Quaternary Research

doi:10.1017/qua.2018.42

SPECIAL ISSUE

ALEUTIANS

The stone and bone artifacts from Asx̂aana-x̂ Cave, Islands of the Four Mountains, Alaska

Lucille Lewis Johnson*

Department of Anthropology, Vassar College, Lagrangeville, New York 12540, USA

(Received October 24, 2017; Accepted April 4, 2018)

Abstract

Asx̂aana-x̂ Cave in the Islands of the Four Mountains, Alaska, was excavated in 1990. The cave contained the remains of Unangan mummies and their grave goods including textile, wood, bone and stone artifacts. These mummies were buried between AD 1250 and AD 1780-1790. The mummies were distributed in three distinct areas in the front, middle and back of the large cave. The textile and wooden artifacts and their distribution have been described in earlier publications. The stone artifacts include end blades, adzes, ulus and hammerstones plus an oil lamp and a small figurine; among the bone artifacts are whale bone planks and scapulae, rods and shafts, harpoon heads and labrets. These artifacts are typical of artifacts in the Aleutian Islands, while their distribution continues to strengthen the idea of a disjunct distribution of artifacts in the cave, which I interpret as being due to different social groups using the three areas of the cave for their burials.

Keywords: Aleutian Islands; Unangan people; prehistory; burial practices; stone artifacts; bone artifacts

INTRODUCTION

Asx̂aana-x̂ Cave is a large Aleut burial cave in the Islands of the Four Mountains. The only comparable cave burials known to date in the Aleutians are two on Kagamil Island, which were excavated, with little to no stratigraphic control, by Ales Hrdlička (1945) in 1936. The dates from the burials and the associated burial goods suggest that Asx̂aana-x̂ Cave contains the remains of Neo-Aleuts who entered the islands around 1000 cal yr BP (Coltrain et al. 2006; Coltrain, 2010; Crawford and West, 2012)

Asx̂aana-x̂ Cave was excavated in 1990 under my direction with permission from the Aleut Corporation and in cooperation with the U.S. Fish and Wildlife Service (USFWS). The cave, 30 m asl, measures 18 m by 12 m and is about 5 m tall at the front (Fig. 1). The cave was divided into 2 m squares, lettered from A to I from the mouth of the cave inward and from 0 to 6 beginning at the NE corner. Each grid was then divided into 1 m grids labeled with the cardinal directions. Three areas of the cave were excavated: the north front area, the south rear area, and a middle section. The deposits included at least 36 mummies and their associated burial goods. The deposits had been chewed and disarranged by foxes, which had been living in the cave for at least 50 yr. This is the third paper on the artifactual remains recovered from the cave: Elizabeth Wilmerding (1993) analyzed the textiles; I have published on the wooden artifacts (Johnson, 2016), and here I will discuss the stone and bone artifacts from the cave. Following the excavation, the skeletal remains were taken to Connecticut College to be analyzed by William Laughlin; after a year they were reburied at the behest of the Aleut Corporation at the Chaluka site on Umnak Island. No report was produced by Laughlin.

Three main deposits of mummies were encountered in the cave: a major deposit in the front (19 mummies) and smaller deposits in the back (7 mummies) and center (10 mummies) of the cave. As discussed in Johnson (2016, pp. 114, 138), both the depredations of the foxes and the absence of a final report on the human remains have made the association of the artifacts with individual mummies difficult to untangle, except in the rare case of a lip plug associated with a jaw or a projectile point found in a chest cavity.

All of the textiles from Asx̂áana-x̂ Cave were manufactured by twining, using 12 methods of the 44 identified by Adovasio (1977). Of the 25 pieces that have decorative elements, Wilmerding states:

> The majority of decorative elements occur as changes of color and the use of false embroidery in the weft rows. There is a single example of the use of contrasting

*Corresponding author at: Department of Anthropology, Vassar College, 144 Velie Road, Lagrangeville, New York 12540, USA. E-mail address: johnsonl@vassar.edu (L.L. Johnson).

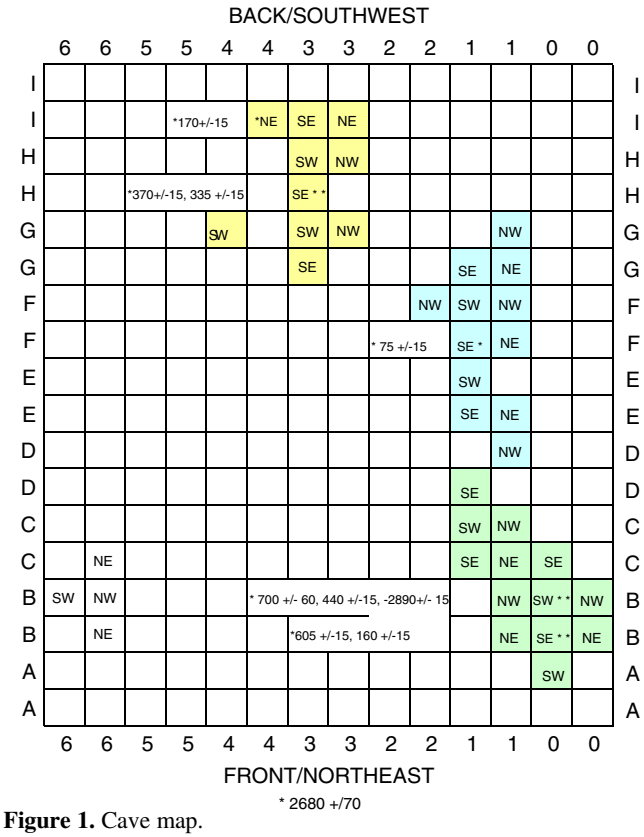

Figure 1. Cave map.

warps. The simplest decorative element is the use of a contrasting black weft element in as few as one row or as many as three adjacent rows on either simple or diamond twined pieces. False embroidery also occurs in both simple and diamond twined textiles but is actually woven onto rows of simple, close twining primarily, and diamond close twining occasionally. It is never woven onto open twined rows in . . .[Asx̂aana-x̂]. . .cave collection.

False embroidery is used in a number of the pieces and appears in red and yellow only. Red false embroidery appears more often than yellow, and yellow appears usually as an accent in the shape of a geometric or linear figure on a background of red. Yellow diamonds and rectangles appear within bands of red and black rows, and in a single instance narrow yellow bands form both horizontal and vertical patterns against a red background. False embroidered patterns always seem to end before reaching the selvage edge, but it is unclear whether this is a technical necessity or a conceptual one.

Symmetry of a design can occur within a decorative band and between decorative bands. Mirror symmetry from the top of a decorative band to the bottom occurs the most often and asymmetry occurs only very rarely. Mirror symmetry can be defined as the repetition of a design around a central row (1993, p. 57).

The distribution of these textiles is disjunct: the rear uniquely contains Adovasio textile types 14 and 37 and the only examples of warp preparation in the cave. The center has the preponderance of decorated textiles and is the only area to have Adovasio types 4, 7, and 20. It has black wefts of contrasting material on several textiles and also a backward construction technique (Wilmerding, 1993). Finally, the front has relatively few textiles. The sparse textile remains in the front may be due to poor preservation.

Wooden artifacts from Asx̂áana-x̂ Cave (Johnson, 2016) include planks, shafts, bentwood bowls and baskets, baidarka pieces and paddles, mask pieces, labrets, netting tools, "pillows," carved wooden bowls, a pair of tweezers, and miscellaneous fragments. Most common were shafts and baidarka pieces, followed by mask pieces, bentwood pieces, and planks. Shafts, baidarka fragments, and bentwood pieces were most common in the front region of the cave, mask pieces and planks in the middle, and masks and bentwood in the back. All the carved wood, the bowls, and the netting tools, were found in the back, the visor and the wedge in the middle, the three wooden labrets or toggles in the front and back, and the pillows in the front and back.

The dates of the remains (see following section) place these internments after the arrival of the Neo-Aleuts in the Aleutians, and their mummification suggests that they are Neo-Aleuts (Coltrain et al., 2006; Coltrain, 2010; Crawford and West, 2012). The presence of whale bones in the cave suggests a diet high on the food chain. The skeletons have been reburied and are unavailable for isotope analysis. The textiles in the cave are quite similar to those from the Kagamil burial caves (Wilmerding, 1993), and the wooden artifacts are most similar to those of Kodiak to the east, from whence the Neo-Aleuts appear to have come. This study of the stone and bone artifacts of Asx̂aana-x̂ Cave completes the analysis of the material remains emplaced with the mummies and allows an understanding of the sorts of objects interred and their distribution within the cave.

DATING

Textile fragments from Asx̂aana-x̂ Cave were recently dated by the Keck Carbon Cycle AMS Facility (Table 1), adding to the two earlier dates run by Beta Analytic (Table 2; see Fig. 1). The dates in the front/NE and the back/SW are in correct stratigraphic relationship to each other. The bundle from the central area of the cave, S135, has the most recent date, 75 ± 15 ^{14}C yr BP (UCIAMS-183608). This bundle was on the surface and quite coherent, so was probably the last mummy emplaced in the cave, but it seems quite improbable that it was emplaced in 1875, given that there is no indication of European or Russian artifacts in the cave, but see the "Discussion."

The next most recent dates come from surface deposits in both the front and back of the cave. These dates, 160 ± 15 ^{14}C yr BP (UCIAMS-183612) from the front of the cave, and 170 ± 15 ^{14}C yr BP (UCIAMS-183610) from the back

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

Table 1. Radiocarbon dates from AMK-009 in the Islands of the Four Mountains.

Site	Unit	Layer	^{14}C date (BP)	Lab No. (UCIAMS)	Calibrated 1 sigma, Calib 7.1.0	Calibrated 2 sigma, Calib 7.1.0	Material
AMK009	#1 OBSE	A242	605 ± 15	183606	556–564 (19.3) 589–607 (40.7) 624–641 (40.0)	550–568 (20.6) 583–648 (79.4)	Fabric
AMK009	#2 OBSW	A172	440 ± 15	183607	501–511 (100.0)	493–518 (100.0)	Matting
AMK009	#3 IFSE Bundle S135	A79	75 ± 15	183608	38–63 (74.3) 118–123 (7.7) 232–242 (17.9)	33–73 (62.0) 99–105 (1.1) 114–136 (14.9) 225–253 (22.0)	Fabric
AMK009	#4 3GSW/3HSE-2		370 ± 15	183609	334–349 (30.2) 439–444 (7.0) 453–485 (62.8)	330–359 (28.6) 367–373 (1.0) 429–498 (70.4)	Fibers
AMK009	#4a 31NE	A034	170 ± 15	183610	7–14 (9.9) 146–151 (8.0) 171–189 (29.5) 193–213 (33.2) 268–280 (19.5)	0–23 (18.4) 142–154 (9.7) 168–219 (54.8) 265–283 (17.1)	Assoc w/ S050
AMK009	#5	A070b	335 ± 15	183611	318–334 (21.5) 349–393 (58.0) 425–438 (17.5) 448–451 (3.0)	315–343 (20.5) 346–312 (49.8) 418–464 (29.6)	Matting under S92
AMK009	#6 OBSE	A122	160 ± 15	183612	10–21 (18.5) 143–150 (10.7) 174–178 (6.9) 184–217 (53.5) 266–273 (10.4)	3–30 (19.2) 139–153 (11.2) 169–222 (53.1) 259–282 (16.5)	Fibers
AMK009	#7	A176	"-2890 ± 15"	183613	Sample AMK-009 A176 contains excess ^{14}C, probably from mid 20th century atmospheric thermonuclear weapons tests.		Fine matting 19mgC

of the cave, shortly postdate the 1764 killing of the men of Chuginadak, the removal of the women to Umnak, and the destruction of the village on Ulyagan (Carlisle) by Stepan Glotov (Veniaminov 1984 [1840]). They would, thus, represent the final use of the burial cave by the residents of the Islands of the Four Mountains in the protohistoric period.

Table 2. Beta Analytic dates.

Beta Analytic Inc. October 23, 1990		
Our lab #	Your sample number	^{14}C Age years BP +/- 1
39962	0BSW - S80	700 +/- 60 BP (charcoal)
39963	Test Excavation Layer 2	2680 +/- 70 BP (carbon Sediment)

These dates are reported as RCYBP (raeiocarbon years before AD 1950). By international convention, the half-life of radiocarbon is taken as 5568 years and 95% on the activity of the National Bureau of Standards Oxalic Acid (original batch) used as the modern standard. The quoted errors are from the counting of the modern standard, background and sample being analyzed. They represent one standard deviation statistics (68% probablility), based on the random nature of the radioactive disintegration process. Also by international convention, no corrections are made for DeVries effect, reservoir effect, or isotoope fractionation in nature, unless specifically noted above. Stable carbon rtios are measured on request and are calculated relative to the PDB-1 international standard; the adjusted ages are normalized to -25 per mil carbon 13.

The next four dates are prehistoric. In the back of the cave, two dates close in time come from overlapping deposits and suggest that this area of the cave was used for burials primarily in the late sixteenth to early seventeenth centuries (370 ± 15 ^{14}C yr BP [UCIAMS-183609] and 335 ± 15 ^{14}C yr BP [UCIAMS-183611]). The front area of the cave was the first area used for mummy burials, beginning in AD 1250 (700 ± 60 BP [Beta 39962]) and extending to AD 1345 (605 ± 15 ^{14}C yr BP [UCIAMS-183606], 440 ± 15 ^{14}C yr BP [UCIAMS-183607]). As mentioned earlier, the front and back areas of the cave, and possibly the central area, were last used in the time of Glotov. The dates suggest that Asx̂áana-x̂ Cave was first used for burials about 200 yr after Kagamil and continued in use longer: Kagamil AD 1034–1546 (Coltrain et al. 2006), Asx̂áana-x̂ AD 1250–1615 plus a reuse in the 1780s to 1790s. The earliest date for the Asx̂áana-x̂ deposits, 2680 ± 70 ^{14}C yr BP (Beta 39963), comes from a test excavation on the slope outside the cave mouth, which produced one unfinished projectile point and a few retouch flakes and probably represents a use of the cave for shelter before it began to be used for burials.

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

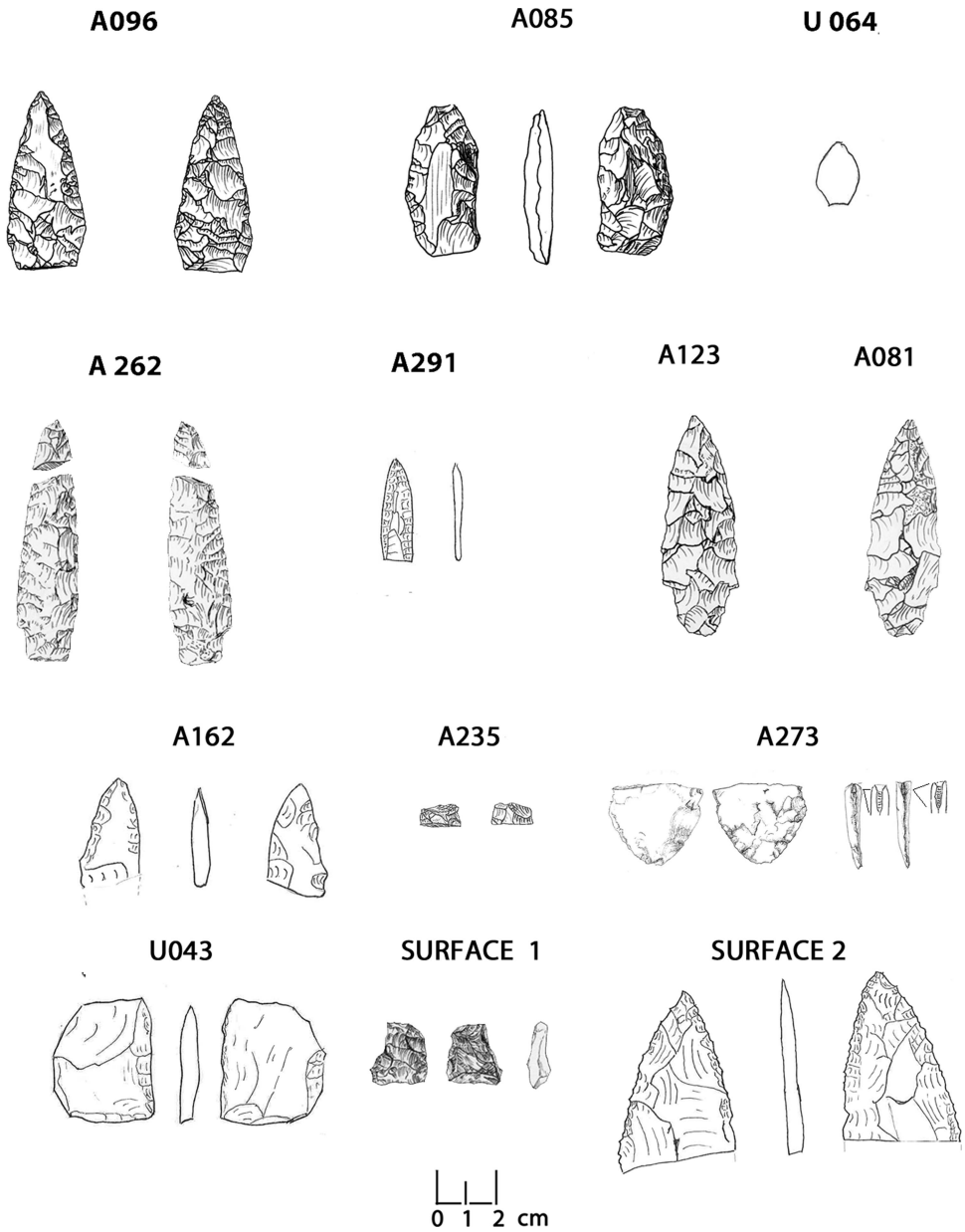

Figure 2. End blades/points.

STONE ARTIFACTS

One hundred and twenty-three lithic artifacts were found in the burial area in Asx̂aana-x̂ Cave. The majority (69) of these were found in the front section of the cave, and most of these (54) were retouch flakes (Supplementary Table 1). These may belong to the living site discovered in a 1 m^2 test pit in the talus slope just below the mouth of the cave, which revealed lithic debitage and a partially completed projectile point. The cultural layer in this test pit dates to ca. 3000 yr BP. This suggests that, before the use of the cave for burials, the well-lit front section of the cave was used as a living site. Twelve end blades were found in the cave, four of which were of obsidian, while 23 of the 70 flakes were obsidian. End blades are more common in the front of the cave, suggesting that some of them also belong to the living site rather than to the cemetery.

Bifaces

There are 12 end blades, or points, from the cave plus one from the talus slope (Fig. 2, Supplementary Table 2). Six of the points found in the cave are essentially whole, missing only tips. At the very front of the cave, within the chest cavity of a mummy, was a long, narrow green obsidian point (A096). A085 is a ground and then crudely chipped point.

Two essentially complete points were found in the middle area. The first (U064) was found in association with a mummy and matting. It is a small, oval basalt end blade, the right basal

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

width but a little thick to fit into the toggle harpoon heads found in the cave (see below), though it would have fit into a similar slotted foreshaft. The chipping is hard to see, but one side has very fine marginal retouch, while the other side has larger flake scars visible. A complete but broken basalt point (A262) is fully bifacially retouched, lanceolate in shape, with a square stem. It was found in the screen from dirt just below a group of three fragmentary wooden shafts.

From the back area, a long, narrow obsidian point with its proximal end snapped off (A291) resembles what Maschner and Reedy-Maschner (1998) call a people killer point. It has very fine, even marginal pressure retouch on all edges and was made on a thin flake or blade whose surface is visible in the center of both faces of the point. A well-made point of fine-grained basalt (A123) was found in association with wooden objects and a mummy. The last whole point from the cave (A081) is a stemmed triangular point, with full bifacial retouch, found inside the sacrum of a mummy, in line with lumbar vertebrae 5, 4, 3, and 2. The last biface from the rear area (A162) is the distal portion of a roughly chipped basalt point. Its unevenness suggests that it broke during manufacture

Additional biface fragments were found in the front area of the cave. A tiny midsection of an obsidian biface (A235) was found in association with an ulu (A165; see *Ulus* in following section Ground Stone). A burinated bifacial base of andesitic basalt with plagioclase inclusions (A273) was probably associated with a mummy bundle. Burinations run down the margins from both sides of the break and may be coincident with it. The burin facet on one side shows no indication of use; the other side has some crushing, which may indicate use. The final biface found in excavation (U043) was found near a mummy bundle deep in the deposit. It is a broken basalt biface with six flakes and five chips from its manufacture plus five obsidian bits: two pressure flakes, two small flakes, and a chunk associated (see Supplementary Table 1). The biface was clearly broken in manufacture. Three additional tiny pressure flakes were found during cleaning in the lab. This point may be associated with the earlier campsite rather than the burial activities.

Two fragments, which did not receive individual numbers, were found on the surface. The first (surface 1) is a proximal corner of a well-made obsidian point. The second (surface 2) is the distal portion of a finely flaked point of andesitic basalt with plagioclase inclusions.

Edge-retouched pieces

Five artifacts from the front of the cave and one whose provenience is lost may or may not have been retouched (Supplementary Fig. 1, Supplementary Table 3). The "Provenience Lost" piece is questionably an artifact. It is a piece of granular granodiorite which might or might not be retouched. Similarly, A235-2 is a point-shaped piece but may just be roof fall. Two pieces, A277-1 and A277-2, were found on a shelf of stone above 0BSW along with flakes and chips of obsidian and basalt. A277-1 is retouched from both edges toward the center on the proximal end and lightly retouched on that side toward the tip; the other side has steep marginal retouch all along the right edge and on the upper part of the left edge. It might be a knife, scraper, multifunctional tool, or unfinished point. A277-2 has bimarginal retouch on one lateral edge and minor chipping, possibly from use on one side of the other edge. A283-1, which is broken, has bimarginal retouch on one edge and alternating unimarginal retouch on the other edge. Finally, A180 is a minimally chipped basalt tool.

Ground stone

Adzes and ground point

A ground stone point base and three adzes were found in the excavation (Supplementary Fig. 2, Supplementary Table 4). The fully ground point base (A023) is made of light gray andesite with hornblende needles. Both surfaces and the base are ground flat, the side edges are ground sharp. No hafting marks are visible on the base or the sides. It is associated with a mummy in the front of the cave.

The three adzes were found in the rear areas of the cave. The first (A112) is a nicely ground and polished adze made on a green, cherty, metamorphosed argillite. The bit is asymmetrical, and there is use damage on the bit and the distal edge on the shallower bit side.

Two larger adzes from the back of the cave also have ground edges and various amounts of grinding on their surfaces. The first is an adze of dark greenish basaltic andesite or andesitic basalt (A109). One long edge is ground flat, the other rounded. Both short edges have bits; one is sharp and more steeply beveled, the other is more rounded, more shallowly beveled, and damaged. The surfaces are minimally ground, the edges more finely ground. The obverse face is polished near the sharp-beveled end; the reverse face has a pecked area, part of which is highlighted by white residue.

The second (A174) is a flat slab of gray/tan fine-grained andesite with hornblende inclusions. One surface is unworked, the other ground flat. Three edges are definitely worked; the fourth may be worked or broken. The base is pecked flat and is 0.8 cm thick, one side is smoothed into an elegant curve, and the top is ground to a working ulu-like edge. The end was chipped and ground to thin it, and the edge was then finely ground. It shows signs of heavy use. The final side is straight, almost perpendicular to the base, and looks like it has been broken. The tip of the point at the top of the curved end has broken, so its exact form and function are unknown.

Ulus

Six ground stone knives or ulus were found in the cave (Fig. 3, Supplementary Table 5). A016-1, found under a bentwood box bottom in the back of the cave, and A105, found in the front of the cave, are both fragments of fully polished ulus, the first of welded rhyolitic tuff, the second slate. Their working edges are finely ground and lightly curved. A016-2, made of silicified mudstone or tuff, found adjacent to A016-1, and A063, of slate, from the front of the cave are chipped and ground ulus, with one face chipped and the other ground both on the surface

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

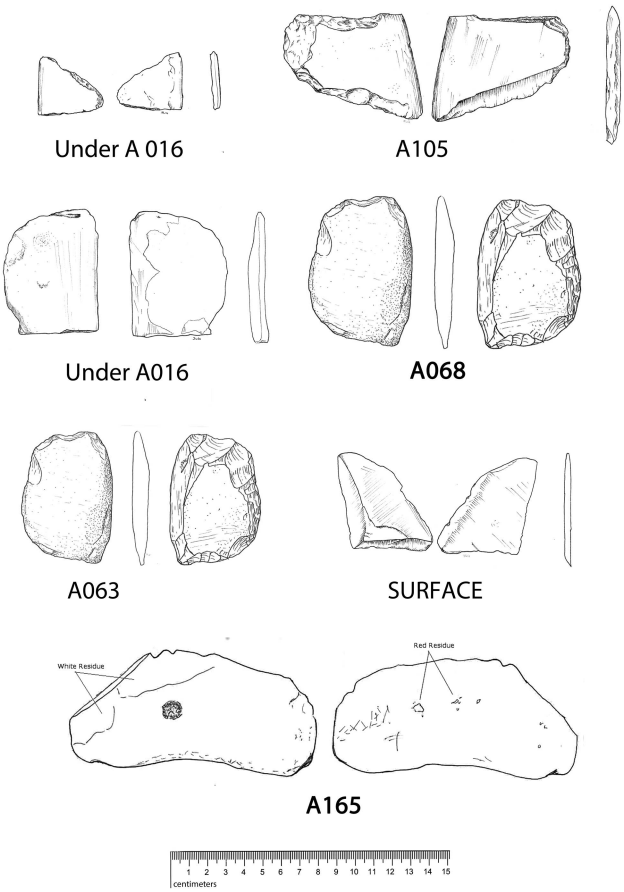

Figure 3. Ulus.

and the edge. The ground edge of Under A016-2 is straight, that of A063 is curved. Found on the surface, a small slate fragment has grinding on both surfaces and an edge, but is too fragmentary to determine anything about its overall original shape. The final ulu (A165), of felsite (or metamorphic siltstone pyroclastic), is concave bladed and crudely worked. The body is roughly ground, the edge more finely ground, the back chipped and slightly broken on one edge.

Slabs

Two sets of flat tabular stones came from the back of the cave (Supplementary Fig. 3, Supplementary Table 6). The first (A187, A193, A200B) is a flat piece of welded rhyolitic tuff with a finely worked section of edge remaining. The three fragments are quite different in appearance, as A193 is medium brown in color while A200B is light gray. The length of the remaining worked edge is 2.45 cm and is slightly damaged, probably by use. The surfaces show manufacturing stria parallel to the worked edge. These fragments are very similar in appearance to the group below and come from the same area, and all may have been part of the same artifact.

The second group comprises four thin tabular pieces of stone (A164, A188B, A189, A200A), which are parts of one large artifact. These show no sign of work, but possible burning. They seem very thin for griddle stones, but might have been used for preparing herbs or pigments. Alternatively, they might form a lid for a bowl or box or a face covering for the dead. These do not mend to the group above.

Abraders

There are nine abrading stones in the collection (Fig. 4, Table 3), three from the middle area and seven from the back. A roughly conical piece with facets (A067) and another one (A068), flattened on one surface with small, 3-mm-wide grooves, pointed by working on the edge and with striations on its irregular surface, were both found in the same square in the middle area and are not illustrated. Another abrader (A092), of an indurated tuff, is nicely shaped and associated with the oil lamp (A093) in an adjacent square. Two abraders from the back of the cave (A185A, A191) are similar to A092 and made of similar material. These are all flat on the top and bottom, thick, with vertical edges. Two others (A182B, A196) are more irregular in shape and made of a lightweight friable tuff. The sixth (A163) is a red pumice abrader, and the seventh (A190) a kidney-shaped one of the same material as the first three illustrated.

Figure 4. Abraders.

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

Hammers

There are three hammerstones in the collection (Table 4, Supplementary Fig. 4). One hammerstone (A110), from the front of the cave, is a very small dense black pebble with pecking on both ends. The second (A118), from the back of the cave, has both ends and faces pecked. A third artifact (A067), from the middle of the cave, is an elongated oval pecking stone of indurated tuff.

Oil lamp

The oil lamp (A093; Fig. 5, Table 5), mentioned earlier, is a pecked piece of basalt with pyroxene inclusions. It comes to a point on one end and is rounded on the other, with one side straight and the other convex. The bottom is slightly convex, the sides vertical, the rim 1–1.5 cm wide and the basin 1.5 cm deep. The rim is broken near the point and near the maximum curve of the convex side.

Figurine

A small figurine (A288; Fig. 6, Table 5), probably buried with a mummy in the front of the cave, is made of a tan volcanic stone. The small oval stone has a groove near one end demarking the face, the features of which are scratched into the surface. Small figurines have been found from Port Moller in the east to Amaknak in the west and have been interpreted in various ways (Dall, 1878; Jochelson, 1925; Laughlin 1963, 1980; Black, 1982, 2003; McCartney 1984; Lee 2006; Insoll 2017). Waldemar Jochelson (1925, p. 95) found two quite crude examples on Umnak Island that he interpreted as amulets used in divination. William Laughlin (1980, p.110) reports that small figurines were called *kaathaagaathagh*, translated as "the image of the deity." He

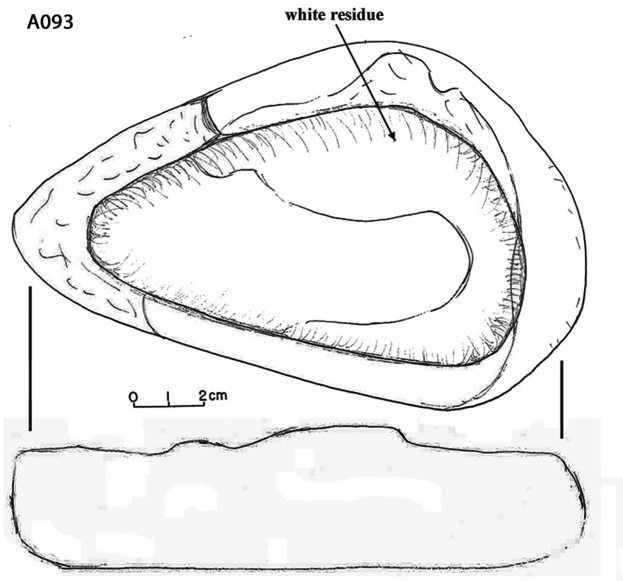

Figure 5. Oil lamp.

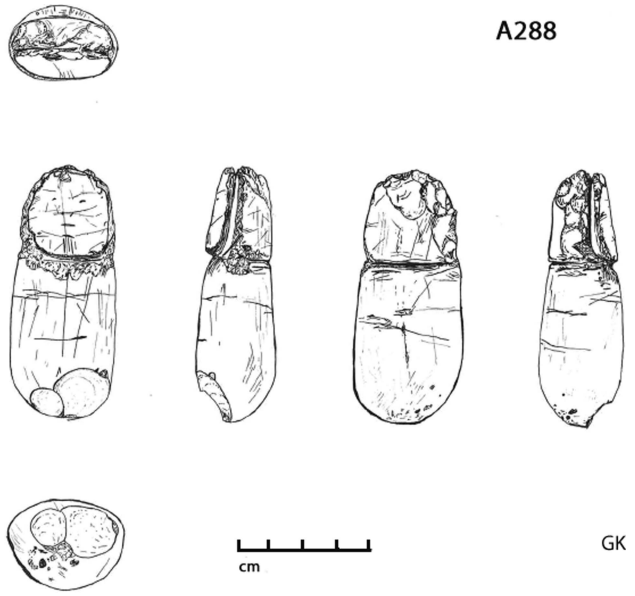

Figure 6. Deity. GK are the initials of illustrator Gail Krovitz.

continues, "A key feature is the vertical girdle about the head by which they were suspended from a ceiling beam in the house. The hunter spoke to the image before venturing out on the ocean and the image spoke back with useful information about weather and the hunt." The Asx̂aana-x̂ Cave figurine is most similar to the "Jowly Man" found at Amaknak D in 1971 by a University of Michigan team led by T. P. Bank (Black 1982, p. 8, 2003, p. 26), although it does not have "the long elegant nose and arched eyebrows," of the Amaknak figurine or the Okvik figurine to which Black compares it. It does not resemble the scratched pebbles or the shaman's doll from Kodiak (Steffian et al., 2015).

Griddle stone

A broken griddle stone (A222; Table 5, Supplementary Fig. 5) from the front of the cave may be attributable to the early campsite. It appears to be fine-grained basalt and shows clear signs of burning on one surface.

Spall

The final possible lithic artifact is a basalt or andesite spall (U043; Table 5, Supplementary Fig. 5), which almost looks like a blade. It does not have a point or bulb of percussion, but the curvature of the ventral surface is very suggestive.

BONE ARTIFACTS

Asx̂aana-x̂ Cave contains bones that are definitively artifacts, bones that have been brought into the cave to serve as sepulchral furniture, and bird bones that are difficult to interpret due to the activities of foxes. Foxes gnawed at the mummies and their bundles, disrupting the order of the remains and resulting in the majority of the textiles being in

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

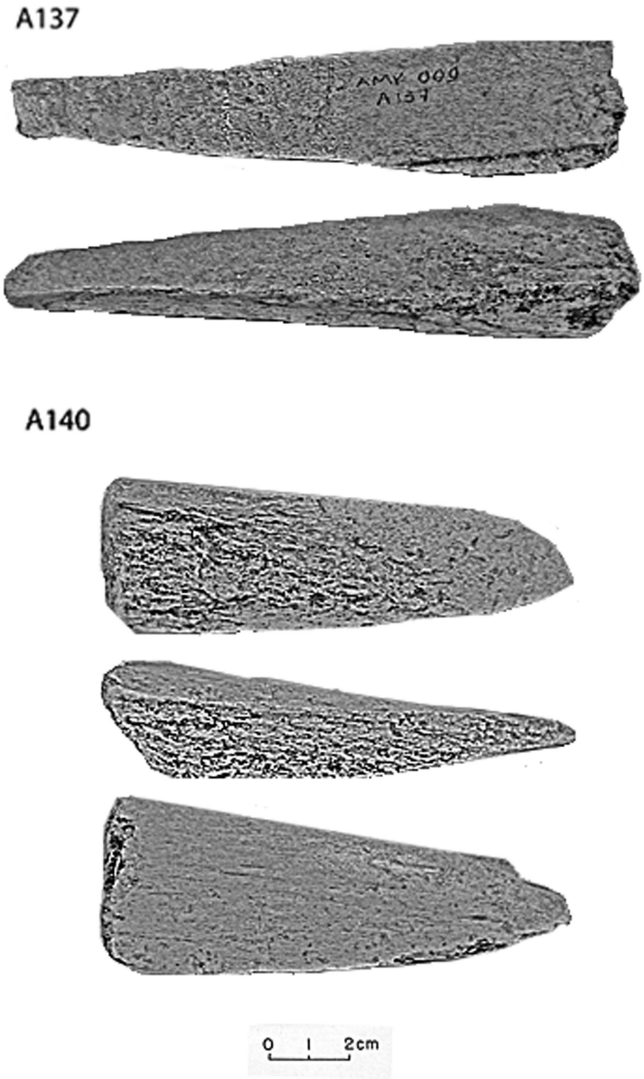

Figure 7. Whalebone wedges.

pieces (Wilmerding, 1993). At the Kagamil Caves, the textiles were recovered in complete rolls, and the mummies were still wrapped in their bundles. In addition, bird bones and feathers were found in clear cultural association (see Hrdlička, 1945, fig. 172; Johnson, 2016, fig. 22). At Asx̂aana-x̂ Cave, some of the bird bones are in positions suggesting the possibility of cultural placement, but others are clearly the remains

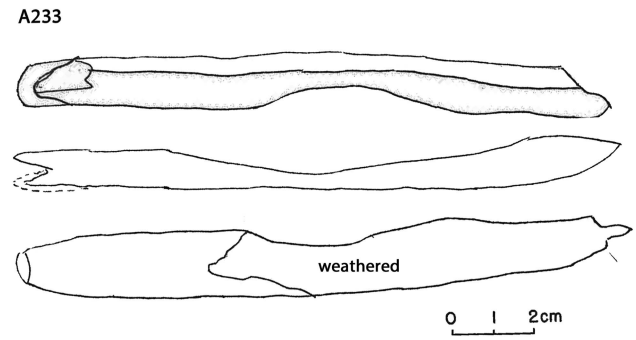

Figure 8. Harpoon shaft.

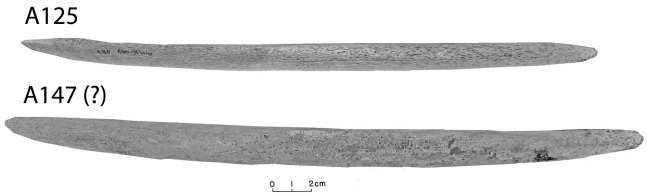

Figure 9. Bipoints.

of fox dinners, and determining what each represents is impossible. As far as unworked mammal bones are concerned, unworked smaller sea mammal bones may have been brought into the cave by the foxes, but the large whale bones were clearly emplaced by people, regardless of whether or not the bones have signs of human modification. The dimensions of all bone artifacts can be found in Table 6.

Whale bone

Whalebone artifacts were found in the back and front areas of the cave. In the back, there were two whalebone planks, each roughly 1 m long, resting on rocks and forming a sepulcher for the major mummy buried in that area. These were left in the cave. A carved whale bone (A019), from the same area, was possibly a basket lid or bottom. From the front of the cave came two whale ribs (Supplementary Fig. 6), one (A003) quite decayed and the other decorated with intersecting carved lines (A039). On the surface, there were also two whale scapulae, very close to the front of the cave, one with cut marks visible. The scapulae measured 91 by 85 by 16 cm and 63 by 63 by 8 cm and were left in the cave. Smaller whalebone artifacts were two whalebone wedges from the back of the cave (A137, A140; Fig. 7). A137 had a groove near the distal end, probably from manufacture, and A140 had been pounded on the proximal end, probably during use. There were also two undistinguished pieces of worked whale bones, one from the front of the cave and one from the back.

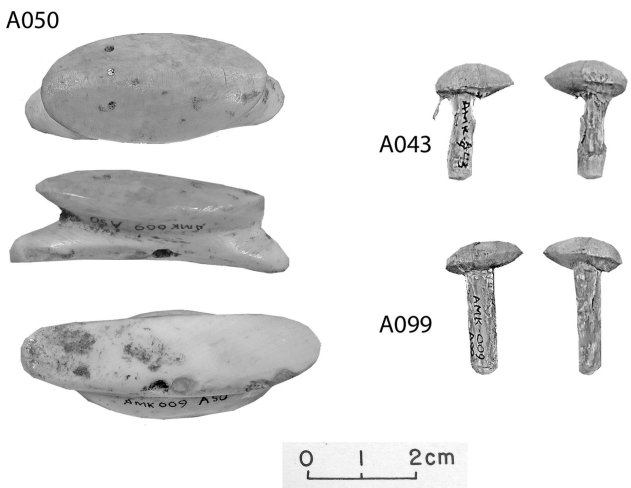

Figure 10. Labret and pins.

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

Figure 11. Harpoon heads.

Rods and shafts

From the back of the cave came a decayed pointed shaft, from the middle a "rod-like bone object," and from the front a possible harpoon shaft (A233; Fig. 8) and two handsome bipoints (the larger of which is actually wooden; A125, A147(?); Fig. 9). The bone bipoint is very finely worked.

Labrets

All probable labrets were found in the same square in the front of the cave (Fig. 10). One is a definite ivory labret (A050) that was found "in association with S70, just to the north of the scapula and below a set of cervical vertebrae. It may well have belonged to S62, which was above it. Thus, S62, which has been bagged with S52, may actually be the head that belongs to S70" (Cave Catalogue, July 30, 1990). Two other, almost identical, possible labrets (A043, A099) of ivory or tooth were found lower down in the same unit, each associated with a mandible, one male and one female. These pieces are quite strange looking, and I have not been able to find their like in the literature. They might be throwing board pegs (Corbett, D., personal communication, June 19, 2017) or box decorations (Davis, R., personal communication, June 23, 2017) or peculiar facial plugs.

Bone pressure flaker

A bone pressure flaker (A042; Supplementary Fig. 7) was also found with the male associated with one of the odd labrets.

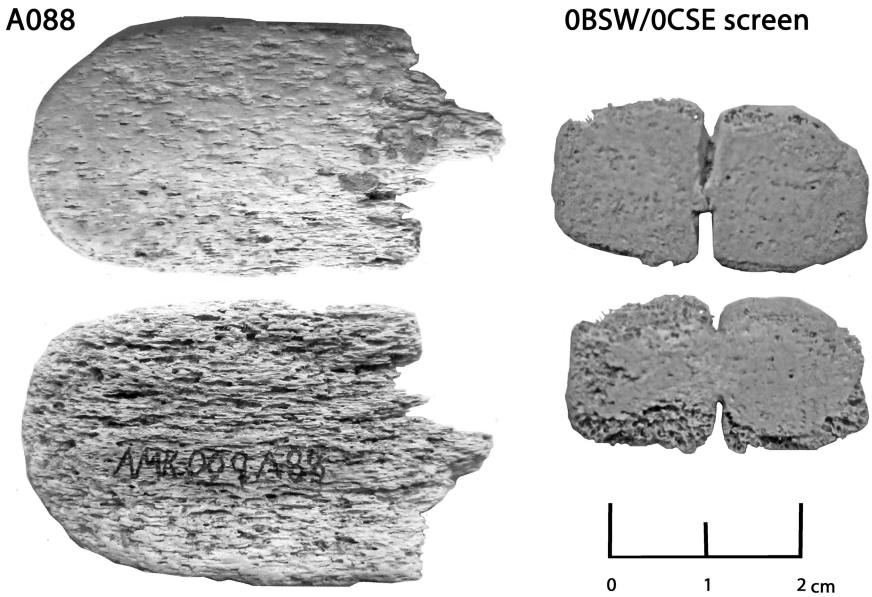

Figure 12. Spatula and toggle.

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

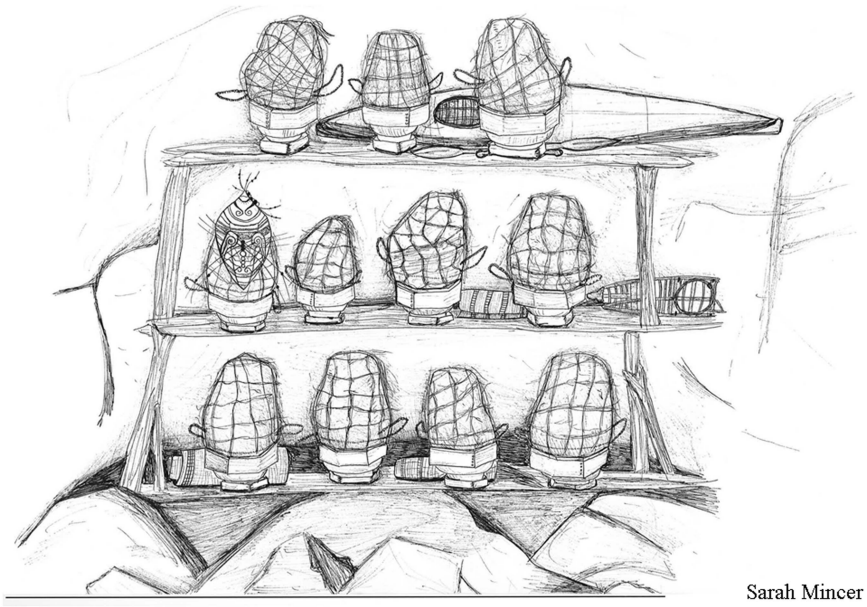

Figure 13. Burials in place. Illustrated by Sarah Mincer.

Harpoon heads

Two toggling harpoon heads (A089, A305; Fig. 11), quite similar to each other, were found in the deposits, one in the back and the other in the front. The one in front was associated with a mummy and shaft pieces; the one in the back deposits also with shafts.

Limpet lever/ceremonial object

A spatulate object was found in the central area of the cave (A088; Fig. 12). It might have been a limpet lever, used to pry limpets from rocks, but given its delicacy, and the prevalence of ceremonial objects in this area of the cave, I think it was probably part of a mask. It is quite similar to wooden mask ornaments from Asx̂aana-x̂ Cave and from Unga (Johnson, 2016, p. 121).

Toggle

A toggle or button (Fig. 12) was found in screening deposits from the front of the cave.

Table 3. Abraders. All units in centimeters.

Provenience	I.D.	Material	L (cm)	W (cm)	Th (cm)	Comments
1DNW	A067	Pumice	9	3.26	2.95	
1DNW	A068	Pumice	10	7.5	5	
1FNW	A092	Indurated tuff	12.3	7.25	3.4	assoc. A093
3ISE	A185A	Indurated tuff	13.5	6.5	5.3	
3ISE	A191	Indurated tuff	12.8	5.3	4.5	
	A182B	Friable tuff	9.1	6	4.7	
3ISE	A196	Friable tuff	8.5	5.5	3	
3ISE	A163	Red Pumice	8	8	5.4	
3ISE	A190	Indurated tuff	12.5	6.5	5.8	

DISCUSSION

Why are so few bone and stone artifacts found in the Islands of Four Mountains burial caves? In prehistoric Aleut living sites, organic artifacts—fabrics, bone tools, and wooden tools—are encountered only when conditions are favorable for preservation. Lithic artifacts, on the other hand, are abundant. For example, in one unit measuring 0.5 by 0.25 m and excavated to 1.35 m below the surface, 7700 lithic artifacts were encountered (Hatfield, V., personal communication, August 3, 2017). In the Islands of the Four Mountains burial caves, fabrics are plentiful, both as mummy wrappings and as burial goods, as are wooden artifacts: boat parts, dishes to hold mummies, and burial

Table 4. Hammers. All units in centimeters.

Provenience	I.D.	Material	L (cm)	W (cm)	Th (cm)	Comments
0BSE	A110		4.5	3.5	3.5	
3GNW	A118		14	10		
1DNW	A067			10	7.5	

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

Table 5. Miscellaneous lithics. All units in centimeters. bkn, broken.

Item	Provenience	I.D.	Material	L (cm)	W (cm)	Th (cm)	Comments
Oil Lamp	1FNW	A093	Basalt	17	10	4	
Deity	0CSE	A288	Tan volcanic	7.2	2.4	1.65	
Griddle Stone	0ASW	A222	Basalt	20(bkn)	17.5 (bkn)	2.7	
Spall	0CSE	U043	Volcanic	13.9	3.1	1.2	

donations. The bones that are found are personal adornments, sepulchral furniture, and weapons. Stones include end blades, some (found in mummy chest cavities) or all of which may have been used to kill the interred individuals, a lamp, and various ground stone tools and grinding stones. The vast majority of lithic artifacts are knapping debris, so they would not be expected in a burial cave. In Asx̂aana-x̂ Cave, the majority of the knapping debris is found in the front area and probably relates to the earlier campsite rather than to the use of the cave for burials.

The back area of the cave, where a variety of grinding stones and ground stone knives are found, is also the location of a set of wooden netting tools (see Johnson, 2016, pp. 133–134). Might these be the personal goods of a master artisan or fisherman?

If one considers that mummy caves may be examples of Aleut conspicuous consumption where the noble dead were interred with scarce and valuable resources, the proportion of various materials may be explained. Wood, in general, is a scarce and valuable resource in the Aleutian Islands. While rushes are plentiful, the amount of labor put into making mats and baskets renders them valuable. Most stone tools found in the islands are utilitarian, easily made from readily available resources. Bone tools, such as wedges and so on, are also easily made from readily available bones from food waste. The whalebone sepulcher and other whale bones may reflect the prowess of buried hunters.

Comparing the three areas of the cave, and reexamining the "disjunct distribution" noted in Johnson (2016, p. 137), stone and bone tools are very sparse in the central area of the cave, which is also the latest area of the cave used for burial and the area with the most ceremonial objects. The spatulate artifact adds to the ceremonial nature of the deposit. The differences between the stone and bone artifacts, as well as the wood and fabric artifacts from the front and back of the cave, do not seem to be due to the different dates at which the two areas began to be used, but rather to personal differences between the groups buried there and to the overlap or mixing of the deposits at the front of the cave with the remains of the earlier occupation.

CONCLUSION

Asx̂aana-x̂ Cave produced a large number of artifacts related to burial practices among the Unangan. While the disruption by foxes and limited information on the burials themselves limit our understanding of the ways in which these artifacts were related to the buried individuals, descriptions of Unangan mummification and burial practices (Dall, 1878; Stout, 1881; Jochelson, 1925; Loeb, 1930; Hrdlička, 1945;

Table 6. Bone Artifacts. All units in centimeters.

Object	Provenience	I.D.	L (cm)	W (cm)	Th (cm)	Comments
Whale rib	0BSE/1BNE	A003	128	19	2	
Whale ib	0BSE	A039	92	23		
Wedge	3GNW	A137	13.1	2.75	2.1	
Wedge	3GNW	A140	11.05	3.45	2.85	
Harpoon shaft	1CSE	A233	15	1.9	1.3	
Bone bipoint	0BSE	A125	30.8	1.7	1.4	
Wood bipoint	1FSE/1FNE	A147(?)	33.7	21	20.5	
Ivory labret	0BSE	A050	4.95	1.5	0.8	Plug
			3.9	2	0.9	Surface
Ivory labret (?)		A043	2.25	5.5	0.5	Overall length, shaft length, shaft diameter
			0.7	1	0.7	Head
Ivory labret (?)	0BSE	A099	2.65	2.1	0.6	Overall length, shaft length, shaft diameter
			1.6	1	0.55	Head
Pressure flaker	0BSE	A042	13	1	0.8	
Harpoon head	3HSE	A089	6.25	1.3	1.2	
Harpoon head	0BNE	A305	6.3	1.8	1.55	
Mask part (?)	1FNW	A088	4.9	2.5	0.65	
Toggle	0BSW/0CSE	screen	3	1.6	0.2	

https://doi.org/10.1017/qua.2018.42 Published online by Cambridge University Press

Bank, 1956), combined with examination of the much more complete but less carefully provenienced artifacts from the Kagamil Caves (Hrdlička, 1945), allow us to imagine what the cave might have looked like at the time it was being used to bury the Unangan noble dead (Fig. 13). The similarities between the remains found in the Kagamil Caves and Asx̂aana-x̂ Cave, such as the carefully prepared mummies wrapped in many layers of twined fabrics and the placing of valuable objects of wood, bone, and stone with the mummies, speak to a general pattern of Unangan mummy burials, but the presence of different and distinct artifacts in the three burial areas of Asx̂aana-x̂ Cave indicates that individuals and families also differentiated themselves from one another. Unlike the wooden artifacts from Asx̂aana-x̂ Cave, many of which showed distinct similarities to artifacts from Kodiak (Johnson, 2016), the stone and bone artifacts do not manifest characteristics that tie them to any place but the Aleutian Islands in general.

ACKNOWLEDGMENTS

The excavation of Asx̂aana-x̂ Cave was supported by the National Geographic Society, Vassar College, United States Fish and Wildlife Service, the Bureau of Indian Affairs, and Robert Adams. Permission to excavate the cave and study the remains was secured from the Aleut Corporation. Dating done by the Keck Carbon Cycle AMS Facility was supported by a National Science Foundation grant (OPP 1301927) awarded to the University of Kansas. Any opinions, findings, and conclusions or recommendations expressed in this article are those of the author and do not necessarily reflect the views of the National Science Foundation.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit https://doi.org/10.1017/qua.2018.42

REFERENCES

Adovasio, J., 1977. *Basketry Technology: A Guide to Identification and Analysis*. Aldine, Chicago, Illinois.

Bank, T., II, 1956. *Birthplace of the Winds*. Crowell, New York.

Black, L.T., 1982. *Aleut Art*. Aleutian/Pribilof Islands Association, Anchorage, Alaska.

Black, L.T., 2003. *Aleut Art*. Revised and Expanded Edition. Aleutian/Pribilof Islands Association, Anchorage, Alaska.

Coltrain, J.B., 2010. Temporal and dietary reconstruction of past Aleut populations: stable- and radio-isotope evidence revisited. *Arctic* 83, 391–398.

Coltrain, J.B., Hayes, M.B., O'Rourke, D.H., 2006. Hrdlička's Aleutian population replacement hypothesis: a radiometric evaluation. *Current Anthropology* 47, 537–548.

Crawford, M., West, D., 2012. Evolutionary consequences of human migration: genetic, historic and archaeological perspectives in the Caribbean and Aleutian Islands. In: Crawford, M.H., Campbell, B.C. (Eds.), *Causes and Consequences of Human Migration: An Evolutionary Perspective*. Cambridge University Press, Cambridge, pp. 65–86.

Dall, W.H., 1878. On the remains of later pre-historic man obtained from caves in the Catherina Archipelago, Alaskan territory and especially from the caves of the Aleutian Islands. *Smithsonian Contributions to Knowledge* 22, 318–366.

Hrdlička, A., 1945. *The Aleutian and Commander Islands and Their Inhabitants*. Wistar Institute of Anatomy and Biology, Philadelphia.

Insoll, T. (Ed.), 2017. *The Oxford Handbook of Prehistoric Figurines*. Oxford University Press, Oxford.

Jochelson, W., 1925. Archaeological Investigations in the Aleutian Islands. Carnegie Institute of Washington, Publication 367, Carnegie Institute, Washington, DC.

Johnson, L. L., 2016. Wooden artifacts from Asx̂aana-x̂ Cave, Islands of the Four Mountains, Alaska. *Arctic Anthropology* 53, 114–140.

Laughlin, W. S., 1963. Eskimos and Aleuts: their origin and evolution. *Science* 142, 633–645.

Laughlin, W. S., 1980. *Aleuts: Survivors of the Bering Land Bridge*. Holt, Rinehart and Winston, New York.

Lee, M., 2006. *Not Just a Pretty Face: Dolls and Human Figures in Alaska Native Cultures*. 2nd ed. University of Alaska, Fairbanks.

Loeb, M., 1930. Descriptions of Fortress Rock mummy bundles no. 4 and 1. In: Weyer, W. M. Jr. *God's Frozen Children*. Doubleday Doran, Garden City, N.Y., pp. 279–291.

Maschner, H. D. G., Reedy-Maschner, K. L., 1998. Raid, retreat, defend (repeat): the archaeology and ethnohistory of warfare on the North Pacific Rim. *Journal of Anthropological Archaeology* 17, 19–51.

McCartney, A. P., 1984. Prehistory of the Aleutian region. In: Damas, D. (Ed.), *Handbook of North American Indians: Arctic*. Smithsonian Institution, Washington, DC., pp. 119–135.

Steffian, A., Leist, M., Haakanson, S. Jr., Saltonstall, P., 2015. *Kal'unek from Karluk*. University of Alaska Press, Fairbanks.

Stout, A. B., 1881. Contribution to the history of the Aleutian Isles, or Aleutia. *Kansas City Review of Science and Industry* 4, 193–200.

Veniaminov, I., 1984 [1840]. Notes on the Islands of the Unalashka District. Pierce, R. A (Ed.), Black, L., Geoghegan, R. H. (trans.). Limestone Press, Kingston, ON.

Wilmerding, M. E. G., 1993. A Comparative Analysis of Textiles for Four Burial Caves in the Eastern Aleutian Islands. Master's essay. Department of Anthropology, Washington State University, Pullman, Washington.