, and some shell of the original beach (Layer E). Cultural materials (shell, FCR, charcoal, and a few artifacts) extend a short distance into this sandy matrix, presumably through trampling during the initial occupation.

The two units of EA 3 were similar in their stratigraphic records (Fig. 24). An upper layer of black silt and FCR (Munsell 7.5 YR 2/0) was underlain by a thick band of crushed and whole shell. Below that were layers of crushed shell mixed with ash, charcoal, and sand. Another thick layer consisted primarily of black silt, crushed shell, and small pebbles. Sand, gravel and waterworn shell marked the original beach at the base of the deposit. However, bands of dark silt, containing a small quantity of artifacts and other cultural materials, extended a considerable



Dates are presented as the calibrated radiocarbon age-range (cal BP) showing the maximum and minimum ages for the 2 sigma (95.4%) calibrated range. Calibration was achieved using Calib 4.3 (Stuiver et al. 1998a,b.)
 *Marine radiocarbon samples.
 Marine samples were calibrated with $\Delta R=250\pm 0$ (100% marine) in Calib 4.3 (Stuiver *ibid*).
 Reservoir estimate based on discussion in Southon & Fedje (2003).

Figure 22. Stratigraphic profile of the east wall of the 1999 trench (EA 1) showing radiocarbon dates.



Dates are presented as the calibrated radiocarbon age-range (cal BP) and show the maximum and minimum age estimates for the 2 sigma (95.4%) calibrated range. Calibration was achieved using Calib 4.3 (Stuiver et al. 1998a,b.)
 *Marine radiocarbon samples.
 Marine samples were calibrated with $\Delta R=250\pm 0$ (100% marine) in Calib 4.3 (Stuiver *ibid*).
 Reservoir estimate based on discussion in Southon & Fedje (2003).

Figure 23. Stratigraphic profile of west wall of main 2000 trench (EA2) showing locations for radiocarbon dates.

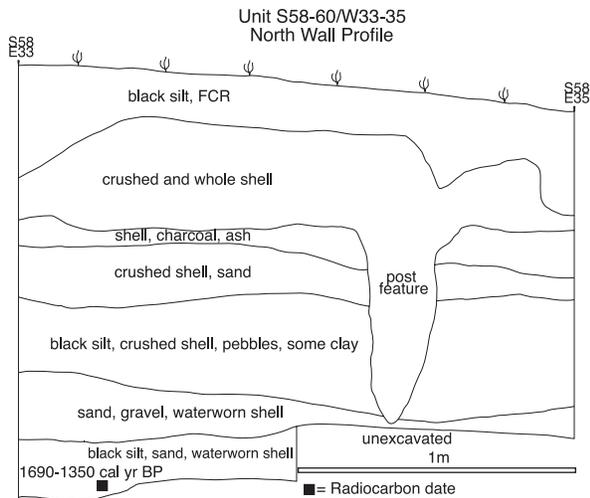


Figure 24. Stratigraphic profile for the north wall of unit S 58–60 W 33–35 in EA 3.

distance into the sand, particularly in the southernmost unit.

Radiocarbon samples of wood charcoal were collected throughout the excavation in all units. Selected samples were submitted for processing and age determination at the end of each field season. In addition, three pairs of charcoal samples were later collected from the column sample in EA 2 for precision AMS dating, along with shell from the same levels. Also, six fur seal (*Callorhinus ursinus*) bones were later selected from various locations for AMS dating; calibration of these dates takes into account the marine reservoir effect. Sample locations and results are plotted on the stratigraphic profiles (Figs. 22–24). A list of all radiocarbon dates from the village area, showing the calibrated age range (at two sigma; 95% probability), is given in Table 2.

Thirteen dates were obtained from the middle and lower terraces of EA 2, most from the southern (furthest from the beach) end of the trench (Fig. 23). Three dates from the upper layers in this area cluster in the 300 to 500 cal BP range. Just below are dates of 830 to 680 cal BP and 910 to 760 cal BP. Five dates from the lower third of the profile, representing over a metre of shell deposit, are essential contemporaneous, indicating very rapid accumulation. They suggest that the initial occupation in this area was about 1300 cal BP. Several dates from the sloping strata down to the lowest terrace are more recent, indicating that shell deposits were building toward the sea over time. A date from the base of the lowest terrace, from a hearth in beach sand, is 730 to 550 cal BP. The

later site buildup on this lowest terrace may reflect gradual emergence of the land due to tectonic forces along the coast. Overall, it would appear that this western portion of the site was not occupied until somewhat later than the central and eastern areas.

One age determination on charcoal is available for EA 3, at the eastern end of the site. A sample from the black-stained sand at the base of the deposit yielded an age estimate of 1690 to 1350 cal BP.

EA 1, in the central area of the site, has four radiocarbon age estimates, including dates slightly older than the other two site areas (Fig. 22). An AMS date on fur seal bone from an upper level provided a estimate of 330 to 250 cal BP. A charcoal date from just below the middle of the deposit, at about 2.3 m depth, gave an estimate of 1520 to 1290 cal BP. Two dates from the lowest layer, just above sterile beach sands at a depth of about 3.6 metres, are 1620 to 1460 cal BP and 1870 to 1560 cal BP. The former is based on fur seal bone, while the latter is on charcoal collected from a cluster of fire-cracked rocks designated as a hearth feature. All four dates seem consistent and the oldest is assumed to be an accurate estimate for the initial occupation in this part of the site. However, a somewhat earlier date of 2350 to 2130 cal BP was obtained by the 1995 Parks Canada crew from coring behind and west of EA 1.

Artifacts Recovered

In total, 736 artifacts have been obtained from the main village at Ts'ishaa (154 from EA 1, 528 from EA 2, and 54 from EA 3). Of these, the great majority (606; 82.3%) are of bone or antler. Only 77 artifacts (10.6%) are of stone, and most consist of a single category (abrasive stones). Shell accounts for an additional 41 artifacts (5.6%) and tooth for an additional 8 (1.1%). Introduced historic materials are represented by only three items (0.4%). Artifact categories and numbers are shown in Table 3.

Bone points, bipoints, and fragments of such tools dominate the assemblage from Ts'ishaa, as is the case for almost all excavated Nuuchahnulth sites. Although there is a considerable range in form and size, suggesting that they served a number of functions, the great majority would have been parts of composite fishing gear of various types. Collectively they total 407 objects, representing 67.2% of the bone and antler artifacts and 55.3% of the artifact total. This includes a number

Table 2. Radiocarbon dates from Ts'ishaa Main Village.

Area	Sample No.	¹⁴ C age (BP)	Cal age range (BP)*	Intercept (s)	¹³ C/ ¹² C	Material*	Lev./ Layer	Comments
EA1	CAMS-85647	895±30	330-250	280	-14.1	marine bone	4A	AMS date, near top of shell
EA1	Beta-134655	1490±60	1520-1290	1350	-25	charcoal	25C	Middle of deposit, at 2.3 m depth
EA1	CAMS-85646	2235±35	1620-1460	1530	-15.3	marine bone	37G	AMS date near base
EA1	Beta-134656	1800±60	1870-1560	1710	-25	charcoal	37G	At base of unit, 3.6 m depth
EA2	CAMS-97191	350±45	510-300	434, 350, 330	-25	charcoal	3B	Paired AMS date— top of shell layer
EA2	CAMS-97192	475±35	550-480	510	-25	charcoal	3B	Paired AMS date—top of shell layer
EA2	CAMS-85651	1145±30	540-470	510	-14.4	marine bone	5C	AMS date
EA2	Beta-147072	500±60	640-470	520	-25	charcoal	10C	Middle terrace, 1.2 m depth
EA2	Beta-147075	690±60	730-550	660	-25	charcoal	25E	Lowest terrace, base of deposit, 2.4 m
EA2	CAMS-85649	1470±30	830-680	750	-14.4	marine bone	7C	AMS date
EA2	CAMS-85650	1545±30	910-760	850	-14.6	marine bone	7C	AMS date
EA2	CAMS-85648	1595±35	950-800	910	-13.4	marine bone	21D	AMS date, shell layer, 2.2 m depth
EA2	Beta-147074	1230±90	1310-950	1170	-25	charcoal	31E	Middle terrace, base of deposit, 3.1 m
EA2	CAMS-97203	1385±35	1350-1260	1290	-25	charcoal	20D	Paired AMS date from column sample – 2 m depth
EA2	CAMS-97204	1300±35	1290-1170	1260	-25	charcoal	20D	Paired AMS date from column sample – 2 m depth
EA2	CAMS-97197	1310±35	1290-1170	1260	-25	charcoal	30D	Paired AMS date from column sample – near base of deposit, 3m depth
EA2	CAMS-97198	1230±35	1260-1060	1170	-25	charcoal	30D	Paired AMS date from column sample – near base of deposit, 3 m depth
EA3	Beta-158746	1620±60	1690-1350	1530	-25	charcoal	14+E	From sand at base of deposit, 1.5 m
core	CAMS-28075	2260±50	2350-2130	2330, 2220, 2210	-25	charcoal	---	AMS date from bottom of 1995 auger test at back of midden

*Dates are presented as the calibrated radiocarbon age-range (cal BP) and show the maximum and minimum age estimates for the 2 sigma (95.4%) calibrated range. Calibration was achieved using Calib 4.3 (Stuiver et. al. 1998a,b).

*Marine samples (all fur seal [*Callorhinus*] bone) were calibrated with AR=250±0 (100% marine) in Calib 4.3 (Stuiver et. al. 1998a,b). Reservoir estimate is based on discussion in Southon and Fedje (2003).

of tip fragments, some of which could have come from other tool types, such as awls.

The number of artifacts recovered is relatively low for the size of the excavation (4.5 artifacts per cubic metre of deposit removed). This is particularly evident for EA 1 (3.0 artifacts per m³) and the upper terrace of EA 2 (4.1 per m³). In both cases, the low number of artifacts and features, plus the great quantity of shell and its lack of compaction, suggest that these were “dump” areas where mollusc shells and other refuse were discarded. The units on the two lower terraces of EA 2 had higher artifact densities (5.7 per m³), with dense black layers suggesting house or activity areas.

The relative paucity of artifacts recovered from Ts'ishaa is particularly evident through comparison

with other excavated Nuu-chah-nulth sites. The major village of Yuquot in Nootka Sound yielded approximately 17.9 artifacts per cubic metre of deposit, even excluding the numerous artifacts of European materials in the historic component (Dewhurst 1980). The closest comparisons would be with the excavated Toquaht sites, just a short distance from Ts'ishaa on western Barkley Sound (Fig. 1). T'ukw'aa, originally the main village of the Toquaht and therefore equivalent to Ts'ishaa, yielded 13.3 artifacts per m³, again excluding the relatively numerous historic items of European manufacture. The figure for Ch'uumat'a, a major village nearby, is 6.5 artifacts per m³ of deposit, while Ch'uuch'aa, a lookout site on the George Fraser Islands, had 17.2 per m³ (McMillan and St. Claire 1992, 1994, 1996).

Artifacts are classified by raw material, then by form or presumed function. The number of examples in each category is given after the heading. All measurements, given in centimeters, are the maximum for that attribute, unless otherwise specified. Parentheses on a measurement indicate that the object is incomplete in that dimension. Wherever possible, some discussion is given of the archaeological distribution of each artifact category and the ethnographic use of similar objects within Nuu-chah-nulth territory and surrounding areas.

Artifacts of bone and antler

Bone points (112) At least two distinct categories of relatively small unbarbed bone points can be discerned. One (“abrupt tip”) is characterized by greatest width near the tip and sides that gradually taper to the base (Fig. 25, lower row). A total of 37 points falls within this category. Such points

tend to be quite stout, with 18 of the total being round or nearly so in cross-section while the rest are flattened. Bases take a range of forms; several are wedge-shaped, a few come to a blunt point, and a number of those round in cross-section have round flattened bases. Most have been fashioned from sections of hard land mammal limb bone, although three are of sea mammal bone. One charred and blackened example is based on the intact limb bone of a small mammal that has been extensively worked over its entire surface and ground to a sharp point. Size varies considerably, from several quite large examples to one that is very small. Measurements are summarized in Table 4. The variation in form and size suggests that these objects served several different functions. Most, however, would likely have been used as arming points in composite toggling harpoon heads. Many fit quite comfortably into the excavated toggling harpoon valves from the site although a few seem

Table 3. Artifacts from Ts’ishaa (DfSi-16) – Main Village.

	EA1	EA2	EA3	total
Bone & Antler				
Bone points				
abrupt tip	16	21	–	37
gradual taper	9	23	1	33
small wedge-based	3	3	3	9
unidentified frag	8	24	1	33
Barbed bone points	3	2	2	7
Bone bipoints	20	170	–	190
Tips of pointed bone tools	13	82	3	98
Awls				
deer ulna	1	1	1	3
deer metapodial	1	–	–	1
land mammal bone splinter	2	8	3	13
bird bone	–	4	3	7
Harpoon valves	8	14	6	28
Harpoon foreshafts	1	2	–	3
Chisels	1	6	–	7
Comb	–	1	–	1
Pendants/drilled bone	2	7	–	9
Bird bone tube	–	1	–	1
Small rectangles (net gauges?)	–	3	–	3
Wedges	–	5	–	5
Bark shredder frags.	1	1	–	2
Straight adze handle (?)	1	–	–	1
Harpoon preforms	2	–	–	2
Crude whalebone club	–	1	–	1
Worked whale bulla	–	1	–	1
Misc. worked bone (excl. whale)	14	26	3	43
Misc. worked whalebone	16	36	1	53
Misc. worked antler	2	12	1	15
(total)				606 82.3%

	EA1	EA2	EA3	total
Stone				
Chipped biface	–	–	1	1
Chipped phyllite chopper	–	–	1	1
Obsidian flake	1	–	–	1
Chipped and ground schist knife	1	–	–	1
Ground stone point	–	–	2	2
Notched pebble (sinker?)	–	1	–	1
Jet pendant	1	–	–	1
Celt preforms (?)	1	2	–	3
Fishhook shanks	–	3	–	3
Hammerstones	2	3	1	6
Abrasive stones	10	43	5	58
(total)				78 10.6%
Shell				
Mussel shell harpoon blade	–	1	–	1
Misc ground mussel shell	9	9	–	18
Dentalium shells	2	1	3	6
Olivella shell beads	–	3	10	13
Clam shell disc beads	1	–	–	1
Clam shell ochre bowl	–	1	–	1
Perforated scallop shell	–	1	–	1
(Total)				41 5.6%
Tooth				
Worked canines	1	4	1	6
Elk tooth pendant	–	1	–	1
Beaver incisor tool	–	1	–	1
(total)				8 1.1%
Historic Materials				
Iron fragments	1	–	–	1
Glass bottle frags.	–	–	2	2
(total)				3 0.4%
Grand Total	154	528	54	736

Table 4. Abrupt tip bone points – Ts’ishaa Village.

<i>attribute</i>	<i>range</i>	<i>mean</i>	<i>S.D.</i>	<i>No.</i>
length	1.8 to 6.6 cm	3.80 cm	0.76 cm	30
width	0.3 to 0.9 cm	0.68 cm	0.12 cm	37
thickness	0.2 to 0.8 cm	0.51 cm	0.13 cm	37

too stout and bluntly pointed to have served such a function.

Of the remaining points, 33 have been classified as “gradually tapering” (Fig. 25, upper right). These are roughly bipointed although one end is more blunt than the other; greatest width is below the centre, closest to the blunt end. Most correspond to Dewhirst’s (1980) “spindle-shaped” category for Yuquot. The 21 complete examples from Ts’ishaa vary considerably in length, from 2.8 to 9.9 cm. Measurements are shown in Table 5. All but one are made from splinters of land mammal bone; the exception is a section of intact sea mammal limb bone (tentatively identified as a fur seal fibula) which has been extensively ground and sharpened to a point at its intact end. Most in this category would have functioned as barbs in composite fishing hooks of various sizes. One eroded example is notched and worn just below the mid-point, possibly as a result of hafting onto

Table 5. Gradually tapering bone points – Ts’ishaa Village.

<i>attribute</i>	<i>range</i>	<i>mean</i>	<i>S.D.</i>	<i>No.</i>
length	2.8 to 9.9 cm	4.89 cm	1.47 cm	21
width	0.3 to 0.8 cm	0.52 cm	0.09 cm	33
thickness	0.3 to 0.6 cm	0.39 cm	0.07 cm	33

the shank of the hook; no other evidence of lashing was noted.

Nine additional small points, all of land mammal bone, range in length from 2.8 to 3.9 cm (mean=3.23 cm; S.D.=0.27 cm). Six are distinctly wedge-based while three are narrowed on several facets down to the base. These probably also served as barbs on very small fishhooks.

Another 33 artifacts are fragments of bone points that are too incomplete to categorize further. These are primarily base and mid-section fragments. Except for a few that could easily be recognized (such as those from abrupt tip points), tip fragments could have come from a variety of pointed bone artifacts and are listed separately. All are of land mammal bone. Several long stout fragments clearly came from artifacts that were considerably larger than any of the complete points in the collection. Only a few are relatively slender fragments from smaller bone points.

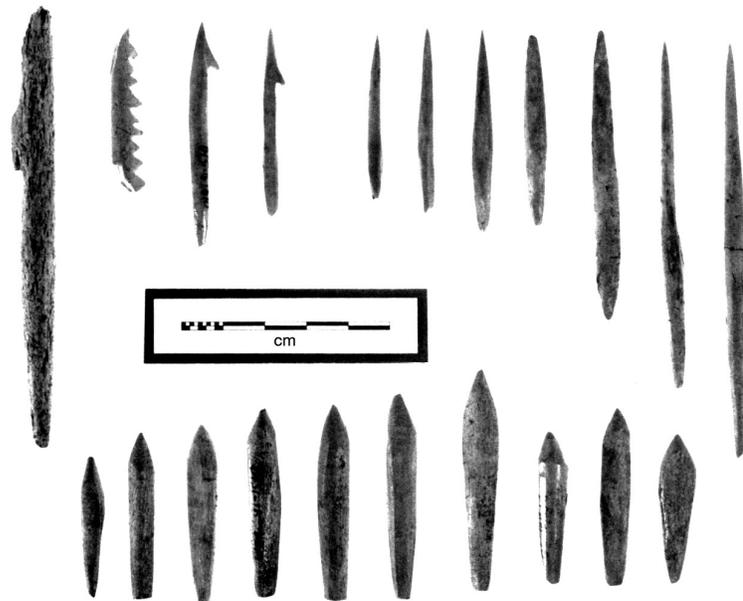


Figure 25. Bone Points from Ts’ishaa (upper left – barbed points; upper right – gradually tapering points; lower row – abrupt tip points).

Barbed bone points (7) A distinct sub-category consists of small points of land mammal bone with a single barb near a sharp tip (Fig. 25, top left). Three complete examples, with lengths of 4.6, 5.0, and 5.6 cm, came from Ts'ishaa (one from each of the three excavation areas). They are oval to round in cross-section. In two cases the base is bluntly pointed, while the third has a flat circular base. Such points likely armed composite fishhooks which had shanks of wood or bone. Drucker (1951: 22) describes a hook for catching cod or trolling for salmon as having a point "which was a barbed splinter of hardwood or bone." Jewitt (1967: 68), at Nootka Sound from 1803 to 1805, described the fishhooks in use there as "a straight piece of hard wood, in the lower part of which is inserted and well secured, with thread or whale sinew, a bit of bone made very sharp at the point and bearded [barbed]." Similar artifacts were found at Yuquot (Dewhirst 1980: 178–81), Shoemaker Bay II (McMillan and St. Claire 1982: 102–3), the Ozette midden trench (McKenzie 1974:93), and at both T'ukw'aa and Ch'uumat'a (McMillan and St. Claire 1992, 1996). They are considered to be one of the characteristic artifacts of the West Coast culture type (Mitchell 1990: 356).

The remaining four examples, although all fragmentary, appear to have been larger unilater-

ally barbed fixed bone points. The most complete, of sea mammal bone, is round in cross-section with a tapering round base (Fig. 25, left). Although most of the tip portion is missing, it retains one low barb. This fragment is 10.7 cm long, with a diameter of 0.9 cm. Another is a broad flat tip fragment, clearly from a much larger artifact, which retains evidence of one barb although much of it has broken away. A second tip fragment also shows evidence of one barb which has largely broken away, although this was clearly from a smaller implement. The final object is a small mid-section with nine closely-spaced barbs remaining on one side. Unilaterally barbed fixed points were common at Yuquot, where Dewhirst (1980:282) suggests that they armed arrows. They are a characteristic trait of Mitchell's (1990: 356) West Coast culture type.

Bone bipoints (190) Bone bipoints, splinters of bone with both ends sharply pointed, comprise the largest single artifact category found at Ts'ishaa (Fig. 26). A total of 190 were found, most of which came from EA 2. The 111 complete examples range in length from 2.1 to 6.6 cm (mean=4.4 cm; S.D.=0.76 cm). Most (135) are slender objects of bird bone. The remainder are stouter, in a few cases markedly so; these are generally of land

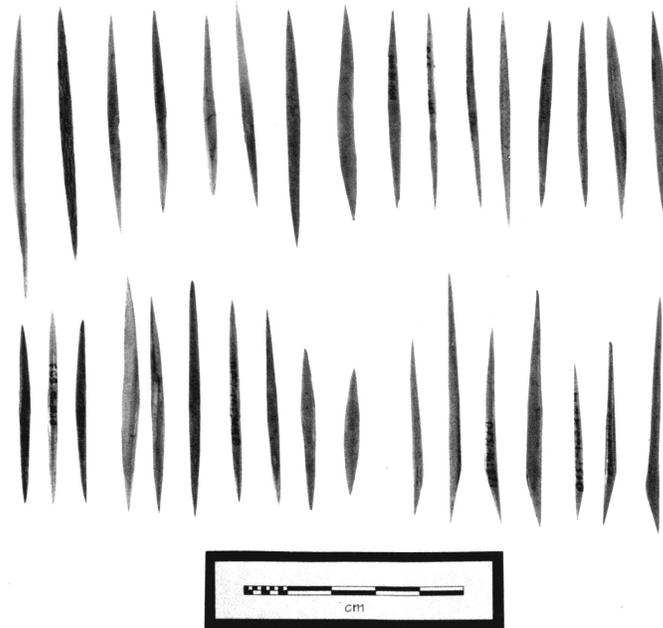


Figure 26. Bone bipoints from Ts'ishaa (scalene examples at lower right).

mammal bone, although several are from sea mammals. Although most have their greatest width at their centre, 29 examples, all but one slender bird bone bipoints, are markedly asymmetrical, taking the form of an elongated scalene triangle. Similar “scalene” objects also occur among the Yuquot gorges (Dewhirst 1980: 220–1).

Many of these sharpened splinters of bone would have been used as gorge hooks. Ethnographically, such objects were baited and tied, and used not only for taking fish but also aquatic birds. Drucker (1951: 34) describes a trap used by the Nuu-chah-nulth for catching diving waterfowl as consisting of many baited bone gorges tied to an anchored pole. Dewhirst’s (1980: 210–1) Nuu-chah-nulth respondents at Nootka Sound also confirmed the use of such artifacts to take both fish and birds. However, only one of the Ts’ishaa bipoints is markedly “waisted” or indented at the centre for line suspension.

Bone bipoints are common at all excavated Nuu-chah-nulth sites. Their high frequency here (25.9% of the artifact total) compares most closely with T’ukw’aa (24.5%) and the Ozette midden trench (33.7%) (McMillan 1999:174).

Tips of pointed bone tools (98) Sharpened fragments of bone were commonly encountered in the Ts’ishaa midden deposits. A range of sizes and materials suggest that they came from a variety of

pointed bone tools. Most would have been from bone points of various forms, but others would have come from bipoints, awls, or other artifact types. The majority are of land mammal bone, although sea mammal bone and bird bone are also represented. Some quite large and stout examples are generally oval to rectangular in cross-section. Others are more slender and round in cross-section. The latter, along with a number of small sharpened bird bone splinters, are likely from slender bipoints, used as gorges, of which only one end has been recovered.

Ten very small pointed bird bone objects were found in a cluster on the upper terrace of EA 2. Of these, six are fragments with only one end remaining and are included here. The other four are complete or nearly so, allowing classification as bipoints. It is likely that all ten were small bipoints. Their discovery together indicates some form of fishing gear, possibly a line with a series of small gorges attached.

Awls (24) Bone awls are of several distinct types. This category has been divided into deer ulna awls, deer metapodial awls, land mammal bone splinter awls, and bird bone awls (Fig. 27). Such tools are commonly encountered in Nuu-chah-nulth sites; bone splinter awls and deer ulna tools are specifically identified as characteristics of the West Coast culture type (Mitchell 1990).



Figure 27. Bone awls from Ts’ishaa (from left: two bird bone awls, four land mammal bone splinter awls, one deer metapodial awl, and two deer ulna tools).

Two deer ulna tools, 10.2 cm and 10.3 cm in length, are complete. On one, the unmodified distal end is missing the epiphysis, indicating that it was made from the ulna of an immature deer. The proximal end has been sharpened to a flattened, fairly broad, blunt point, with extensive grinding striations still evident. The sides near the tip are flattened, indicating that it was used as an awl rather than as a knife. The other, based on a mature deer ulna, has considerable polish over its entire surface, including the base. The sharp polished tip is oval in cross-section. Three closely-spaced shallow grooves are visible near the tip on one side. A nearly identical tip fragment is also placed in this category. This sharpened, highly polished tip, oval in cross-section, has two pronounced grooves along one side near the tip. As this is where the break occurred, there may originally have been additional grooves. Such distinctive wear possibly suggests that these were used as weaving implements. Similar wear is seen on ulna tools from Yuquot (Dewhurst 1980: 143–5), Hesquiat Village (Haggarty 1982: 125), and Shoemaker Bay II (McMillan and St. Claire 1982: 105).

Another complete example, 6.7 cm in length, is based on the distal portion of a deer metatarsal. It retains the complete unmodified articular surface at the base. The shaft of the bone has been cut at an angle, then extensively ground on flat facets to produce a blunt tip that is nearly square in cross-section.

Thirteen awls are based on splinters of land mammal bone. Each has one end worked to a sharp point, while the base of the artifact remains rough and unshaped. Three large examples were made from long sections of land mammal limb bone, with some of the natural curvature intact on the object's width. The largest has a long tapering tip from an irregular base, which appears polished through use; it is broken into several non-joining pieces but would have been greater than 14.2 cm in length. Another, complete at 9.6 cm in length, has been worked at one end to a sharp rounded tapering point. The third, (10.1) cm long, is missing only a small area at the tip, which is long, round in cross-section, and gradually tapering, resembling a drill. The tip of a small fragment is also round in cross-section and gradually tapering, flaring out to a rough base. Complete examples of the nine additional splinter awls range in length from 3.8 to 7.0 cm. Five are markedly asymmetric, with the tip at the end of one side.

Of the seven bird bone awls, four are based on intact segments of bird limb bone cut and ground

at an angle to produce a sharp point. All have an intact tip but are broken at their base. The longest fragment is 6.2 cm. Diameters are 0.3, 0.4, 0.4 and 0.8 cm. Such implements are usually classified as awls, although Dewhurst (1980:190) considers similar slender examples from Yuquot to have been arming points on composite fishhooks. Three others are based on splinters of bird bone which have been sharpened at the tip but less carefully finished at the base.

Harpoon valves (28) All are parts of composite harpoon heads. Considerable variability in size and form is evident (Figs. 28, 29). Although most are a size that would suggest use in fishing for salmon, several larger examples may have been used for seals or other sea mammals. The 28 artifacts in this category are divided into channelled (11), slotted (5), self-armed or ancillary (3), large (3), and unclassifiable fragments (6). Sea mammal bone, land mammal bone, and antler were all used as raw materials in their manufacture.

Channelled valves comprise the largest category. Rounded channels are evident in both the upper and lower portions of the ventral face on these valves. Lashing to a nearly-identical companion valve would result in a harpoon head with a round open-ended channel at the upper end, which would hold a bone arming point that was round in cross-section (similar to many of the abrupt tip examples). The lower channels formed a socket for insertion of the harpoon foreshaft. Most valves in this category are fragmentary, but still display parts of both channels. Four complete valves vary considerably in size. The largest (7.1 x 1.3 x 0.9 cm) has a deep rounded point channel (2.8 cm long) that would have held a substantial round bone arming point. On the curved dorsal surface, a shallow groove crosses the centre of the artifact, above which the bone is eroded and a different colour than the base, marking the area that was wrapped with binding that held the two valves and associated point in place. A similar but smaller valve (4.7 x 1.1 x 0.8 cm) has a deep rounded point channel (1.8 cm in length) and a whittled area on the upper dorsal face which may be associated with binding. This object seems typical of the size used for harpooning salmon, and many of the fragmentary examples are very similar in size. Finally, two very small valves (3.8 x 1.0 x 0.7 and 4.4 x 0.9 x 0.5 cm) have, unlike most in this category, small shallow channels that would have held small flattened bone arming points.

An additional five valves are of the slotted vari-



Figure 28. Harpoon valves from Ts'ishaa (top row – four channelled valves, two large slotted valve fragments; bottom row – four slotted valves, one ancillary valve, one incised valve fragment).

ety. All are characterized by a stepped flat surface as a point bed at the upper end of the ventral face. This would have held a flat arming point, such as a wedge-base bone point or possibly a broader point ground of mussel shell. Two complete composite harpoon heads, with very similar slotted valves and large wedge-based bone points were found intact in Shoemaker Bay I deposits (McMillan and St. Claire 1982:81). Except for the shape of the point bed, these closely resemble the previous category. All are similar in size, with the three complete examples being 4.8, 4.8, and 5.8 cm in length (with point beds that are 1.6, 1.7, and 1.9 cm in length).

Three artifacts are thought to have been parts of two-piece harpoon heads, which consist of one self-armed valve and one ancillary valve. None in this category have channels, but their shape and curvature suggest use as valves. One small example (3.4 x 0.6 x 0.3 cm) has a sharp point and a rounded wedged base. Its curvature suggests that this was a self-armed valve, which would have been paired with a very small ancillary valve to form a small harpoon head. A similar artifact, measuring (3.9) x 0.7 x 0.4, is missing a small area at its tip, but is also identified as a self-armed valve. Another example (4.2 x 0.8 x 0.4 cm) has a squared and flattened upper surface, as well as

the typical flaring blunt tip at the valve's lower end. It is identified as an ancillary valve, which would have been paired with a longer pointed valve. Similar examples were common at Yuquot (Dewhirst 1980:233–249), and have been identified at Hesquiat Village (Haggarty 1982:124) and other Nuu-chah-nulth sites.

Three fragmentary examples, all of sea mammal bone, are clearly from larger harpoon heads. Unlike the previous categories, which were primarily parts of salmon fishing gear, these were likely used in hunting sea mammals such as seals and sea lions. The largest fragment, (7.5) cm in length, is slotted on the upper ventral face to create a flat bed 1.8 cm in length. This would have held a broad cutting blade of ground mussel shell, which would have been held in the slot with spruce gum and tightly wrapped in place. It is broken toward the base, at the top of the channel for the shaft socket. On the dorsal face this object is markedly “stepped” and indented at the sides below the blade slot, presumably to hold the binding in place. A second object is only a small fragment from the upper end of a similar valve, showing a flat ventral face and a marked “stepped” projection around the upper dorsal surface. Similar artifacts were excavated at Yuquot (Dewhirst 1980:302–3), Hesquiat Village (Haggarty 1982:124), T'ukw'aa (McMillan and

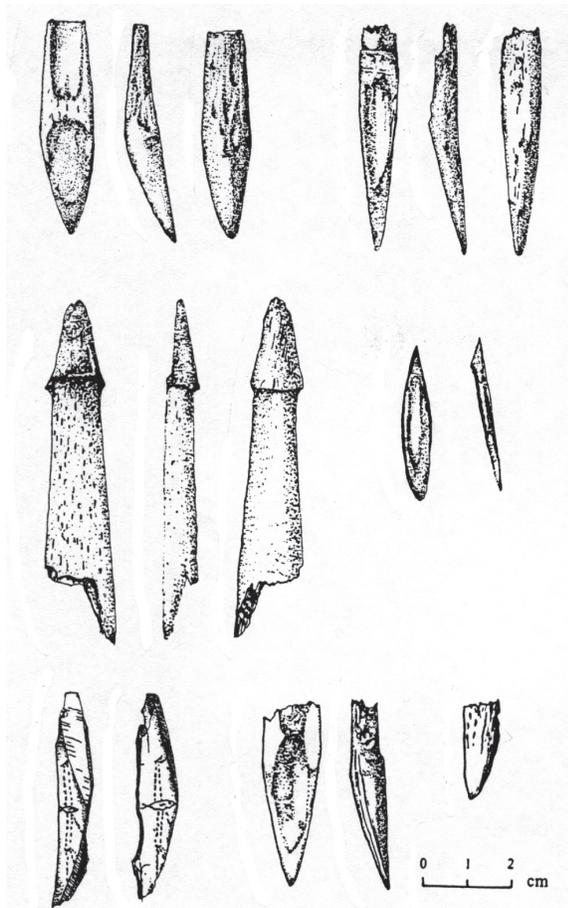


Figure 29. Harpoon valves from Ts'ishaa (upper row – channelled valve, slotted valve; middle row – large slotted valve, small self-armed valve; lower row – incised valve fragments.

St. Claire 1992: 46), and Ch'uumat'a (McMillan and St. Claire 1996:40). The third fragment is only a small portion of what appears to be the wedge-like distal end, with a flat ventral face and the break at the beginning of one channel.

Six fragments are too incomplete to classify. All come to a blunt point and appear to be the lower end of the valve. Only one retains evidence of a channel, which would have been part of the foreshaft socket. All are small and may be associated with salmon fishing.

Bone and antler harpoon valves are found in archaeological sites all along the Northwest Coast. Mitchell (1990:356) lists "large and small composite toggling harpoon valves of bone or antler" as a characteristic feature of the West Coast Culture Type. They are common at Nuuchahnulth sites such as Yuquot, where self-arming valves

dominate the earlier periods and are gradually replaced by channelled valves in more recent levels (Dewhurst 1980). Channelled valves also are the most common type in the western Barkley Sound sites of T'ukw'aa and Ch'uumat'a (McMillan and St. Claire 1992:46–47; 1996:37). Drucker's (1951:20) illustration of a Nuuchahnulth salmon harpoon head shows two channelled valves and a rounded bone point.

Three fragmentary valves display parts of incised designs on their remaining outer surfaces (Fig. 29). The most elaborate of these designs is on a small segment that has split lengthways, yet is complete in length at 4.5 cm. A design along the intact lateral edge consists of a central lenticular shape, perpendicular to the long axis of the object, with two long extensions from it, forming an image that resembles a long-winged bird. A paired design would have extended along the other side of the valve, which has broken away, leaving only two lines joining near the base of the artifact. The images are formed by short punctates or dashes, joined by shallow lines. Two parallel rows of such punctates or dashes are also evident on a small valve end fragment, which has split lengthways as well. The third decorated object is the lower half of a channelled valve which has two parallel lines, formed by overlapping incisions, along each lateral edge, extending to the pointed base. Ethnographically, the valves on whaling harpoons were frequently incised with zigzag punctate designs representing the *hiy'itl'iik*, or Lightning Serpent. Drucker (1951:28) comments that such designs were thought to have "magical virtue," enhancing the power of the harpoon. None of the three Ts'ishaa examples are sufficiently large for use in whaling, but the "magical virtue" may have extended to hunting smaller sea mammals and to fishing with harpoons.

Harpoon foreshafts (3) All are of sea mammal bone. The most definite example is oval in cross-section, with straight, gradually converging sides and a blunt rounded tip (Fig. 34). Broken at its base, this fragment is 13.7 cm long. A small medial fragment from near the distal end is similarly oval in cross-section with straight tapering sides. The third example, measuring 19.3 cm in length although it is missing the proximal end, is somewhat different (Fig. 34). It has flat faces and beveled sides, giving it a hexagonal cross-section. The end is flattened and rounded; it may possibly have served as a prying tool, as might be used in collecting shellfish, rather than as a harpoon foreshaft.

Objects very similar to these are reported for Yuquot (Dewhirst 1980:226–9). A complete example, measuring 35 cm in length, was found as a grave inclusion at Ch'uumat'a (McMillan and St. Claire 1996: 23). Sea mammal bone foreshafts are listed by Mitchell (1990:356) as one of the identifying features of the West Coast culture type.

Chisels (7) The only complete example, measuring 7.8 x 2.4 x 1.7 cm, is made from an elk (or wapiti, *Cervus elephas*) metapodial (Fig. 30). It has been split lengthways and extensively worked, with the articular surface at the butt end ground flat and the sides highly polished for their entire length. The bit end has been bevelled and polished from both faces. At one point, heavy use resulted in a segment being split off from one side of the bit, which was then re-ground and polished, reducing the bit width to only 0.7 cm.

The others, all incomplete, are also made from dense land mammal bone. Two large fragments, both split lengthways through use and missing their butt ends, appear similar to the above example. In one case the bone is so thick that it must also be elk, rather than deer. Remaining surfaces are polished and the bits, bevelled from both faces, are slightly curving. Three other small fragments are from the bit ends of such tools. Each of these highly polished fragments has also split lengthways, presumably through heavy use. The final example is a curving bit fragment, although it is less polished and less sturdy than the others and possibly may be the wedge-shaped base of a different type of artifact.



Figure 30. Bone chisels and small bone rectangles from Ts'ishaa.

Comb (1) A complete comb, measuring 10.3 x 3.2 x 0.7 cm, is made from sea mammal bone (Figs. 31, 32). All six teeth are present, although the upper portions of several have been only partially cut through the bone. An incised line encircles the object above the teeth, cutting into each side to produce shallow notches. The upper portion of the comb is carved in an unusual, slightly asymmetric, outline design. Two pronounced notches on each side and a large “U-shaped” depression on the top create “eared” projections at the upper corners of the artifact. This comb is fairly recent, as it came from the middle terrace of EA 2, in the same layer as, but well above, a radiocarbon age of 640 to 470 cal BP.

Although bone or antler combs are not common in Nuu-chah-nulth sites, they are reported for three of the Toquaht sites (McMillan and St. Claire 1992: 50; 1994: 26, 39). They were also found at Ozette, in both the midden trench and the preserved house deposits (McKenzie 1974: 71; Kent 1975).

Pendants/drilled bone (9) A complete proximal phalanx, 6.2 cm in length, from a fur seal (*Callorhinus ursinus*) has been biconically drilled near the proximal end, presumably for suspension as a pendant (Fig. 32). Slight polish is evident over its surface. Perforated sea mammal phalanges were also found at Yuquot (Dewhirst 1980: 317).

One fragmentary but finely carved object of sea mammal bone resembles a miniature club (Figs. 31, 32). Only the upper portion is present. Above the shaft, which is a rounded rectangle in cross-section, is a flattened drilled and incised area that has broken away at its edges. One drilled hole

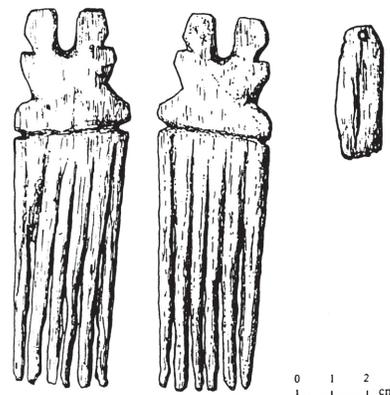


Figure 31. Decorative bone objects from Ts'ishaa (left – comb; right - pendants).



Figure 32. Bone and tooth decorative items from Ts'ishaa (left – bone comb; upper row – bone pendants; lower row – elk tooth pendant, worked canines).

is still largely intact on one side, while traces of two others are evident at the top and other side. Portions of a shallowly incised chevron design can be seen above the intact hole.

Two other pendants are complete. One, made from a curving piece of sea mammal bone, takes the form of an elongated rectangle with one rounded and one squared end (Figs. 31, 32). Near the rounded end is a drilled hole; two slight notches are also evident on one side near this end. A fairly deeply incised line runs down the centre of the object from the drilled hole to the squared end. Its dimensions are 3.7 x 1.3 x 0.3 cm. The second is a small, highly-polished section of dense land mammal bone. It is tear-shaped in outline, with the narrow end indented from each side for suspension, presumably as a small pendant. Its measurements are 2.6 x 1.0 x 0.3 cm.

Two additional objects appear to be proximal ends of pendants. Both are flattened elongated forms with straight upper surfaces and notches on their upper sides for suspension. The larger, of sea mam-

mal bone, would have had two notches on each side near the upper end, but one upper corner has broken away (Fig. 32). The other, of land mammal bone, has two notches on one side and a single notch on the other, both near the upper surface.

The remaining three are small fragmentary objects, each with a small drilled hole. Two are flat pieces of land mammal bone with a drilled hole near one end. The other is a portion of a small mammal vertebral epiphysis which has been flattened on the inner surface and a small hole drilled near one edge. The function of these objects is uncertain, although all could have been worn as pendants.

Bird bone tube (1) This polished fragment of bird limb bone is 0.7 cm in diameter. The intact end has been cut flat and polished over its surface. Similar objects were used ethnographically as drinking tubes.

Small rectangles (net gauges?) (3) Two of the three objects in this category have been cut from thin flat

mammal bone, presumably scapula, most likely of deer (Fig. 30, upper right). The largest, measuring (5.0) x 2.4 x 0.2 cm, has been broken at one end. All intact edges have been polished flat. The second is complete, measuring 3.6 x 1.6 x 0.15 cm. Both sides and one end have been polished to a smooth surface. The other end shows an incised line on both faces where the object was partially cut and then snapped. However, it did not break cleanly across the cut line and this end was left unpolished and rather jagged.

The remaining example, of sea mammal bone, is a very small rectangle with straight ends and slightly concave long sides (Fig. 30, lower right). One face and all edges have been ground flat; the other face is slightly concave, with a noticeable “lip” along each side. It is complete, measuring 2.2 x 1.4 x 0.3 cm.

Although the function of these objects cannot be determined conclusively, small rectangles of bone are often classified as net gauges. A number of bone rectangles, most commonly of sea mammal bone, came from Yuquot (Dewhirst 1980:165–7). Other examples came from Ch’uumat’a (McMillan and St. Claire 1996: 42). Stewart (1973: 123) illustrates several such objects from archaeological sites in the lower Fraser River area. She notes that they are commonly cut from deer scapulae, but can also be of sea mammal bone or antler.

The smallest example, however, may have had a different function. Similar small rectangles with concave inner surfaces were found at Yuquot, where they were identified as valves in composite whistles (Dewhirst 1980: 231–3). They were used in pairs, which were tied together and concealed in the mouth. Dewhirst’s Nuuchah-nulth informants readily identified the examples from Yuquot as whistles and stated that such objects were used in the important *Thukwana* (Wolf Ritual) ceremony. Similar items, also identified as whistle valves, came from the Ozette midden trench (McKenzie 1974: 76).

Wedges (5) Four wedges are made from whalebone and one is from antler (Fig. 33). Wedges played a vital role in the woodworking technology of all ethnographic groups along the Northwest Coast. Bone and antler examples are found at most archaeological sites in this region. Most wedges, however, would have been of wood, which has disappeared from the archaeological record at the vast majority of sites. This is confirmed from the waterlogged deposits at Ozette, where wedges were one of the most common tool types recovered (Gleeson 1980: 62). Wooden wedges were by far the most abundant, followed by whalebone, then

by antler. A wide range of sizes and shapes suggest somewhat different functions.

All four of the whalebone wedges from Ts’ishaa appear to be based on split sections of whale ribs. This has resulted in a curved outer surface and a flat inner face. Three are complete, while one is missing the butt end. They tend to be relatively long and thin; measurements are 23.7 x 5.0 x 1.7 cm, 19.1 x 6.6 x 2.4 cm, 15.9 x 4.8 x 1.8 cm, and (11.8) x 3.6 x 1.1 cm. All three intact examples show evidence of cutting to length at the butt end and shaping along the sides. The tip is rounded in three cases, and more squared (only slightly curving) in the other. None show evidence of extensive damage to the bit or battering at the butt end. Very similar objects are relatively common in the Ozette assemblage (Gleeson 1980: 63; Huelsbeck 1994: 287). Gleeson (1980: 62) notes that these rather thin and flat wedges are particularly useful for splitting boards.

The one antler wedge is considerably different in form. It is based on a large, stout, beam section of antler, which is clearly from an elk (wapiti) rather than the much smaller coast deer. It has been cut at an angle from about the mid-point of the object to the bit end. The cut is across the narrowest dimension of the antler beam, producing a relatively narrow, steep, rounded bit. Use damage has removed much of the butt end, although the complete length is still evident. The object’s dimensions are 15.5 x 3.4 x 5.0 cm. Gleeson (1980: 62) suggests that the steeply angled bits of such tools made them particularly useful for starting splits in wood.

Bark shredder fragments (2) Two whalebone fragments each exhibit two flat faces and a portion of one intact edge. The latter is bifacially bevelled to produce a straight, relatively blunt, knife-like edge,

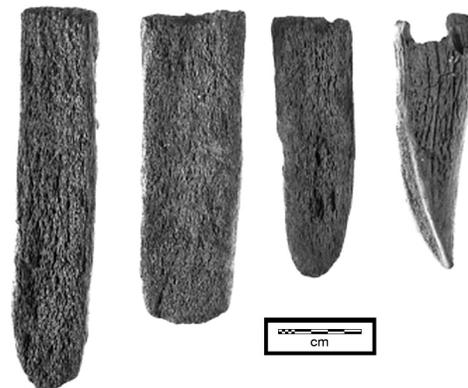


Figure 33. Wedges from Ts’ishaa (three whalebone, one antler).

such as is characteristic of bark shredders. As these are relatively small fragments, however, such an identification is tentative.

Shredded cedar bark, processed with a chopper of whalebone, had numerous uses among the Nuu-chah-nulth (Drucker 1951: 97). Whalebone shredders are found at such archaeological sites as Yuquot (Dewhirst 1980: 164) and Ch'uumat'a (McMillan and St. Claire 1994: 26). They are a relatively common artifact type at Ozette, from both the midden trench and the preserved house deposits (McKenzie 1974: 58; Fiskin 1994: 372; Huelsbeck 1994: 284). Most of the Ozette examples are simple rectangles, lacking handles or a perforated grip area, with at least one shredder-type edge. Whalebone bark shredders are listed by Mitchell (1990: 356) as one of the characteristic tools of the West Coast culture type.

Straight adze handle (?) (1) This club-like object, (22.1) cm in length, is based on a whale vertebral process (Fig. 34). Its large blunt body, with a cross-section in the form of a rounded rectangle 6.8 cm wide and 3.1 cm thick, takes its shape largely from the unmodified bone. At one end, the object has been steeply cut away from the lower surface, to produce a narrow handle, only 1.9 cm wide and 1.8 cm thick, which is oval in cross-section. Although it has broken at its end, about 7 cm of the handle remains. The work is rough, with chop marks still evident on the underside of the handle and little evidence of polish. Several long cut marks are visible along one face of the body, parallel with the long axis of the artifact.

Although this object resembles a small club, the handle is too narrow and fragile for all but the lightest of pounding. Instead, it is more likely



Figure 34. Whalebone artifacts from Ts'ishaa (upper – straight adze handle?; centre – two harpoon foreshafts; lower – harpoon preform?).

the handle of what Gleeson (1980: 94) terms a “weighted straight adze.” Several examples from Ozette are similar in size and form to this object, although they are more carefully finished and polished (Gleeson 1980: 96). A thin cutting blade of mussel shell or metal was hafted in a cut step at the end of the handle, where the break occurs on the Ts'ishaa example. The object was grasped at the base of the handle, with the weight of the body providing force in cutting. According to Olson (1927:15–16), straight adzes are generally distributed to the south of the Strait of Juan de Fuca. Gleeson (1980: 94) maintains that those from Ozette are the only archaeological examples known of this sub-type.

Harpoon preforms (2) Two whalebone objects appear to be roughed-out preforms for large harpoon or lance heads. One (27.4 cm in length) is intact (Fig. 34, bottom). It is rectangular in cross-section, with long sides gradually converging to a blunt tip. Two slight shoulders, possibly bilateral line guards, are above a tapering base. The object has been roughed out only; areas of chopping to shape are still evident along the sides and there is little evidence of polishing on the bone surface. The other implement (20.5 cm in length) has split lengthwise. The intact side is straight, terminating in an abrupt shoulder which extends to an elongated tapering stem. The stem, in particular, shows extensive evidence of chopping to shape, indicating that this object has only been roughed out.

Crude whalebone club (1) This object is a section of whale rib, 42 cm in length. At the distal end it shows evidence of having been roughly cut to length; although it has broken at that end it appears to be complete or nearly so. The proximal end has been adzed to a very blunt point. Large shallow areas have been removed from both sides near this end, creating a comfortable hand grip. Slight use wear appears on the underside. Such simple clubs were often used on fish or seals.

Worked whale bulla (1) One whale bulla (the dense bone of the inner ear in cetaceans) appears to have been modified. The thinner outer edge has been chipped away to expose the inner surface, leaving a ridge of hard bone. Flaking scars are still evident along this ridge, although it shows considerable wear, presumably from use as a crude scraping tool. The dense base of the object fits nicely in the palm of the hand and provides weight for heavy use. A nearly identical example, except for being

blackened by burning, came from Himayis. Very similar artifacts were found in some number at Ozette, where it was first suggested that these were crude scraping tools (Fisken 1994: 375–6).

Miscellaneous worked bone (excluding whalebone) (43) Two objects show evidence of tool production from deer limb bones. One is the proximal portion of a deer metacarpal which exhibits a deep cut running the length of the fragment down its centre. This presumably marks a stage of sectioning the bone for tool manufacture. The second object is the proximal end of a deer metatarsal which had been split lengthways, then cut and snapped perpendicular to the long axis of the bone. This articular end would have been the discarded waste from tool production.

One elongated curved fragment of sea mammal bone is round in cross-section. It has one flat angled end intact, with a deep angled groove half-way through the object a short distance above the intact end and parallel to it. It is possible that the groove is the bed for a bone or wood point and that the object is the distal portion of a fishhook shank, although this identification is tentative.

A caudal vertebra from a harbour porpoise (*Phocoena phocoena*) has been deeply gouged on both faces. This may stem from some activity such as extracting oil, rather than artifact manufacture.

The remainder of the objects in this category show evidence of cutting, grinding, or polishing, but are too fragmentary to classify elsewhere. While a few represent stages in artifact manufacture, most appear to be fragments of finished tools.

Miscellaneous worked whalebone (53) Many objects in this category show evidence of adzing to shape and are fragments of roughly made implements or stages in artifact manufacture. Several prominently display rows of facets produced by adzing along their edges. Others show evidence of adzing or chopping at one or both ends, where they were partially cut to length then snapped. One short stubby object (12.4 x 5.6 x 3.5 cm) appears to be a whalebone stake, with numerous facets visible where it was adzed to a blunt point at one end.

One complete object of unknown function is spatulate in shape. One highly-polished end, slightly wedging to a flat polished base, expands to a thicker, more roughly shaped body with a flattened end. It is 12.0 cm long, with its greatest width 3.3 cm and thickness 1.1 cm. Additional pieces of whalebone show evidence of ground edges or other intentional shaping. These are pre-

sumably from finished tools which are now too fragmentary to identify.

Many other flat pieces of whalebone have been sectioned into elongated segments, presumably for tool manufacture. Many show evidence of a “cut and snap” technique.

Cut marks or prominent scratches are evident on the surfaces of other objects in this category. Several have clearly been cut to length. One whale vertebral process shows numerous striations running along its long axis on both faces, suggesting use as a cutting board.

Miscellaneous worked antler (15) Three large sections of antler beams appear to be too large for coast deer and are presumably from elk (wapiti). The largest, 20.2 cm in length, has had a side branch cut off and both ends deeply cut around their circumference and then snapped. Another has been roughly cut to length at both ends then split down the centre, so that half the beam remains. The third has been chopped to length at one end, then split lengthways, leaving about a quarter of the beam thickness. A fourth beam section is smaller (possibly from deer) and more extensively worked. It shows evidence of cutting and snapping at both ends, lengthways splitting, and shaping and polishing along the sides. All four presumably represent stages in artifact manufacture.

Other items in this classification include three elongated split cortical sections of antler beams, two smaller pieces which have been cut and shaped, and two relatively small objects which have been cut to length and width, possibly as blanks for harpoon valves. All presumably are stages in artifact manufacture.

Also included in this category are three cut antler tines and a small branching section of antler with both tines cut off. Two of the tines are tips, which may be the discarded waste of tool manufacture. The third is larger (at 13.1 cm in length) and has been cut and polished at its base, with faceting and polishing at the oval, somewhat flattened, tip indicating use as a tool.

Artifacts of Stone

Chipped biface (1) This well-made chipped biface, of very fine-grained crystalline rock with small crystal inclusions, is complete except for a small area at its base (Figs. 35, 36). Its measurements are 6.5 x 3.1 x 1.2 cm. It is generally leaf-shaped, with a thick base and slightly curving sides converging to a fairly blunt tip. As well as being flaked over

both faces, grinding and polishing are evident on the high points. It was recovered from a depth of about 0.9 m in EA 3, well above a radiocarbon sample from near the base that produced an age estimate of 1690 to 1350 cal BP.

This object seems anomalous in this assemblage, where well-made chipped stone implements are otherwise lacking. Such artifacts are also absent from other Nuu-chah-nulth sites of this age. Closest parallels are with the lower levels of Ch'uumat'a (McMillan and St. Claire 1996; McMillan 1999:114) and the early component at Shoemaker Bay (McMillan and St. Claire 1982), both of which significantly predate this assemblage.

Chipped phyllite chopper (1) This flat slab of chlorite phyllite, measuring 13.6 x 8.7 x 1.9 cm, is an irregular four-sided shape. It has been roughly flaked along two adjacent sides, with bifacial flaking along the narrower of these producing a chopper edge.

Obsidian flake (1) One small obsidian flake was found just beneath the sod in EA 1. This thin, elongated, irregular flake, measuring 1.75 x 1.05 x 0.2 cm, appears to be from a late stage of artifact manufacture. Its presence in this assemblage, particularly from this uppermost level, seems anomalous and is assumed to be a result of disturbance from older deposits behind the main site area. Early twentieth-century farming on the island may have resulted in such surface disturbance.

Source analysis for this obsidian was conducted at the X-ray Fluorescence Laboratory in the Department of Chemistry at Simon Fraser University (James 2001). X-ray Fluorescence (XRF) is a non-destructive technique which measures the relative amounts of specific trace elements contained within the sample. The results are compared to the known composition of obsidian from various source areas. This analysis determined that the obsidian flake came from the Three Sisters source in central Oregon. This is a location of high-quality obsidian, in close proximity to other noted obsidian sources such as Glass Buttes and

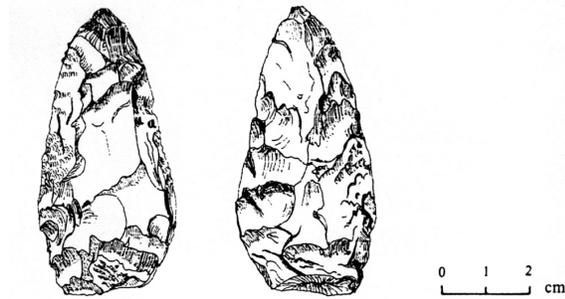


Figure 35. Chipped stone biface from EA 3, Ts'ishaa.

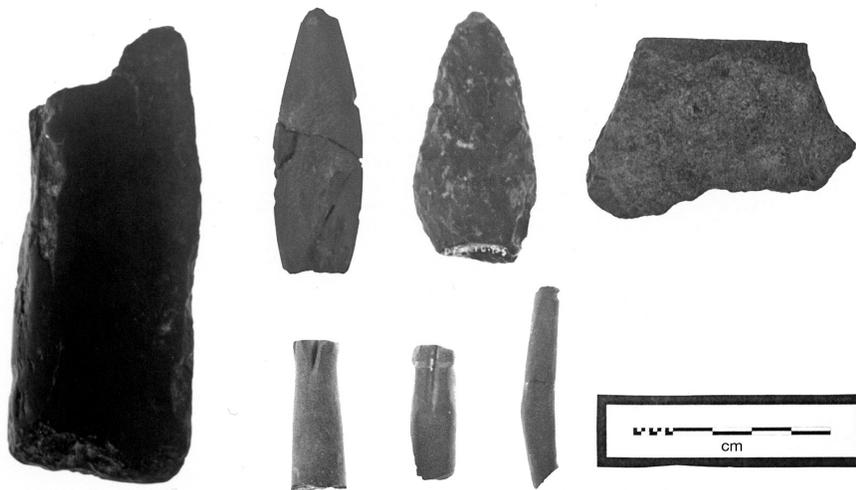


Figure 36. Miscellaneous stone artifacts from Ts'ishaa (left – celt preform?; upper row – ground slate point, chipped stone point, chipped and ground schist knife; lower row - fishhook shank fragments).

Newberry Caldera. Obsidian from these sources has been reported for a number of sites in southern coastal British Columbia, particularly in the Strait of Georgia region (Carlson 1994). Small obsidian flakes were relatively numerous in the early component at Shoemaker Bay; although most came from sources on the central British Columbia coast, Glass Buttes and Newberry Caldera were represented by one flake each (McMillan and St. Claire 1982: 70). Oregon obsidian declines in quantity over time in British Columbian sites; Three Sisters obsidian is unknown from archaeological deposits dating to the last 1000 years (Carlson 1994:355; James 2001). This fact supports the inference that the Ts'ishaa example, which was found on the surface of the midden, was redeposited there from an older context. The presence of two artifacts of central Oregon obsidian from the earlier component on the back terrace at Ts'ishaa also supports the idea that this flake was redeposited from this older context.

Chipped and ground schist knife (1) This is a fragment of a flat schist artifact with a portion of one worked edge intact (Fig. 36). It is broken at both sides, measuring (6.9) x (4.7) x 0.4 cm. The intact edge has been chipped along one face, then bifacially bevelled through grinding to produce a straight cutting edge, 4.3 cm of which remains.

Chipped schist knives are unknown from other Nuu-chah-nulth sites of this age, although they have been recorded from the lower levels at Shoemaker Bay (McMillan and St. Claire 1982) and Ch'uumat'a (McMillan and St. Claire 1996; McMillan 1999: 114), and are present in the assemblage from the back terrace at Ts'ishaa (see Chapter Five). This object came from Layer D, near the base of EA 1, slightly below a radiocarbon date of 1520 to 1290 cal BP.

Ground stone points (2) One well-made slate point is largely complete, although broken into fragments (Fig. 36). The reconstructed artifact, measuring (6.8) x 2.3 x 0.5 cm, is lacking only small areas at the tip and base. The carefully ground faces are faceted to the curving sides. The second point, of phyllite, is in poor condition as the stone is friable and splitting. It measures (8.0) x 1.7 x 0.5 cm. Both faces have been ground flat, with abrupt narrow facets at the edge of each to form almost straight converging sides.

Such ground stone points are not characteristic of Nuu-chah-nulth sites, although they have been found in small numbers in the western Barkley

Sound sites of T'ukw'aa and Ch'uumat'a. They are more abundant in the Shoemaker Bay assemblage (McMillan and St. Claire 1982) and in sites in the Strait of Georgia region (Mitchell 1971).

Notched pebble (sinker?) (1) This small rounded beach pebble is somewhat irregular in shape. One end shows evidence of bifacial flake removal, with a single flake removed from each opposing face, producing a notch. At the other end of the pebble is a naturally occurring notch. This minimal modification may have been all that was required to hold a line wrapped around the pebble for use as a sinker.

Jet pendant (1) One unique stone artifact is a small (3.4 x 1.3 x 0.4 cm) highly-polished black pendant, taking the form of an elongated triangle with rounded corners (Fig. 37). A small biconically drilled hole is near the wider end. The raw material appears to be jet, a hard black lustrous variety of lignite which can be carved and polished. Although the entire surface is highly polished, numerous fine abrasion lines are still evident. This object was found in the upper levels of EA 1. As it is complete, its presence in the midden likely indicates that it was lost by its original owner. A similar drilled jet pendant, although somewhat smaller and less highly polished, came from Zone III at Yuquot (Dewhurst 1980: 323), which would be roughly contemporaneous with the example from Ts'ishaa.

Muller (1980:13) speculates that "small coaly lenses" in the Jurassic rocks along the outer coast of Vancouver Island could have provided the material for the Yuquot pendant. Another possibility for the Ts'ishaa artifact is a black schistose slate from

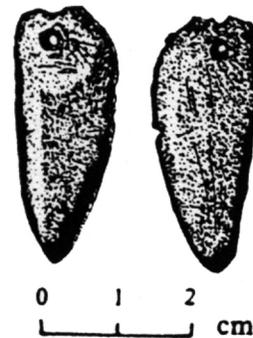


Figure 37. Jet pendant from upper EA 1 at Ts'ishaa.

a deposit to the southeast of Barkley Sound, where some occurrences are so carbonaceous, black and lustrous that they resemble graphitic coal (Clapp 1912, in Wilson, Appendix A). However, the light weight of the Ts'ishaa example suggests that it is jet rather than black slate.

Celt preforms (?) (3) Three fragments, all of black slate, show evidence of extensive grinding and polishing over at least one face. Some intact surfaces are still rough, however, suggesting that these are unfinished implements, rather than fragments of tools such as celts. The largest and most complete is rectangular in shape, with roughly parallel sides (Fig. 36). Missing one end, it measures (11.5) x 4.7 x 1.3 cm. It has been polished smooth on one flat face, but only the high points are polished on the other face and the sides. The one intact end appears to be unfinished, but the high points have been ground flat. While this object appears to represent a stage in celt manufacture, no intact stone celts have been recovered from the main village site and such an identification is tentative.

Fishhook shanks (3) All three artifacts in this category are incomplete (Fig. 36). One appears to be a simply-made distal fragment, made of fine-grained grey metamorphic rock. Nearly round in cross-section and with a flat base, it has an incised groove (1.1 cm in length) extending along one side from the base and a marked constriction at the opposite side of the base. The groove may have served as a point bed, holding a sliver of sharpened bone or hard wood, and the constriction would have helped to keep the binding in place. However, it is also possible that this is a proximal fragment, with the constriction and groove to hold the suspension line. This fragment is (3.8) cm long and 1.6 cm in diameter (although it is still expanding at that point).

Both other fragments are red in colour, made of fine-grained hematitic sandstone, and are rounded rectangles in cross-section (Fig. 36). One is a distal fragment, split lengthways into two pieces that can't be joined. An incised point bed, 1.5 cm in length, extends from the flat distal end. Although the area of the base opposite this is missing, a constriction around the sides just above the base clearly would have extended around to the missing face to facilitate binding a sharp point in the point bed. This fragment is (3.5) cm long and 1.3 cm wide. The other is a medial section, measuring (5.1) x 0.9 x 0.6 cm. Evidence of an encircling groove, presumably for line attachment, is still

visible at the narrowest end, indicating that only a small area of the proximal end is missing. At the other end, the long straight shaft has the beginning of a "dog-leg" curve to the missing distal portion, typical of stone fishhook shanks.

Ethnographically, stone fishhook shanks were part of specialized trolling hooks, particularly for salmon. Drucker (1963: plate 3; 1965:18) illustrates such complete fishhooks. Such artifacts are found at all the western Barkley Sound sites (McMillan and St. Claire 1992, 1996), as well as at Yuquot (Dewhurst 1980), Hesquiat (Haggarty 1982), and Ozette (McKenzie 1974). They are a characteristic feature of the West Coast culture type (Mitchell 1990). Stone fishhook shanks are relatively late in the archaeological record, appearing only well into the Late period at Yuquot (Dewhurst 1980:343). All of the Ts'ishaa examples are late; two are from the uppermost layer of EA 2, while one came from much deeper deposits but toward the front of the site in EA 2, where all materials are relatively late.

Hammerstones (6) All are complete rounded beach cobbles that show evidence of pitting on at least one end, suggesting use as hammerstones. They range from 11.9 to 19.9 cm in maximum dimension, and from 757 to 1914 g in weight (mean = 1238 g). Two show pitting at one end only, another shows pitting at both ends, and another has extensive battering and pitting at both ends and one face, along with slight battering along one long edge. An additional example shows evidence of extensive battering at both ends, in one case heavy enough to remove a large flake, with additional pecking along both long sides, producing flattened facets. The final example, the smallest of the group, is a very smooth cobble of fine-grained material, possibly basalt. Both ends show evidence of pecking, with sufficient force to drive a small flake off one, but the entire object has been highly polished, leaving only flattened facets at each end.

Hammerstones are simple expedient tools that could be used for a wide range of tasks. For example, Drucker (1951:77) mentions the ethnographic Nuu-chah-nulth practice of laboriously producing stone mauls by pecking them to shape with any suitable hard cobble. Such tools are found in archaeological assemblages all along the Northwest Coast.

Abrasive stones (58) Abrasive stones are the most common of the stone artifacts, making up 74.4% of the total for that category (although only 7.9% of all artifacts from the site). All are of sandstone,

ranging from very fine-grained to quite coarse-grained. A small fragment of polished siltstone, incomplete in all dimensions, is also included, possibly as part of a whetstone, although it may be a fragment of some other finely polished artifact. All are of a size that could be held comfortably in the hand (although one is at the upper range of such a classification). The incomplete nature of most abraders hinders classification by shape. Only 16 examples were judged to be complete. Their dimensions are shown in Table 6.

Only 16 shaped abraders were noted. Such abraders were carefully ground flat over both faces and all intact sides. The most common shape is an elongated rectangle or a tapering bar (Fig. 38). Evidence of sawing to shape is evident on three examples. In one case, one long side was formed by sawing from both faces and snapping, leaving a rough central ridge, while in two other cases this edge was then ground flat. In addition to these shaped abraders, a large irregular slab has a deep sawn groove running the length of one flat face, although the object clearly is unfinished. As fragments with no intact edges remaining were not included, this category would likely have been larger. Most abraders, however, are simply rough slabs or cobbles of sandstone that were picked up and used without further modification.

Most abraders (39; 67.2%) have been worn

on both faces. Only 19 show wear on one face only and several of these are fragments which are incomplete in thickness. In the great majority of cases wear has resulted in an essentially flat surface. Seven abraders, however, have shallow dished depressions worn into one face. Two others have narrow grooves, presumably from sharpening small objects such as bone points, on one surface. One of the dished depressions exhibits a reddish encrustation which may contain red ochre, indicating that this abrader was used in preparing a red paint. Another has a thick encrustation of black, presumably organic, material on one face, while another has similar staining across one face and part of one side.

The abundance of abrasive stones in this assemblage reflects their obvious importance in the technology. Such objects were extensively used in woodworking, as well as in the production of the stone, bone, antler, and shell artifacts that show evidence of having been ground to shape. Ethnographic sources indicate the importance of such objects in the carpentry toolkit (Drucker 1951:79; Boas 1966:31). Archaeologically, abrasive stones are common in almost all Northwest Coast sites. At Ts'ishaa, however, they are much less abundant than at Yuquot or Hesquiat, where they comprise roughly half of the total artifact assemblage (McMillan 1999:172), or Shoemaker Bay, where

Table 6. Complete abrasive stones from Ts'ishaa Village (No.=16)

No.	Dimensions (cm)	Comments
354	8.0x2.5 x 1.2	shaped abrader – one side sawn to shape
414	9.8x2.6 x 1.3	irregular shaped abrader – one side sawn
352	12.2x4.4 x 1.4	naturally shaped pebble with both faces ground flat
273	11.7x3.8 x 1.1	shaped abrader – elongated bar
522	19.4x5.4 x 3.4	natural shape with both faces ground – possible red ochre stain
555	6.8x4.6 x 2.5	small natural pebble with both faces ground flat
251	11.3x6.4 x 2.8	rounded pebble – ground depression on one face
287	25.2x12.0 x 4.2	large irregular slab with both faces ground flat
306	5.7x3.4 x 1.3	small rectangular pebble ground on one face
635	6.8x3.8 x 1.5	rectangular flat slab with both faces ground flat
672	11.8x6.2 x 2.1	irregular flat slab – both faces ground flat with black organic staining on one face
420	9.1x8.2 x 2.1	irregular flat slab – both faces ground flat with black organic staining on one face
296	8.8x5.4 x 1.7	triangular natural shape with one ground face
224	8.6x5.1 x 1.3	irregular flat sandstone with both faces ground flat
102	11.5x8.1 x 1.7	one face only, with marked worn depression across length
295	10.0x9.7 x 1.3	irregular flat shape with both faces ground – broken edges show slight wear indicating continued use

they form over a third of the total (McMillan and St. Claire 1982:124).

Artifacts of shell

Mussel shell harpoon blade (1) Although missing its base and a small area at the tip, much of this object is intact. It has been extensively ground over its entire surface. Both intact edges have been bifacially bevelled, producing long, straight, converging sides, suggesting that the object was once triangular in shape. The fragment is 4.6 cm long (although the original object was clearly longer), 3.3 cm wide (although the sides are still expanding at the point of the break), and 0.4 cm thick.

Identification of this object as the cutting blade of a whaling harpoon is confirmed by its context. It was discovered during the excavation of Feature 57, a large stack of whale bones on the lowest terrace of EA 2 (see description under Features). Exposure of a large whale skull in the feature revealed the presence of the mussel shell harpoon blade, still deeply embedded in the occipital bone. Examination of the point of entry places it above and behind the right eye of the animal. Although mussel shell tends to shatter when contacting the bone, in this case the blade

entered at a very shallow angle, resulting in its relatively intact state. Clearly the whale had been harpooned and dragged to the beach in front of the site, where it was butchered. Subsequently a number of bones, from several different whales, were stacked at the front edge of the site, on the lowest terrace, with the harpoon point still embedded in the skull.

The use of mussel shell for whaling harpoon blades is well documented in the ethnographic literature for the Nuu-chah-nulth and Makah (Drucker 1951: 28; Waterman 1920: 32; Koppert 1930:60; Arima and Dewhirst 1990: 395). Waterman (1920: 32) notes that the thin brittle mussel shell effectively penetrated into the flesh of the whale before shattering. Archaeologically, mussel shell harpoon points are also reported for two of the Hesquiat Harbour sites (Haggarty 1982: 122, 160) and for Dfsj-30, on an outer coast islet in Toquaht territory, western Barkley Sound (McMillan and St. Claire 1994: 42). Discoveries of mussel shell blades still embedded in whale bones were made at T'ukw'aa (McMillan 1999: 132; Monks et al. 2001) and Ozette (Huelsbeck 1994: 281; Fisker 1994: 367). In these cases, however, the blades had shattered as they entered the bone, leaving only a thin line of mussel shell remaining.

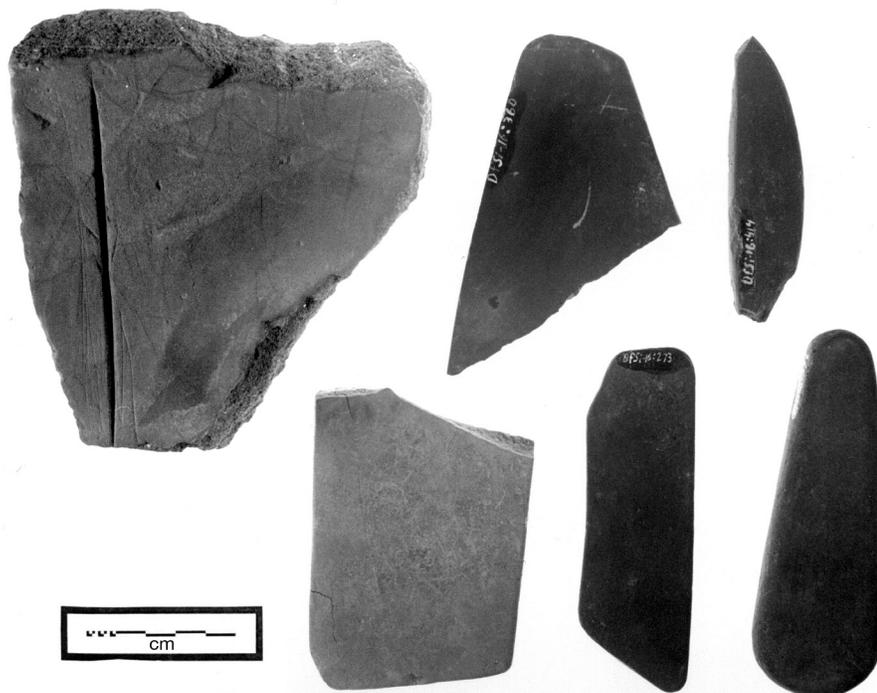


Figure 38. Abrasive stones from Ts'ishaa (large sawn abraded, shaped abraders).

Miscellaneous ground mussel shell (18). All recovered mussel shell artifacts are fragments of larger objects (Fig. 39). When exposed by excavation, mussel shell is generally very soft and fragile, requiring immediate conservation measures. Mussel shell tools are almost certainly greatly under-represented in the collection from Ts'ishaa due to factors of preservation and low visibility in a shell matrix.

Only four objects show evidence of sharpening along an edge. The most complete is a section of burnt shell that has been ground over its entire surface to produce a thin artifact (0.2 cm thickness) with a long, curving, bifacially-ground knife edge. Another two fragments each have a slightly curving, steep, uniaxially-ground edge that would be serviceable as a knife or small chisel. Both have also been extensively ground over the outer (dorsal) surface of the shell. The fourth artifact appears to be a celt bit fragment, although only a small portion remains. This is a somewhat thicker object (0.9 cm), which retains part of one flat side and a small section of the steep, straight, uniaxially-ground bit.

Two large, thick, well-made objects appear to be the butt ends of large shell celts, now missing

their bits. One is rectangular in shape, with straight flat sides and end. It is 5.3 cm wide and 1.2 cm thick. The other, with flat sides converging to a rounded poll, is also extensively ground on both the dorsal and ventral surfaces of the shell. This fragment is 5.2 cm wide, although the shell is still flaring out at the break so the original object would have been larger, and 1.2 cm thick.

One small thin fragment has been ground flat over all surfaces, completely removing the natural ridges of the dorsal face. Measuring (4.5) x 1.4 x 0.2 cm, it is incomplete in length only. The two thin flat edges gradually converge toward one (broken) end. It is possibly a fragment of a small projectile point or harpoon cutting blade.

The remaining 11 examples are even more fragmentary. Three have portions of a flat side and adjacent end present, suggesting that these are the polls of celts or chisels. One has three intact flat, slightly curving, sides, creating an irregularly shaped flat object. Seven retain evidence of only one flat ground edge. Several of these also show evidence of grinding over the shell's dorsal surface.

Ethnographically, the widespread availability of large mussel shells made them a favoured raw

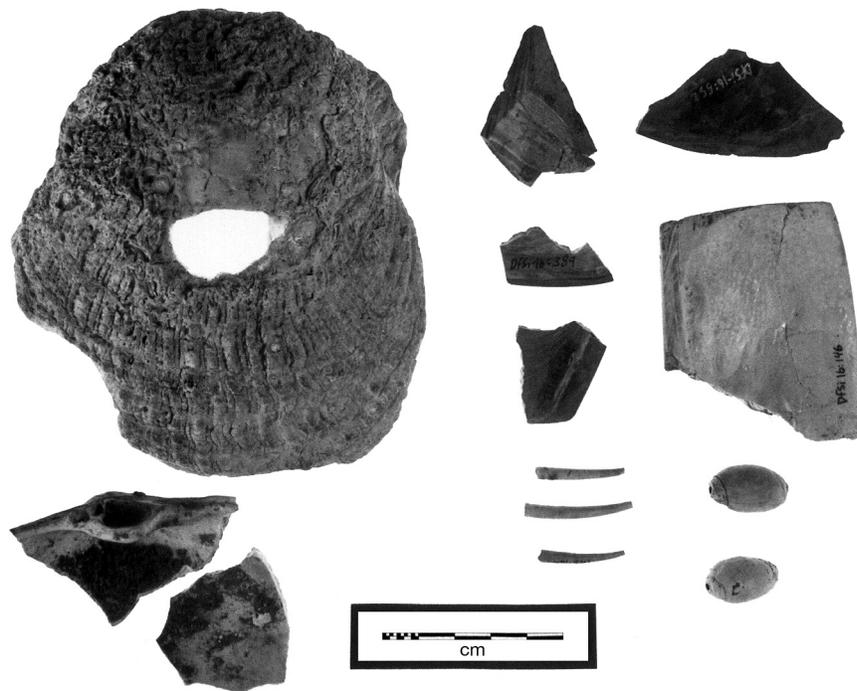


Figure 39. Shell artifacts from Ts'ishaa (clockwise from upper left: perforated scallop shell; mussel shell artifacts [harpoon cutting blade, two knife fragments, two probable celt fragments]; Olivella shell beads; dentalium beads; clam shell ochre bowl).

material for a variety of tools. Drucker (1951:91) points to the importance and common use of the mussel shell fish knife among the Nuu-chah-nulth. Sproat (1987:63) describes the use of sharpened mussel shells as heavy-duty woodworking tools among the Nuu-chah-nulth, as does Swan (1870:36) for the Makah. Mussel shell tools, including knives and celts, are one of the characteristic features of the West Coast culture type. They have been recovered from almost all Nuu-chah-nulth and Makah sites. At Ts'ishaa, they came from almost all layers of the EA 1 and 2 trenches.

Dentalium shells (6) Six complete dentalium shells (*Dentalium pretiosum*) came from Ts'ishaa (two from EA 1, one from the middle terrace of EA 2, and three from EA 3). Lengths are from 2.3 to 3.1 cm; diameters at the largest end are 0.3 to 0.4 cm. Only one appears to have been cut to length. Although most are unmodified, their presence in the midden likely is a result of their ornamental and prestige value (McMillan 1999:155–7).

The natural tube shape of the dentalium shell allowed stringing as beads, in necklaces and bracelets, and as ear or hair ornaments. Such items were in widespread use among the Nuu-chah-nulth (Drucker 1951:139–140). As the open waters of the west coast were the source of most dentalium, the Nuu-chah-nulth were major suppliers of this highly-sought trade item. However, only very small numbers have been excavated from Nuu-chah-nulth sites. T'ukw'aa, Ch'uumat'a, Yuquot, Shoemaker Bay, and one of the Nitinat Lake sites each had one or two examples (McMillan 1999:157). In contrast, dentalium shells have been recovered in considerable quantities from sites in the Strait of Georgia region, particularly those dating to the Marpole period, far from any natural supply of these decorative objects. Almost all, however, were recovered from burial contexts. Only in the unique circumstance of Ozette, in the well-preserved floor of a high-status Makah house, do we find evidence of substantial quantities of dentalium in a west coast site (Wessen 1994:353).

Olivella shell beads (13) The attractive shiny shells of the Purple Olive (*Olivella bipicata*) were made into beads simply by grinding away the spire at one end to allow stringing. Three such artifacts were recovered from the middle terrace of EA 2, all from quite recent deposits, while ten were found in the lower levels of EA 3. Olivella shell beads were also recovered from T'ukw'aa

(McMillan and St. Claire 1992: 54) and were relatively common in the protohistoric Ozette house remains (Wessen 1994: 352).

Clam shell disc bead (1) This very small white shell bead is only 4 mm in diameter and 1 mm thick. Circular in outline, it has flat faces with a biconically-drilled central perforation, and appears to have been manufactured from clam shell. It was recovered during fine screening of bulk matrix samples from Layer B of EA 1.

Clam shell ochre bowl (1) A large fragmentary shell from a horse clam (*Tresus nuttalli* or *T. capax*), with only the hinge area and a section of body recovered, is thickly encrusted with dark reddish-brown ochre (Munsell 2.5YR 3/6) (Fig. 39). It came from near the base of the middle terrace in EA 2. Ochre was widely used as a pigment all along the Northwest Coast. It was ground into a powder and mixed with an organic binder, such as crushed or chewed salmon eggs, to form a paint (Drucker 1951:83). The thick hardened deposit in this clam shell suggests that it is dried paint, with the ochre mixed with its binder.

Ethnographically clam shells were used as spoons and containers by the Nuu-chah-nulth (Drucker 1951:92, 108; Jewitt 1967:59). Except for rare cases such as this, where the contents are still evident, these objects would not be recognizable in excavated shell midden sites. A similar ochre-encrusted clam shell came from the Ozette midden trench (McKenzie 1974:113). Clam shell bowls containing ochre also have been recovered from Strait of Georgia sites (Mitchell 1971:215–6; Burley 1988:126).

Perforated scallop shell (1) A large shell of the Purple-hinged Rock Scallop (*Crassadoma gigantea*) is complete except for a chip out of the outer margin (Fig. 39). Its dimensions are 13.1 x 11.8 x 2.4 cm. A central perforation in the form of a rounded rectangle, 2.5 x 1.7 cm in size, appears to be deliberately placed. The edges of the perforation are rough, as if it had been punched out. This central perforation may have allowed the shell, along with a number of others, to have been strung on a hoop of withe or root for use as a dance rattle.

Ethnographically, scallop shell rattles were widely used among the Wakashan and Coast Salish peoples. They are particularly well-known among the latter, where they were used by the sxwayxway ritualists (Barnett 1955:158). Suttles (1987:109) describes the equipment of such dancers as in-

cluding “a rattle made of perforated scallop shells strung on a wooden hoop or pair of hoops.” Scallop shell rattles were also used by the central Nuu-chah-nulth groups during a shamans’ society performance (Drucker 1951:106). The Makah, who avoided eating scallops due to their “special powers,” also used these rattles in their ceremonies (Swan 1870: 24). Such rattles, however, were characteristically made from the thinner shells of the large Weathervane Scallop (*Pecten caurinus*).

Archaeological discoveries interpreted as parts of scallop shell rattles have been made at several sites in the Strait of Georgia region. Again, these are all of the thinner *Pecten* shell. Burley (1989:127) reports such objects from the False Narrows site on Gabriola Island. At Tsawwassen, a cluster of *Pecten* shells, interpreted as the remnants of a complete rattle, was found intact in the midden deposits (Arcas Consulting Archeologists 1999:32, 256). The Purple-hinged rock scallop shells may be too thick and heavy to have served as effective rattles. Such shells were more commonly cut up and used for ornaments, such as pendants and gorgets (Burley 1989:127).

Another perforated Purple-hinged Rock Scallop shell came from one of the Nitinat Lake sites (Eldridge and Fisher 1997:86). It is very similar to the Ts’ishaa artifact except for being slightly smaller and having the perforation closer to the hinge. Eldridge and Fisher (1997:66) argue that the object is too heavy to have been part of a shell rattle and interpret it instead as a gorget preform. As there is little modification other than the perforation, however, it is difficult to see how that interpretation is warranted. Both the Ts’ishaa and Nitinat Lake artifacts may represent initial stages in the manufacture of shell ornaments. However, they may also have been used ritually as parts of scallop shell rattles where the more suitable *Pecten* shells were rare or unavailable. *Pecten* are not common in the site area today, and no such shells have been identified in the Ts’ishaa midden deposit.

Artifacts of tooth

Worked canine teeth (6) Canine tooth pendants, generally unmodified except for an incised suspension line, have been found at most West Coast sites. Two such artifacts came from Ts’ishaa. In one case, a harbour seal (*Phoca vitulina*) canine has a thin sharply incised line encircling the object near the root end (Fig. 32). The second canine, from an adult male fur seal (*Callorhinus ursinus*),

is considerably larger, although it is somewhat battered and split. In this case, suspension was from a much wider, but shallow, groove near the enamel tip.

Four other canine teeth have been modified in different ways. One, a complete tooth from an adult male sea otter (*Enhydra lutris*), shows extensive grinding and polishing, creating large flattened facets on both faces extending from mid-body to the root ends. Another is a large fragment of an adult male Northern sea lion (*Eumatopias jubata*) canine which has been split lengthways, with straight sawn and polished sides gradually converging toward the worn enamel tip. In the third case, a sea lion (probably adult female Northern sea lion) canine exhibits a large “V-shaped” incision which has been cut deeply into the enamel end of the tooth. The incised area has been polished and slight polish is also evident at the root end of the object. The fourth item is a split section of enamel, appearing to be from a sea lion canine, which has been cut flat and polished at the enamel tip. It is difficult to see what function any of these could have served.

Elk tooth pendant (1) This object is based on the distinctive upper canine of the male elk (or wapiti, *Cervus elephas*) (Fig. 32). It has been ground and polished over much of its surface, resulting in a number of flattened facets. The root end has been extensively worked, producing a “waisted” appearance for suspension. The upper surface is double notched to create three triangular peaks, with the middle one shorter than the two at the edges.

Such an object is unusual, if not unique, among Northwest Coast assemblages. Elk tooth pendants, however, are relatively common grave inclusions in late prehistoric and early historic contexts on the Plateau (Schulting 1995:37), although most are perforated for suspension. Elk tooth ornaments were also widely used ethnographically on the Plains, particularly as decorations sewn on women’s dresses.

Elk are not available in the vicinity of the site today, although they could have been taken near the upper shores of Barkley Sound and its inlets. This object may have reached Ts’ishaa through trade. Its context in Layer A on the upper terrace of EA2 suggests that it is late precontact in age.

Beaver incisor tool (1) One beaver (*Castor canadensis*) incisor, missing the root portion and with the distal end ground to a flat surface, was found deep in the lower terrace of EA 2. Although

beaver are available on the Vancouver Island mainland, they are not found in this outer island environment, indicating that this item had to have been brought into the site, presumably for use as a tool. This artifact is typical of examples found at the Ozette site, which were snapped, the root end discarded, and the occlusal surface ground flat (Gleeson 1980:108). They were then hafted as small woodworking implements.

Beaver incisor tools are found at other Nuuchah-nulth sites, such as Yuquot (Dewhirst 1980:133), Hesquiat Village (Haggarty 1982:122), and T'ukw'aa (McMillan and St. Claire 1992:51). A beaver tooth knife was found intact in its carved wooden haft in the preserved house deposits at Ozette (Kirk with Daugherty 1978:100; Gleeson 1980:109), demonstrating Makah use of such woodworking tools in the late prehistoric or protohistoric period.

Historic materials

Iron fragment (1) Only one metal object was recovered (from the upper layer of EA 1). This is a small rectangular fragment of iron, measuring 5.3 x 1.9 x 0.5 cm, with a low circular projection in the centre of one face. Its function is not evident. The lack of other such materials is surprising, considering the Tseshaht use of this site into the late nineteenth century and the early twentieth century non-native occupation of the site.

Glass bottle fragments (2) Two water-rolled glass fragments were found in the upper levels of EA 3. One is pale green in colour, with a thickness (0.55 cm) and curvature that suggest that it is from a full-sized bottle. The other is a small fragment, deep cobalt blue in colour, that appears to be from the base of a very small bottle or vial. Cobalt blue was commonly used for historic glass, including medicine and cosmetic containers (Jones and Sullivan 1989:14). Part of a circular indentation is visible on the bottom of this small fragment. This may be the remnant of an "Owens suction scar," a distinctive mark indicating machine manufacture of standardized shapes, which would place this object after 1904 (Jones and Sullivan 1989:37).

Features

Hearths (11)

Concentrations of fire-cracked rock (FCR) and charcoal, presumably the remains of hearths, made

up the largest category of features recorded in the village area. Five such features were recorded in EA 1, with three each from EA 2 and 3. They were found in almost all layers of the site, from the uppermost stratum to the original beach sands at the base of the deposit. Charcoal collected from a hearth in the sand at the base of the EA 1 trench yielded a date of 1870 to 1560 cal BP (Fig. 40).

Some circular FCR concentrations, with charcoal and bone present, seem clearly to mark the presence of *in situ* hearths. The three from EA 3, for example, appear to be hearths on possible house floors (Fig. 41). Two of these were found at the same level, just over a metre apart. A few others in this category, however, are more amorphous clusters and may represent "dump" episodes, where broken rocks and charcoal from hearths have been redeposited in the midden. This is particularly true of those in EA 1, where loose shell deposits suggest discard activities.

Concentrations of large rocks (5)

Unlike the previous category, rocks in this group tend to be larger, unbroken and rounded. Piles or concentrations of such rocks are assumed to reflect cultural activities, but their functions are not usually evident. Two were found in EA 1 and three in EA 2. They occurred from the upper layer to fairly deep in the deposit.

In one case, the cluster was associated with three possible post holes among the rocks. In another, a stack of six fairly large rocks (up to 30 cm length) had been placed over the skeletal remains of an immature individual. This occurred in Layer C of EA 1, at a depth of about 1 metre. Only one rock was moved, exposing human remains directly beneath, with no evidence of a burial pit. The rock was replaced and the remains were not further investigated or disturbed. As this occurred in a "step" unit at the end of the trench, the cairn could simply be left and later reburied. In all other cases, the rocks were removed for excavation underneath, without encountering any human remains.

Post holes (4)

A post hole just under the surface of EA 1 had four rocks tightly clustered around it, presumably to brace the post. It is clearly recent and may reflect historic farming or modern camping activity at this site. Two concentrations of post holes occurred at different levels of EA 3, both in the concentrated shell of Layer B. One

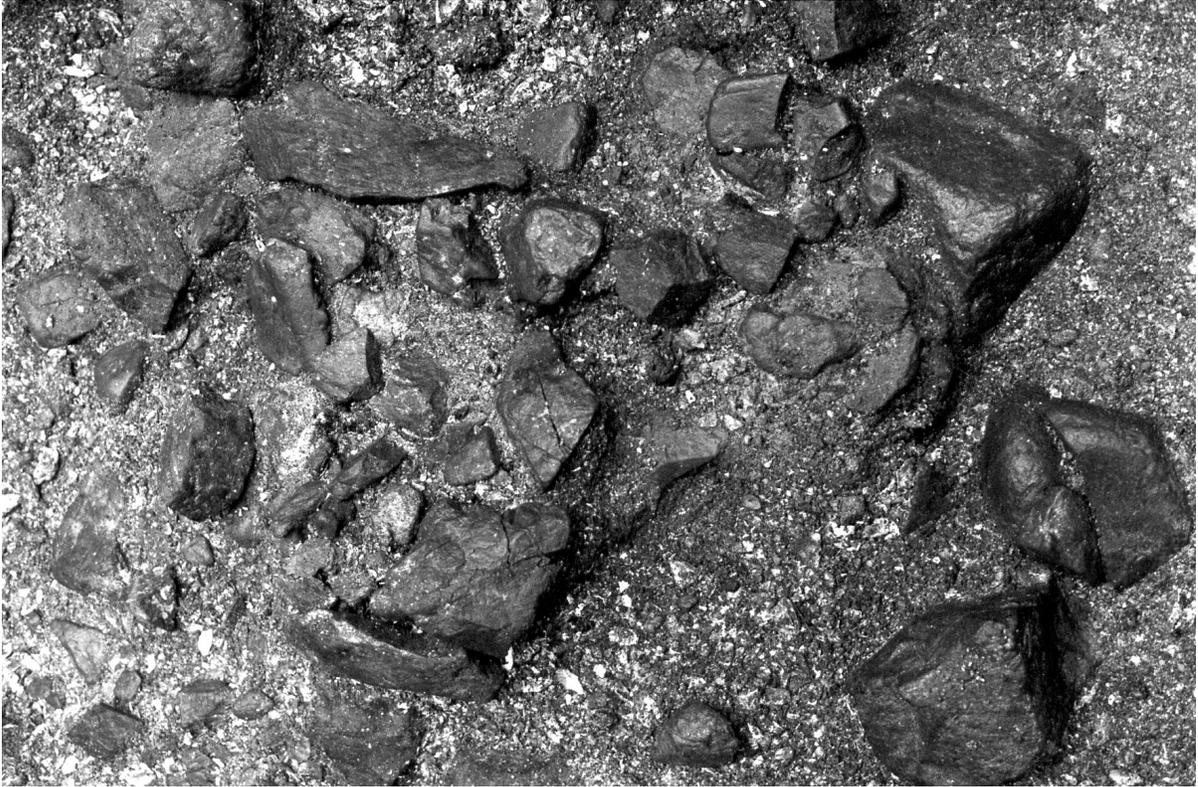


Figure 40. Hearth on basal sand, EA 1, Ts'ishaa (Feature 8 – charcoal from among the rocks provided a radiocarbon date of 1870 to 1560 cal BP).



Figure 41. Intact hearth at EA 3, Ts'ishaa (Feature 20).

consisted of five roughly circular holes, with diameters of 9 to 15 cm, scattered across the unit floor. Somewhat below these, three additional circular to oval holes of roughly the same diameter appeared. The smallest was surrounded by three support rocks.

One additional, but quite different, feature occurred in EA 2, almost a metre below the surface. This is a circular black stain, about 30 cm in diameter, which extended from the black silt of Layer C into the crushed shell of Layer D. Only in the latter matrix did this feature become visible. It presumably is the mold from a substantial post which once stood in this location.

Several additional post molds, not designated as features, are evident in the stratigraphic profiles. One substantial example in EA 3 extends about 70 cm from the shell of Layer B into the lower strata (Fig. 24). It would have held a post with a diameter of 15 to 20 cm. In EA 2, two post molds were recorded at the back of the middle platform, extending from a possible house floor (Layer C – black silt and FCR) into the underlying crushed shell (Layer D). These molds only became visible in the crushed shell. The two posts were 13 and

18 cm in diameter, with the deepest extending about 30 cm into the shell.

Faunal concentrations (2)

Two large stacks of whale bones were excavated in EA 2. One came from the middle terrace, in Layer C, on what had been noted as a possible house or activity floor. It consisted of seven large bones, concentrated in a pile without any evident order. The elements present, which are not necessarily from the same individual, consist of a complete rib, a complete radius, a vertebra, and fragmentary portions of four other bones, one of which appears to be part of a scapula and another which may be an intermaxillary (Gay Frederick, report to the authors, 2001). DNA analysis on four elements (rib, radius, scapula, and possible intermaxillary) determined that all could be identified as coming from humpback whales (Watt 2003). A radiocarbon sample taken from around this feature provided a date of 640 to 470 cal BP.

A larger concentration of whale bones was encountered on the lowest terrace, extending through Layer C to Layer D (Figs. 42, 43). Examination of



Figure 42. Feature 57, a large concentration of whalebone. The occipital condyles of a whale skull are visible with a mandible lying across it.

the stratigraphy indicates that the two whalebone piles date to about the same time, which is further confirmed by the placement of the second feature above a radiocarbon date of 730 to 550 cal BP. The lower concentration nearly filled the excavation unit and extended into the western wall of the trench (see the stratigraphic profile, Fig. 23). It included a vertebral centrum epiphysis, a phalanx, a chopped rib fragment, a split rib fragment, the posterior portion of a very large skull, a complete left mandible, and the posterior third of a much larger baleen whale mandible (Gay Frederick, report to the authors, 2001). The skull was placed with the occipital condyles pointing upward and the complete mandible resting across it, with the other elements stacked around. Species identification of five elements through DNA analysis revealed that the complete mandible came from a gray whale, while all others, including the much larger mandible fragment, came from humpback whales (Watt 2003). The large size of the skull

and mandible fragment relative to other elements suggests that at least two humpback whale individuals are represented. The flattened anterior extension of the skull's occipital bone, as well as the flattened lateral surfaces of both mandibles, display numerous shallow cut marks. The partial mandible has also been deliberately sectioned and extensively burned. Interestingly, most of a mussel shell harpoon cutting blade was found embedded in the right anterior portion of the skull's occipital bone, placing the harpoon entry wound above and behind the right eye. The shallow angle of entry meant that most of the harpoon blade was still intact in the bone (see discussion under artifacts). Clearly this whale had been taken by harpooning, was butchered on the beach, and later various elements found their way into this stack on the lowest edge of the site, possibly as a memorial to the whaler's prowess or as a convenient source of raw materials. The numerous cut marks on the skull and mandibles indicate that they also served as convenient large cutting boards.



Figure 43. Excavation around the whale bones of Feature 57. A shell harpoon blade was found embedded in the skull at the front lower edge in this picture.

Faunal Remains

Analysis of the shell is reported in Appendix C. For the main village portion of the site, shell analysis was restricted to about one-third of the levels in a column sample collected in the EA 1 trench. A total of 56 species of molluscs, barnacles, chitons, and sea urchins was identified. Throughout, California mussel dominates the shellfish taxa, comprising between 78.4 and 95.3% of the deposit by weight. Acorn barnacles make up the second major constituent by weight, while clams, particularly butter and littleneck clams, came third. Several species of chiton and sea urchin were also important elements of the diet throughout the deposit.

Analysis of the vertebrate fauna is presented in Appendix D. This is based on elements recovered from selected levels of one unit in EA 1 and odd-numbered levels of two adjacent units in EA 2. A total of 43,515 vertebrate elements was examined, of which 20,809 were identified to a specific taxon. Fish dominate the assemblage, comprising between 91 and 98% of all faunal elements, except for the upper layers of EA 2, where sea mammals and birds are more abundant and fish drop to 65% of the total. Of the fish, rockfish species are overwhelmingly the most abundant, comprising between 48 and 81% of the fish elements, except for the upper layers of EA 2, where salmon become more abundant and rockfish drop to 27% of the total. Greenling and ling cod are the other impor-

tant fish species, followed by surf perch. Rockfish, greenling, ling cod, and surf perch are abundant in the rocky nearshore environment immediately surrounding Benson Island.

Although significant numbers of herring and anchovy bones were recovered during troweling and screening through 1/4" mesh, these small fish species were clearly under-represented in the faunal analysis. This problem was addressed through the recovery and analysis of small elements from the column samples (Appendix E). Selected levels from each major stratum in the EA 1 and 2 trenches were examined. Overwhelmingly, the recovered skeletal elements were fish (97.7% in EA 1 and 99.2% in EA 2). Of these, herring was by far the best-represented species, comprising 56.8% of the identified fish in EA 1 and 49% in EA 2. Anchovy also occurred in great numbers, particularly in EA 2. As in the unit samples, rockfish and greenling were also important species. However, the dominance of herring reduces the importance of rockfish to 17.4% in EA 1 and 11.8% in EA 2. These column samples document a similar suite of near-shore marine fish to that recovered in the unit samples, but dramatically increase the importance of small fish, particularly herring and anchovy. The

great concentrations of herring in the protected areas of Barkley Sound brought in a range of other fish, birds, and sea mammals to feed on the spawning masses. These also became prey for human hunters and fishers.

Sea mammals played a significant role in the diet at Ts'ishaa. Fur seals and whales dominate this category, with porpoises and dolphins of several species also well-represented (Appendix D). DNA analysis of ten selected whalebones from EA 2 (nine from the two faunal features described earlier plus one ulna from the east wall) revealed that all but one gray whale mandible were humpback whale elements (Watt 2003). The preponderance of identified humpbacks in the cetacean remains is in agreement with earlier studies in Barkley Sound, such as those of the Toquaht Archaeological Project (Monks et al. 2001). The embedded mussel shell harpoon cutting blade demonstrates that the people of Ts'ishaa were actively hunting whales over 500 years ago, not simply relying on drift whales. The considerable number of porpoise and dolphin remains in the deposit also show that the people of Ts'ishaa had well-developed strategies and technology for hunting such fast-swimming and elusive sea mammals.