Chipped Stone Technology and the Colonization of the Aleutian Archipelago

Virginia Hatfield

Abstract. Recent research has refined our understanding of the origin and development of the human occupation in the Aleutians through examination of tools and cultural features. Chipped stone technologies, defined by both tools and debitage, can also be used to identify historical and sociopolitical changes based on which technologies are used and how much they are relied upon. Herein, assemblages from recently excavated sites in the western and central Aleutians, dating to ca. 3000 B.P. and 6000 B.P. respectively, are compared to assemblages in the eastern Aleutians, dating between 3000 and 9000 B.P to evaluate whether the record suggests historical continuity or discontinuity. The changes in chipped stone tool manufacture through time that are highlighted by this analysis reveal evidence of population expansions and interactions that occurred in the Aleutians prior to 3000 B.P. Based on the presence of certain technologies, historical continuity is established among the eastern, central, and western Aleutian sites.

Introduction

Recent research in the eastern and western Aleutians has provided a well-defined sequence of occupations in the eastern Aleutians, extending to 9000 calibrated years before present (cal B.P.), and a good understanding of the occupations in the central and western Aleutians (Corbett et al. 2001, 2010; Davis and Knecht 2010; Hatfield 2006, 2010; Knecht and Davis 2001; Lefèvre et al. 2001; O'Leary 2001; Veltre 2001; West et al. 1999, in press). Using this body of information, comparisons of eastern, central, and western Aleutian sites can be conducted in order to test current theories regarding the peopling of the Aleutians. These theories range from the proposal of expansion of a single cultural tradition that subsequently developed in isolation to ideas concerning multiple population expansions and/or cultural diffusions that may or may not have resulted in the replacement of earlier populations.

In this analysis, the chipped stone technologies from ATU061 on Shemya Island, in the western Aleutians, and from ADK171 on Adak Island, in the central Aleutians, are compared to lithic assemblages recovered from a sequence of sites (UNL050, UNL048 Levels 2–4, UNL318, and UNL115) in the eastern Aleutians, on or near Unalaska Island (Fig. 1). The presence and frequency of blade, microblade, and bifacial technologies at each of these sites are used to identify historical continuity or discontinuity. Historical continuity has previously been demonstrated by comparing

Virginia Hatfield, Prewitt and Associates, Inc.
3207, 29th Street, Lubbock, Texas 79410
Department of Sociology, Anthropology, and Social Work
Texas Tech University

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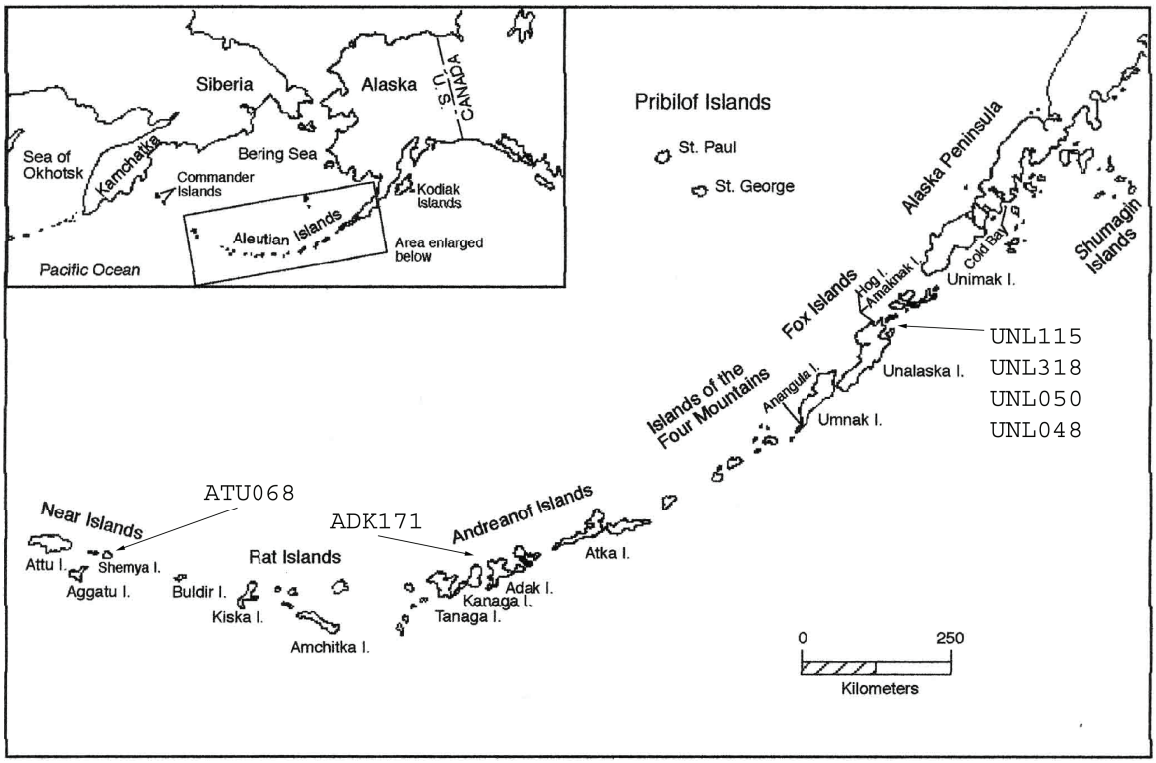

Figure 1. Map of the Aleutian Islands. Site numbers mark assemblages used in this analysis and their locations. Illustration by R. Rubicz, with modifications.

shapes of microblade cores and these comparisons traced microblade technology from Mongolia, through Asia, into Japan and Siberia, and across the Bering Sea to Alaska (Dixon 1999; Dumond and Bland 1995; Nelson 1935, 1937; Slobodin 1999).

In this analysis, historical continuity is evaluated by the presence or absence as well as the frequency of blade, microblade, and bifacial technology. Since these technologies are not ubiquitous through time in the Aleutians, their occurrence, appearance, and disappearance from sites along the chain are indicators for significant shifts in technological organization. Both tools and the debris from manufacturing these three technologies (blade, microblade, and bifacial) are analyzed. Based on these findings, it appears that the western and eastern Aleutian occupants are historically related since the sites analyzed contain blade, microblade, and bifacial technology at chronologically similar times.

Chipped Stone Technologies

This analysis relies on the identification of tools and debris characteristic of blade, microblade, and bifacial technologies as well as flake technologies. Blade technology is a specialized technology characterized by flakes twice as long as they are wide that are removed along the length of a core with platforms at one or both ends (Bordes 1961, 1967; Bordes and Crabtree 1969; Collins 1999; Crabtree 1972; Whittaker 1994). The blades can then be retouched into and/or used as tools. This method of tool production requires prepared, standardized cores (Collins 1999:9; Crabtree 1972:16). Blade technology provides an adaptable and efficient reduction system, and requires organized, preplanned techniques and a great deal of skill (Collins 1999; Inizan et al. 1999:71; Leroi-Gourhan 1943; Sheets and Muto 1972; Whittaker 1994). The use of this technology is well documented in Africa, Europe, Asia, and North America (Bar-Yosef and Kuhn 1999; Collins 1999). The documented variability in blade production techniques allows for regional blade technologies to be differentiated (Collins 1999:12). It should be noted that blades might occur by chance during other reduction methods, but such incidental blades are very rare.

Microblades are very small blades and are typically differentiated from larger blades based on a size attribute defined by the analyst (Inizan et al. 1999; Owen 1988). In this analysis, a blade less than 11 mm wide is called a microblade. This is somewhat an arbitrary decision, but is supported

by Dumond and Knecht (2001:20–21), who document two classes of blades separated by a width of 11 mm. Microblade technology, like blade technology, relies on well-organized techniques and a great deal of skill. The use of this technology is well documented in Asia and North America and the variability in microblade production techniques allow for regional microblade technologies to be differentiated (Dixon 1999; Nelson 1935, 1937).

Bifacial technology includes bifaces and bifacial thinning flakes. A biface is a kind of tool or core that is flaked on two sides (faces). Bifaces were used as tools, preforms, and cores. The debitage that is indicative of bifacial reduction, bifacial thinning flakes, reflect the later stages of bifacial manufacture and are typically flat with broad shallow flake scars on the back and have the edge of a biface on the platform (proximal end). The shapes of finished bifacial tools, usually projectile points, are commonly used to define temporal and regional variations.

Also identified in these assemblages is an abundance of items using generalized flake/core technology, as seen in formal unifacial tools (tools requiring planning and time to create), informal (expedient) flake tools (tools that do not require planning or time to create and use), flake cores, and debitage. The debitage consists of flakes, flake fragments, shatter, and blocky debris. While some or even most of this debitage is produce from general flake reduction, some is also produced during bifacial, blade, and microblade reduction, usually during early stages of reduction. Thus much of the debitage cannot be definitively associated with any one technology. For the purposes of this analysis, all of the debitage that is not a microblade, blade, or bifacial thinning flake is grouped within the category "flake technologies," but this grouping does not necessarily correlate with any one method of reduction.

This analysis focuses primarily on debitage, but incorporates finished tools when available. Collection sample sizes vary quite a bit, so this analysis should be considered preliminary. Table 1 lists the sites and components used in the analysis as well as the frequencies of artifacts per component as divided into four groups, each containing subgroups. Groups include "Blade" (unmodified, modified, and cores), "Microblade" (unmodified, modified, and cores), "Flake" (unmodified, modified, and cores), and "Bifacial" (bifaces and bifacial thinning flakes) categories.

The artifacts are also categorized by manufacturing stages and include early stage reduction activities (all cores, platform rejuvenation flakes, and debitage with cortex), late reduction and tool

Table 1. Inventory of assemblages used in this analysis, categorized by technology.

		UNL 115	UNL 318	UNL 048 L4	UNL 048 L3	UNL 048 L2	UNL 050	ADK 171	ATU 061
Blade:	**Total**	**42**	**151**	**157**	**81**	**198**	**84**	**0**	**22**
	Unmodified	19	86	78	43	60	29	0	7
	Modified	21	46	50	22	85	53	0	11
	Cores	2	19	29	16	53	2	0	4
Microblade:	**Total**	**91**	**146**	**95**	**100**	**254**	**21**	**4**	**5**
	Unmodified	80	109	80	51	139	7	2	2
	Modified	0	6	3	6	45	0	0	0
	Cores	11	31	12	43	70	14	2	3
Flake:	**Total**	**317**	**1,317**	**2,049**	**4,288**	**7,559**	**23,490**	**384**	**803**
	Unmodified	278	1,185	1,861	4,518	7,278	22,730	364	581
	Modified	9	40	129	43	114	385	6	1
	Cores	30	92	59	87	167	375	14	221
Bifacial:	**Total**	**0**	**0**	**129**	**52**	**118**	**531**	**2**	**25**
	Bifaces	0	0	122	34	54	531	2	20
Biface Thinning flakes		0	0	7	18	64	0	0	5
TOTAL		**450**	**1,614**	**2,430**	**4,521**	**8,129**	**24,126**	**390**	**855**

(UNL115 and UNL318=HOG; UNL048 L4=MbayL4, UNL048 L3=MbayL3; UNL048 L2=MbayL2; UNL050=AMKNK BR; ADK171=ADAK; ATU061=SHEMYA)

production stages (all debitage without cortex, retouch, thinning, and bifacial thinning flakes), and tools (retouched blades, microblades, edge modified and utilized flakes, and bifaces). These categories are labeled "reduction" for the early reduction stage materials, and "production" for the later reduction and the production debris, and "tools." Another category used in this analysis is "Lithic material type" and these types include basalt, andesite, chert/jasper, and obsidian. Lithic material availability and access were an important component of technological organization and the choices people made regarding the technologies they used would have been influenced by what materials were available. Chert and jasper are grouped into the "chert" category since they both reflect a similar level of abundance and quality of workability.

The Assemblages within the Aleutian Chronology

The oldest sites in the Aleutians date to between 9402–8593 cal B.P. (Davis and Knecht 2010:513). These sites define the Early Anangula phase and include the Anangula Blade site on Anangula Island, near Umnak Island, and the Russian Spruce (UNL-115) and Uknodok (formerly known as Oiled Blade, UNL-318) sites on Hog Island, near Unalaska Island (Fig. 1) (Aigner 1978; Dumond and Knecht 2001; Knecht and Davis 2001; Laughlin and Aigner 1966). These sites are characterized by blade and microblade technologies, but lack bifacial technology (Hatfield 2006, 2010; Knecht and Davis 2001). They also include debitage, much of which may belong to these formal technologies, but also reflect some reduction associated with flake technologies (formal and informal).

The chipped stone debitage and tools from the two Hog Island (UNL115, UNL318) sites indicate that the site occupants relied on 10% to 20% blade and microblade technologies, and the remaining 80% to 90% of the collection reflect flake technologies. The Hog Island collection does not include any bifacial technology. These assemblages, for future comparisons, are grouped as one assemblage (referred to as "HOG" in illustrations) representing the technology used by populations in the eastern Aleutians around 9000 B.P. When combined, the percentage of blade and microblade technologies averages around 9% and 11%, respectively. Both assemblages reflect 17 to 18% reduction debris, 75 to 78% production debris, and 6 to 7% tools (Hatfield 2006). The lithic materials at these two sites include 36% chert, 33% andesite, 24% obsidian, and 7% basalt. In the central and western Aleutians, thus far, there are no sites dating to this time period.

The following Late Anangula phase is defined by sites in the eastern Aleutians, dating between 7000 and 4000 B.P., that are characterized by a continuance of blade, microblade, and flake industries, as well as the appearance of bifacial technology and bone technology (Knecht and Davis 2001:274; Davis and Knecht 2010:514). The Margaret Bay site on Unalaska has two components (Levels 4 and 5) dating to this phase but only Level 4 artifacts were used in this analysis. The Margaret Bay, Level 4 component (referred to in illustrations as MBayL4) has several dates ranging from 5585 to 4446 cal B.P. and yielded elements of blade, microblade, and bifacial technology (Knecht et al. 2001). Chipped stone analysis of the Level 4 component of Margaret Bay reflects a small amount of blade and microblade technology (6% and 4%, respectively), as well as a small amount of bifacial technology (5%), and an abundance of flake technology (85%). The Level 4 component debris is predominantly from production (79%), with a small amount of reduction debris (8%) and few tools (13%) (Hatfield 2006). Lithic materials in this assemblage consist of 49% basalt, 38% chert, but only 8% obsidian and 5% andesite.

In the central Aleutians, ADK171 (referred to in illustrations as ADAK) is a site on Adak Island that dates between 6041 and 5734 cal B.P. (Luttrell and Corbett 2000; West et al. in press). It is located on a second terrace, 20 m asl, and overlooks a large lagoon. A very small sample (N=390) of debitage and tools was recovered from this site and the assemblage revealed no blade technology, a little microblade (N=4) and bifacial (N=2) technology, and abundant flake technology (98%). It is important to note, however, that this is a very small sample and only tenuously represents the site and the central Aleutians at this time. The lithic materials identified include 45% chert, 29% andesite, 15% obsidian, and 11% andesite.

The Margaret Bay phase, dating to between 4000 and 3000 B.P., follows the Late Anangula phase. Blade and microblade technologies continue during this time, although evidence for their use occurs less frequently than for previous eras, and expedient flake tools are common. During this phase well-flaked small bifacial and unifacial tools occur such as the small "Qaxaq" projectile point (which has been compared to the small-tool industry of the Arctic Small Tool tradition), as well as ground-stone, polished adzes, slate ulu blades and lances, and ornaments of ground jet (Knecht and Davis 2001:276). The Margaret Bay Level 3 component (referred to as MBayL3 in illustrations) is a discrete occupation dating from 4254 to 3638 cal B.P. (Knecht et al. 2001:5, 42). Chipped stone technological analysis of the Level 3 component documents the continued presence of blade and microblade technology (both at 2%) and bifacial

technology (1%), and high levels of flakes, flake tools, and flake cores (95%). There is less reduction debitage (23%) than production debitage (75%), indicating tool production was a dominant activity (Hatfield 2006). Tools, on the other hand, comprise only two percent of the sampled assemblage. The lithic material consists of 65% basalt, 22% chert, 7% obsidian, and 6% andesite.

The Margaret Bay Level 2 component (referred to in illustrations as MBayL2) also dates to the Margaret Bay phase, between 3681 and 3214 cal B.P. (Davis and Knecht 2010). This component yielded the largest sample used in this analysis. The assemblage contains few blade and microblade elements (2 to 3%), little bifacial (1%) technology, and abundant flake (94%) debris and tools. Compared to Level 3, there are similar proportions of tools but less reduction debitage (9%) and more production debris (89%), again suggesting that the main activities at the site involved late reduction and tool production (Hatfield 2006). The lithic material from this component consists of 73% basalt, 15% chert, 7% obsidian, and 6% andesite, thus being very similar to the Level 3 component.

A third Margaret Bay phase site in the eastern Aleutians is the Amaknak Bridge site (UNL050), which is located close to the Margaret Bay site. The Amaknak Bridge site, referred to as "AMKNK BR" in illustrations, dates from 3835 to 2492 cal B.P. (Davis and Knecht 2010). The assemblage has very little blade and microblade technology (less than 1%), a low frequency of bifacial technology (2%), and a high frequency (98%) of flake tools and debris. The Amaknak Bridge site has similar percentages of reduction (13%) and production debris (83%) and tools (2%) when compared with other Margaret bay phase sites. The lithic materials consist of 50% basalt, 29% chert, 21% obsidian, and no andesite.

In the central and western Aleutians, sites dating to the Margaret Bay phase have been documented on Adak, Amchitka, and Shemya (see Corbett et al. 2010; Hatfield 2010; West et al. in press). These sites contain flake and bifacial technologies as well as bone technology consistent with the Margaret Bay phase site descriptions, however blade and microblade technologies are not commonly reported. ATU061 is located on Shemya Island in the Near Island group of the Aleutian Islands (Fig. 1). The site, referred to as "SHEMYA" in illustrations, dates between 3355 and 3295 cal B.P. (Corbett and Loring 2010; Lefèvre et al. 2001). It is dominated by flake technology (94%), with small proportions of blade (3%), microblade (1%), and bifacial (2%) technologies. This site exhibits the highest proportion of reduction debris (61%) of any of the sites in this analysis, and has similar proportions of tools (5%) but less production debris (34%). The lithic material at this site consists of 55% basalt, 38% andesite, 7% chert, and no obsidian.

Technological Comparisons

Based on the frequencies of the various chipped stone technologies from these sites, distinct differences and similarities are noted in these assemblages, both through time and across the chain. Figure 2 illustrates the distribution of each technology, which is dominated by flake technology. As mentioned above, the dominance of flake technologies is likely due to the production of flakes in the manufacture of bifaces, blades, and microblades, in addition to the production of formal and informal flake tools.

Since flake technology is ubiquitous and other technologies are far less frequent, comparisons are made without flake technology so that relationships between the remaining three technologies are more apparent. Figure 3 shows both blade and microblade technologies well represented in the Early Anangula Phase assemblages (HOG), but by the end of the Margaret Bay phase (AMKNK BR), they are both rare. ATU061 (SHEMYA) reflects very similar proportions of blade technology to the Margaret Bay, Level 2 sample (MBayL2). The ADK171 (ADAK) assemblage is distinct from all of the assemblages in its lack of blade technology. This may simply reflect the small sample size, but it may also mark a significant divergence in cultural traditions. The small number of microblades and blades at SHEMYA, as well as the few microblades from ADAK, tentatively support the presence of these technologies in the central and western Aleutians.

The variation within each subcategory of blade technology is illustrated in Figure 4. Unretouched blades (BL), modified blades (BLT), and blade cores (BLC) are more common in the Early Anangula (HOG) sample, than in the samples from any other time. This suggests this technology was an important component of the toolkit used by the Aleutian island colonizers. Blade cores are never common in any assemblage, probably because expended blade cores were recycled and used for both flake removals and microblade removals, and may also have been used as tools when no longer useful as cores. Multi-technology cores (cores that served as blade and flake cores) were identified by Dumond and Knecht (2001) in the Margaret Bay site and, in general, were probably more common than cores reflecting a single technology.

Figure 5 illustrates the subcategories of microblade technology. The Early Anangula HOG assemblage dominates all subcategories of microblade technology, with the notable exception of retouched microblades (MBLT). There are more

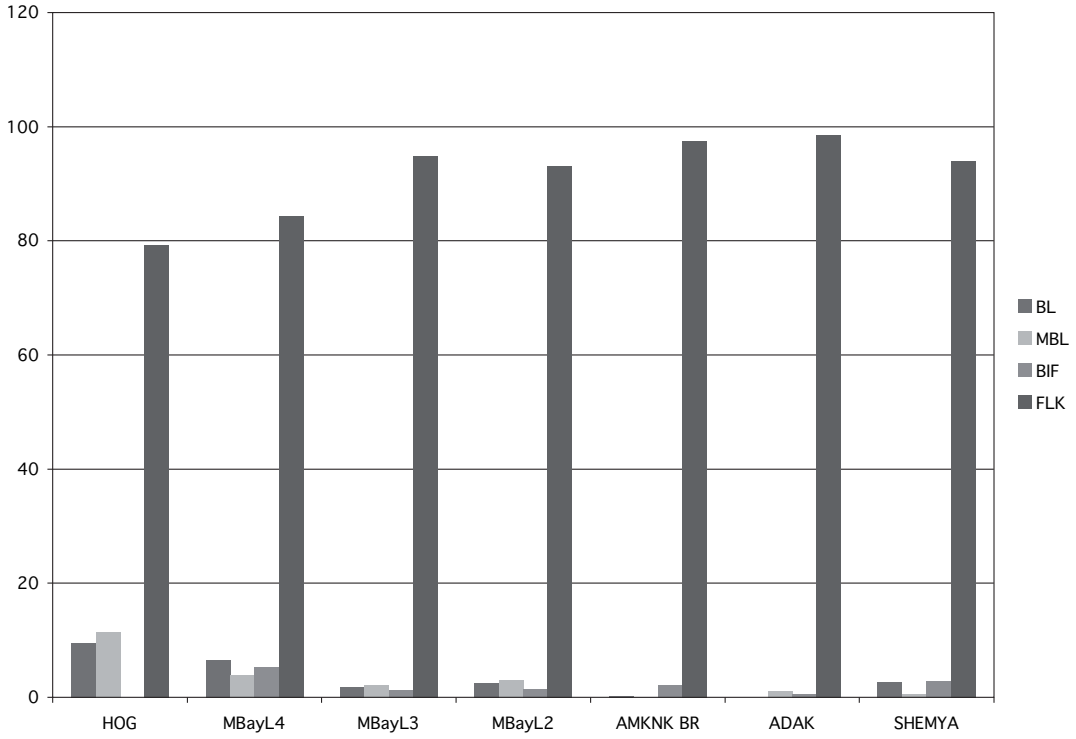

Figure 2. Chipped stone technologies identified in the assemblages mentioned in the paper. *BL*, blade technology; *MBL*, microblade technology; *BIF*, bifacial technology; *FLK*, general flake technology.

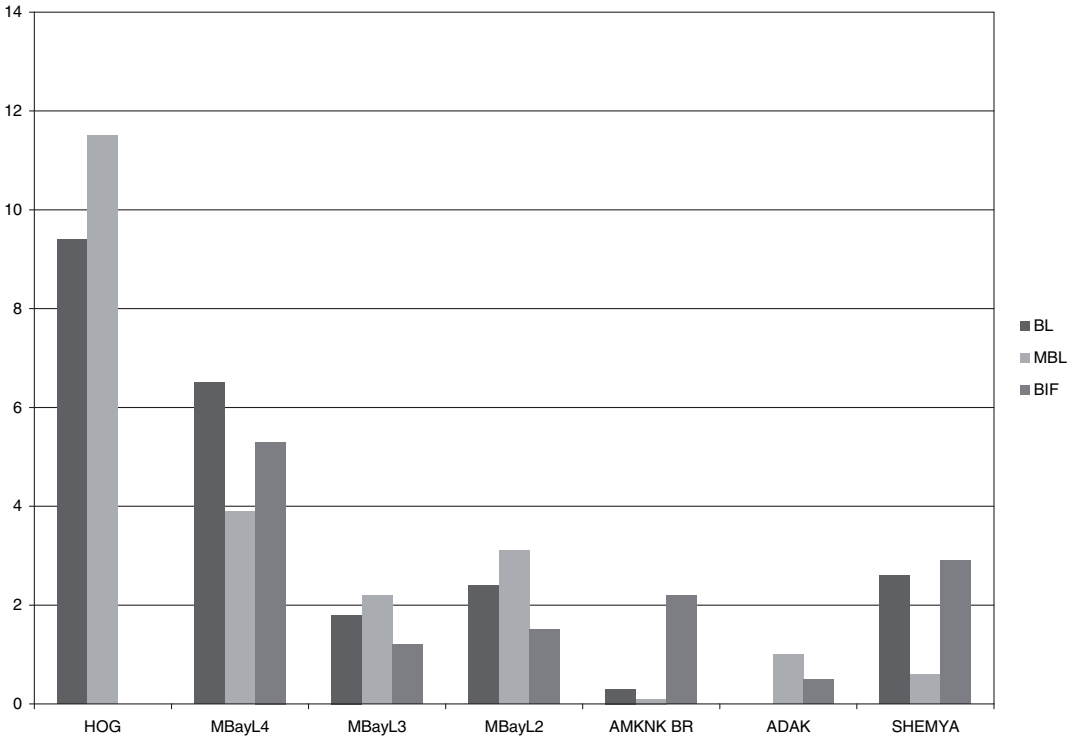

Figure 3. Chipped stone technologies identified in the sample of Aleutian sites with the flake technology removed. *BL*, blade technology; *MBL*, microblade technology; *BIF*, bifacial technology.

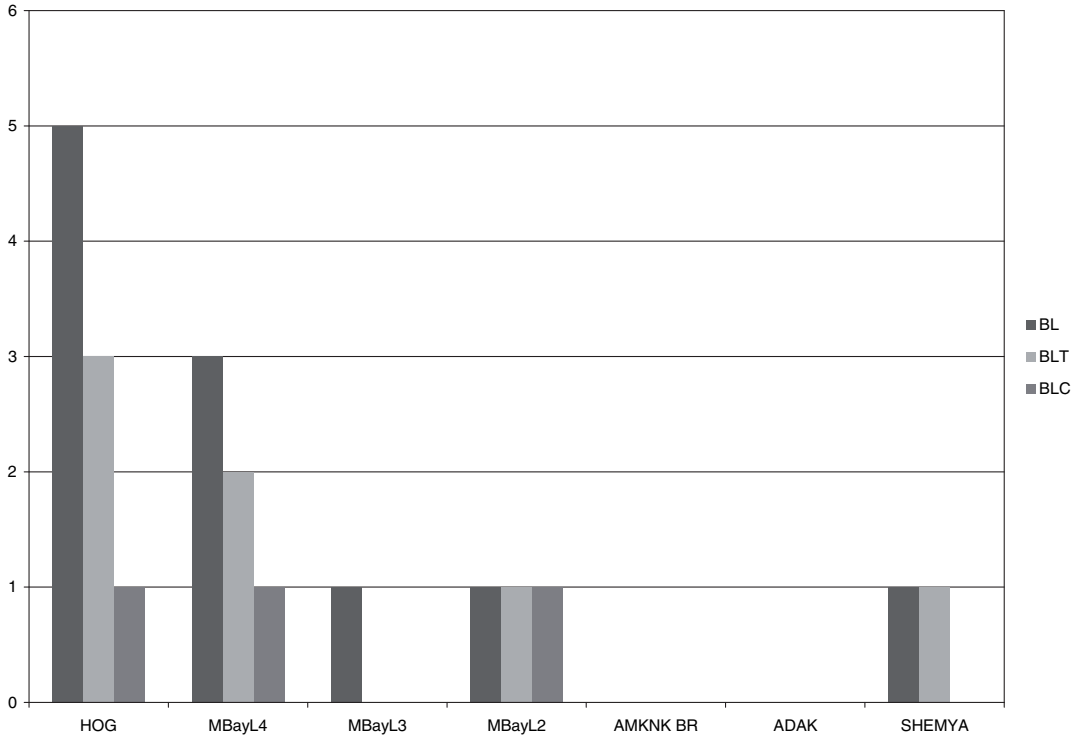

Figure 4. Blade technology divided into subcomponents within each assemblage. *BL*, unmodified blades; *BLT*, retouched blades; *BLC*, blade cores.

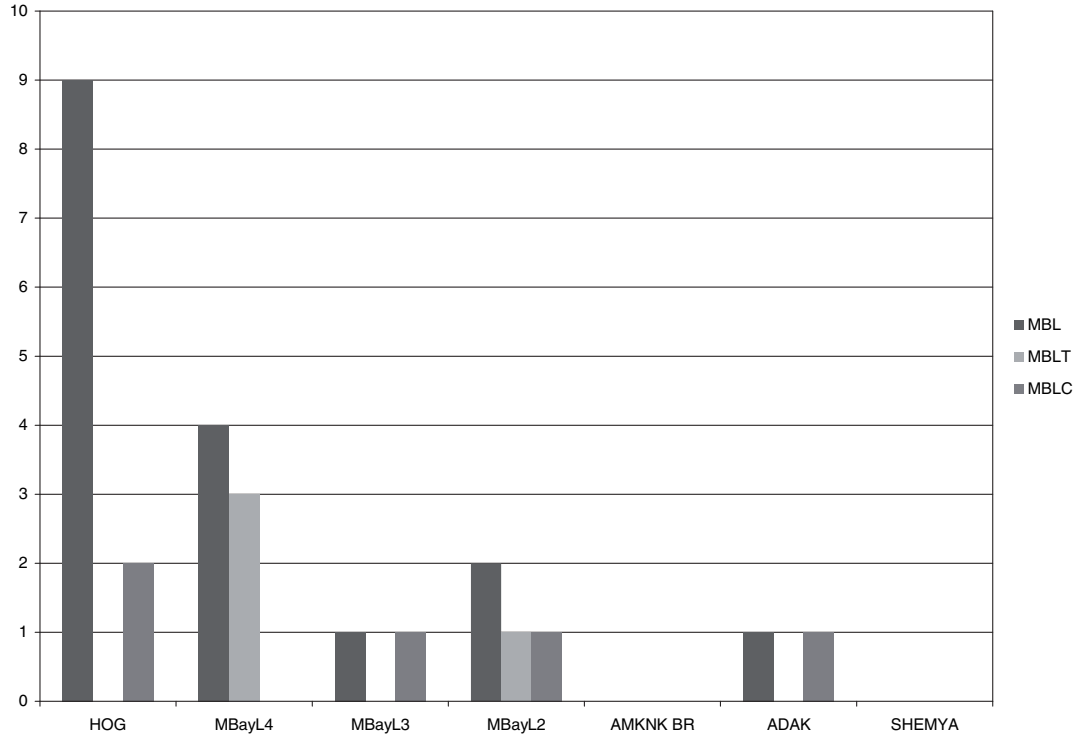

Figure 5. Graph showing percentages of subcomponents of microblade technology within each assemblage. *MBL*, unmodified microblades; MBLT, retouched microblades; *MBLC*, microblade cores.

retouched microblades in the Late Anangula phase MBayL4 component than in any other component. This Late Anangula assemblage also has several unretouched microblades (MBL), but does not have any microblade cores (MBLC), thus this site most likely was not a primary production location for microblades or else these cores were recycled. The relatively high frequency of microblade technology in these early eastern Aleutian sites suggests this technology was an important component to the early occupants of the islands.

Bifacial technology is first documented in the eastern Aleutians in the Late Anangula phase and by the time MBayL4 is occupied, this technology is well represented (Fig. 6), with half of the bifacial assemblage comprised of bifacial thinning flakes (BFT), reflecting production and retouch of bifaces at the Margaret Bay site during Late Anangula occupation. Bifacial technology is present in the Late Anangula ADAK assemblage and in the Margaret Bay phase SHEMYA assemblage. At the SHEMYA site, bifacial technology is slightly more frequent compared to the other Margaret Bay phase sites and this fact may correlate with the poor quality of lithic materials available to Shemya Island residents. No close obsidian sources were available and there were few options for other highly siliceous materials such as cherts or jaspers.

Although lower in frequency in the earliest assemblages, flake technology is ubiquitous at all sites in this analysis (Fig. 7). Flake tools (FT) include unifaces, retouched flakes, and utilized flakes and are more frequent in the Late Anangula MBayL4 assemblage than in the other assemblages. Flake cores are most abundant in the Margaret Bay phase SHEMYA assemblage. The high frequency of flake cores at SHEMYA is also associated with the poor quality of lithic materials available. Occupants may have opted to produce expedient flake tools with infrequent investment in further reduction of the flake cores or flake tools, thereby creating a large number of tested cobbles and flake cores.

The dominance of flake technologies in Margaret Bay phase sites in general probably reflects a decrease in mobility as more people occupied and controlled the locations of better quality lithic materials. Depending on their location, some groups would have had to rely more on local and less ideal lithic materials. Relying on these local materials would have made informal tools more at-

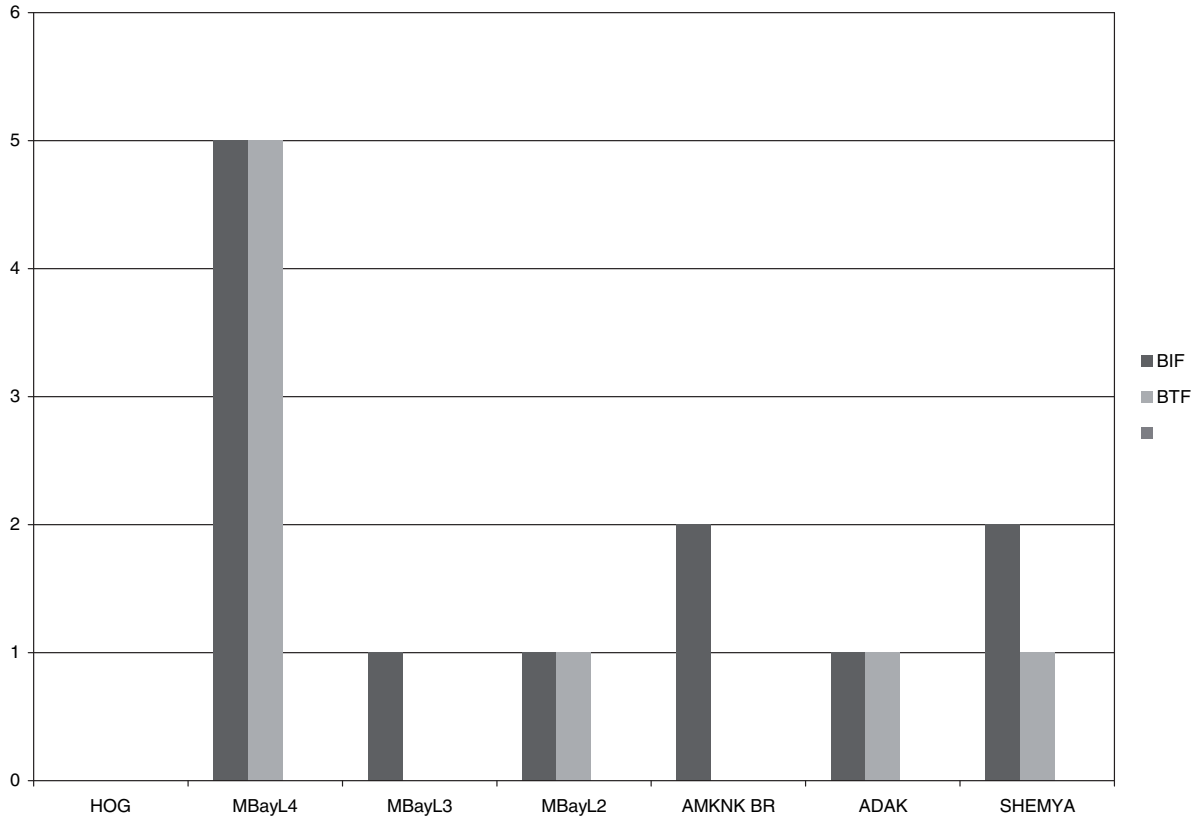

Figure 6. Graph showing percentages of subcomponents of bifacial technology within each assemblage. *BIF*, complete bifaces and fragments of bifaces and *BTF*, bifacial thinning flakes.

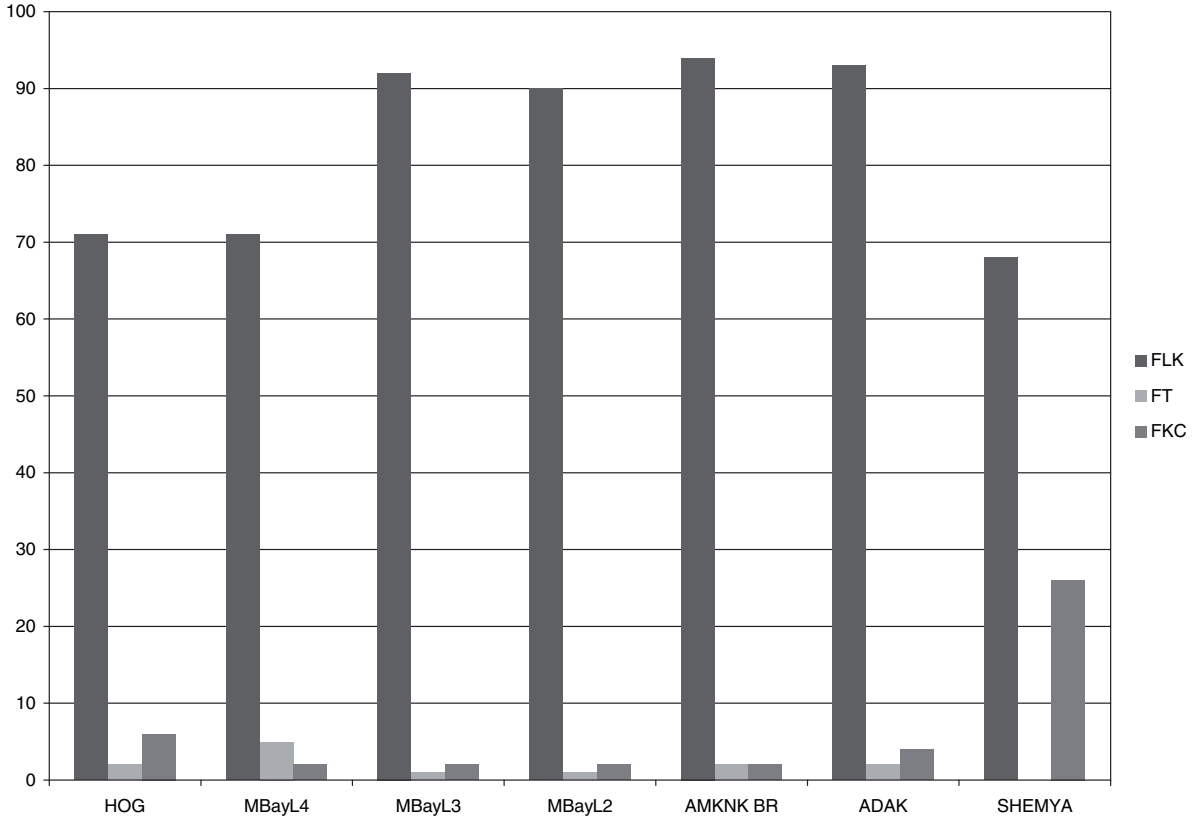

Figure 7. Graph showing percentages of subcomponents of flake technology within each assemblage. *FLK*, unmodified flakes; *FT*, modified flakes; *FKC*, flake cores.

tractive. Additionally, an increasing reliance on bone, slate stone, and/or ground stone industries may have supplanted the need for formal chipped stone tools (like bifaces, blade and microblade tools). For instance, bone harpoons and bone fishhooks were used instead of chipped stone harpoon or spear points for hunting and fishing. Flake technology continued to serve for general cutting and scraping activities.

Lithic material availability and access was an important component of technological organization. Based on these assemblages, it is noted that across the Aleutians, chert and obsidian are far less common than basalt and andesite (Fig. 8). Geologically, basalt and andesite are more abundant, occurring in exposed locations along the island cliffs and shorelines of most, if not all, Aleutian Islands. In this analysis, it seems clear that, of the two, basalts were preferable by far, since it is only in the western Aleutians and in the Early Anangula HOG assemblages that we see andesite occurring in amounts greater than 6%. In the western Aleutians, this fact may correlate with a lower availability of basalts limiting their choices. The HOG assemblages indicate that the people occupying the Hog Island sites dating to 9000 cal B.P. were less familiar with the resources compared to later populations in the same area (at the Margaret Bay, Levels 2–4 and at Amaknak Bridge) who used very little andesite.

Figure 9 shows basalt and andesite grouped together (since they are more accessible, but of lower quality than chert and obsidian) and chert and obsidian grouped together (since they are less accessible, but of higher quality and thus more desirable). The ADAK and AMKNK BR assemblages show more chert and obsidian compared to later sites. The SHEMYA assemblage has no obsidian, but does have some chert and a lot of andesite and basalt. Through time, obsidian and chert decrease, indicating that access to these materials must have been increasingly limited. This may have been due to a population increase, which is reflected by the appearance of larger villages on more and more islands during and following the Margaret Bay phase. The increasing regionalization of the area would have made access to limited lithic material more difficult.

The AMKNK BR assemblage has equal proportions of the obsidian/chert group and basalt/andesite group, which suggest they had access to chert and obsidian, either directly or through

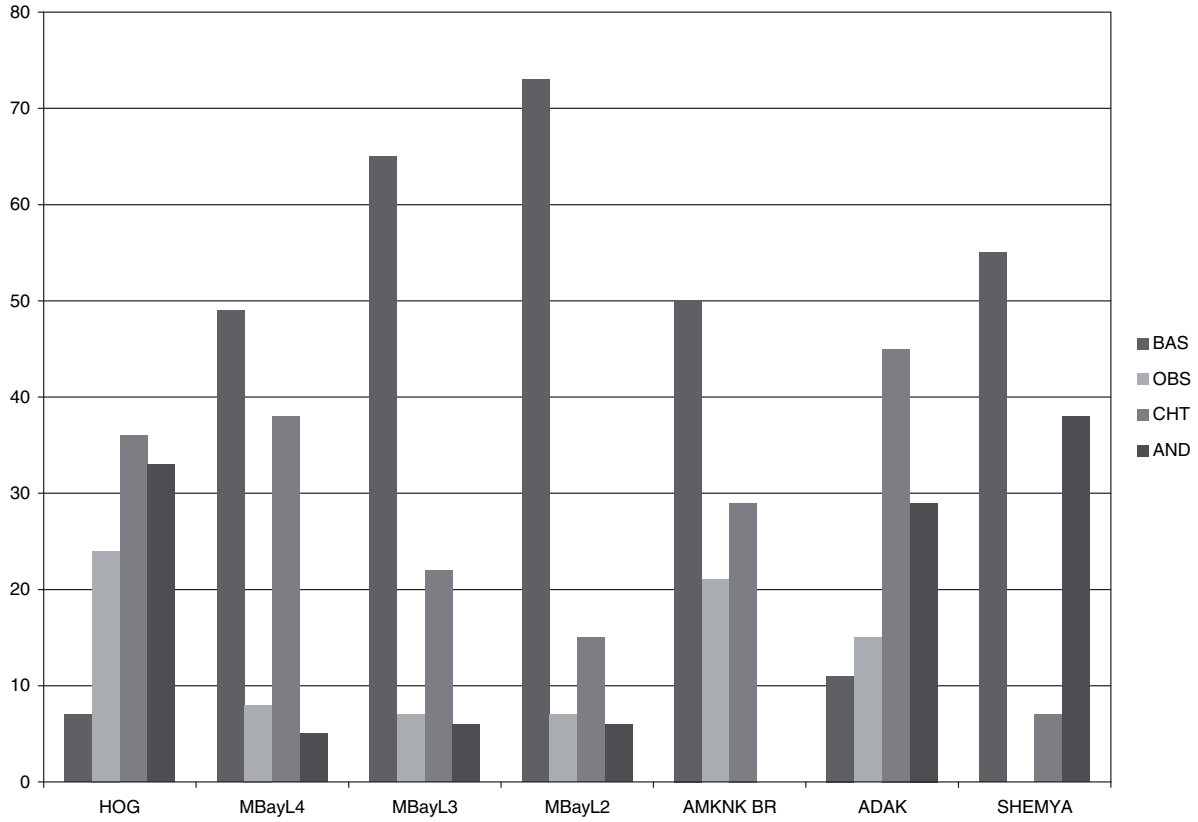

Figure 8. Graph showing percentages of lithic materials by assemblage. *BAS*, basalt; *OBS*, obsidian; *CHT*, chert; *AND*, andesite.

trade. This is interesting since the site is located near the Margaret Bay site and occupied at the end of the Margaret Bay phase (just after the MBayL2), but reflects differential access to lithic materials (see Table 2). The MBayL3 and MBayL2 both show extensive use of the basalt/andesite group and Fig. 8 indicates this high frequency utilizes predominantly basalt. This suggests that the Margaret Bay occupants relied on a relatively fine-grained basalt source that was useful for the majority of their tool manufacture, whereas the Amaknak Bridge site occupants used comparatively more chert and obsidian.

The patterns in lithic material use for each kind of technology are interesting, but predictable, as blade and microblade technology relied primarily on chert and basalt (Hatfield 2006; Knecht and Davis 2001). Obsidian is less common in bifacial technology due to the fragile nature of this glass-like material with less durable edges than basalts, chert, or almost any other material. Chert dominates both blade and microblade technology. Obsidian is more common in blade technology than in microblade, bifacial, and flake technology. Both bifacial and flake technology are dominated by basalt, with chert well represented. The lithic materials represented in bifacial technology suggest that bifacial technology required materials that are durable and at least of moderate siliceous quality. Bifacial technology is the only technology that does not reflect changes in lithic material use through time. Though bifaces were made from obsidian or andesite, the preferred materials were basalt and chert.

Conclusions: Historical Continuity vs. Discontinuity in the Aleutians

The distribution of the different kinds of technologies through time and across the island chain provides some insight regarding historical continuity or discontinuity. With respect to bifacial technology, a recent discovery at the Amaknak Quarry site, which dates to 8040–6740 cal B.P., indicates bifacial technology arrived in the eastern Aleutians possibly as early as 8000 cal B.P. The earliest assemblage with bifacial technology in the eastern Aleutians in this analysis is the MBayL4 assemblage. The appearance of bifacial technology in the Aleutians may reflect an in situ innovation and the high frequency of this technology in the MBayL4

assemblage may indicate that bifacial technology was well suited to a maritime subsistence pattern and to the available lithic materials.

The appearance of bifacial technology and its abundance in the MBayL4 assemblage may also reflect an influx of new people with different technologies, potentially replacing the previous occupants. However, since blade and microblade technology continue, indicating continuity with the Early Anangula phase occupations, human population replacement seems an improbable reason for the technology shift. Most likely, it was an idea from outside the cultural region that diffused (with or without new people) into the islands (Bland 1996). The presence of bifacial technology in the western Aleutians indicates either that these islands were colonized around 6000 cal B.P. by peoples with this technology or that the idea diffused across the chain by 6000 cal B.P., reflecting continued inter-island contact. Since so few sites dating to 6000 B.P. in the central Aleutians exist, both hypotheses are equally probable.

The decrease through time in the manufacture and use of blade technology indicates there was a shift in the importance of this technology within the toolkit of the Aleutian islanders. Perhaps the appearance of bifacial technology and/or changes in subsistence decreased the usefulness of blade technology. The differences in blade technology between the later Margaret Bay site occupations and Amaknak Bridge site are notable since these sites are very close to each other spatially and the occupation ages fall within a few hundred years of each other, with the Margaret Bay Level 2 occupation occurring as much as 500 years (maybe more) or as little as 200 years earlier. The Margaret Bay Level 2 assemblage retains some evidence of blade technology, but blade technology is not seen in the Amaknak Bridge assemblage. This may add further confirmation to findings by the excavators of these sites, as Knecht and Davis (2008:71) noted a significant difference in tool types, with few to no tools consistent with the Arctic Small Tool tradition (which do occur in the Margaret Bay Level 2 component) found in the Amaknak Bridge assemblage. Combined with the differences in lithic material use, this suggests Amaknak Bridge site occupants were not closely related to the Margaret Bay (MBayL2) site occupants. This variation may reflect a new influx of peoples or ideas into the islands or simply variability in related peoples separated by hundreds of years.

Based on the comparisons of technologies used in these Aleutian sites, the western, central, and eastern Aleutian occupants are historically related. Several of the sites have blade and microblade technology at chronologically similar times. The mere presence of microblade and blade, as well as bifacial technology, associates the central and western Aleutian populations with occupants in the eastern Aleutians. The differences in the frequency of each technology as they appear or do not appear in the assemblages may be due to the small sample sizes, excavation techniques, or due to the differences in types of manufacture and activities conducted at each location. But the presence of blade, microblade, and bifacial technologies on Adak and Shemya Island suggest some sort of ancestral relationship or social/economic connection among occupants in the eastern Aleutians.

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