Journal of California and Great Basin Anthropology | Vol. 33, No. 2 (2013) | pp. 185–195

A Typology of Channel Islands Barbed Points

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The Channel Islands Barbed point type occurs on the three larger northern Channel Islands off the coast of southern California. The points are small, unusually thin, and carefully knapped, and occur in archaeological assemblages dating between 12,100 and 7,800 cal B.P. Based on points of this type in museum collections compiled during the late nineteenth and early twentieth century and a lesser number from recent investigations, we present a typology of Channel Islands Barbed points consisting of seven subtypes, with the objective of facilitating investigation into their spatio-temporal patterning. The delicate character of the points implies that the spears or darts on which they were hafted were used to acquire fauna in aquatic environments or were thrust rather than thrown, given that they would be highly vulnerable to breakage if thrown on land. Although having a very limited geographic distribution, the Channel Islands Barbed point type is comparable in quality of knapping to other Paleoindian and early Archaic types found elsewhere in North America.

Channel Islands Barbed (CIB) points are a distinctive type of biface occurring on the three larger northern Channel Islands, San Miguel, Santa Rosa, and Santa Cruz (Fig. 1). Compared to other point types occurring on the islands and the adjacent mainland, most CIB points are relatively small and unusually thin, and they exhibit a high degree of pressure-flaking workmanship. Justice (2002:263–264) first formally described and named CIB points, based on published descriptions or illustrations (Heye 1921; Jones 1956; Wardle 1913) and examples in collections housed at the American Museum of Natural History. CIB points have also been called Arena points (Erlandson and Braje 2007; Rick 2008) on the basis of their discovery in a dated context at the Punta Arena site (CA-SCRI-109) on Santa Cruz Island. As the type name implies, CIB points generally have prominent barbs. All are stemmed, and blade angles at their tips are very acute.

The antiquity of CIB points has only recently been recognized. At the time of Justice's research, no chronological information was available, given that the contextual information associated with the museum collections consisted only of island of origin. Justice (2002:264) proposed that the type probably dated sometime between 3,000 and 1,000 B.P., largely because it appeared to be a more refined version of larger stemmed point types dating as early as 4,500 B.P. The first definitive indication of the type's antiquity came from a 1997 investigation at the Punta Arena site, where three specimens were excavated from deposits dating between 8,500 and 7,800 cal B.P. (Glassow et al. 2008:50). This discovery led to the recognition of another example found by Rozaire deep in the stratified deposits at Daisy Cave (see Erlandson and Jew 2009). Erlandson and Braje (2007) also surface-collected five CIB point fragments from CA-SMI-575 on western San Miguel Island, associated with shell midden deposits dated between ~8,600 and 8,270 cal BP, and Braje (2010; see also Erlandson et al. 2005) found a single CIB point on the surface of CA-SMI-608, a 9,500 cal B.P. shell midden

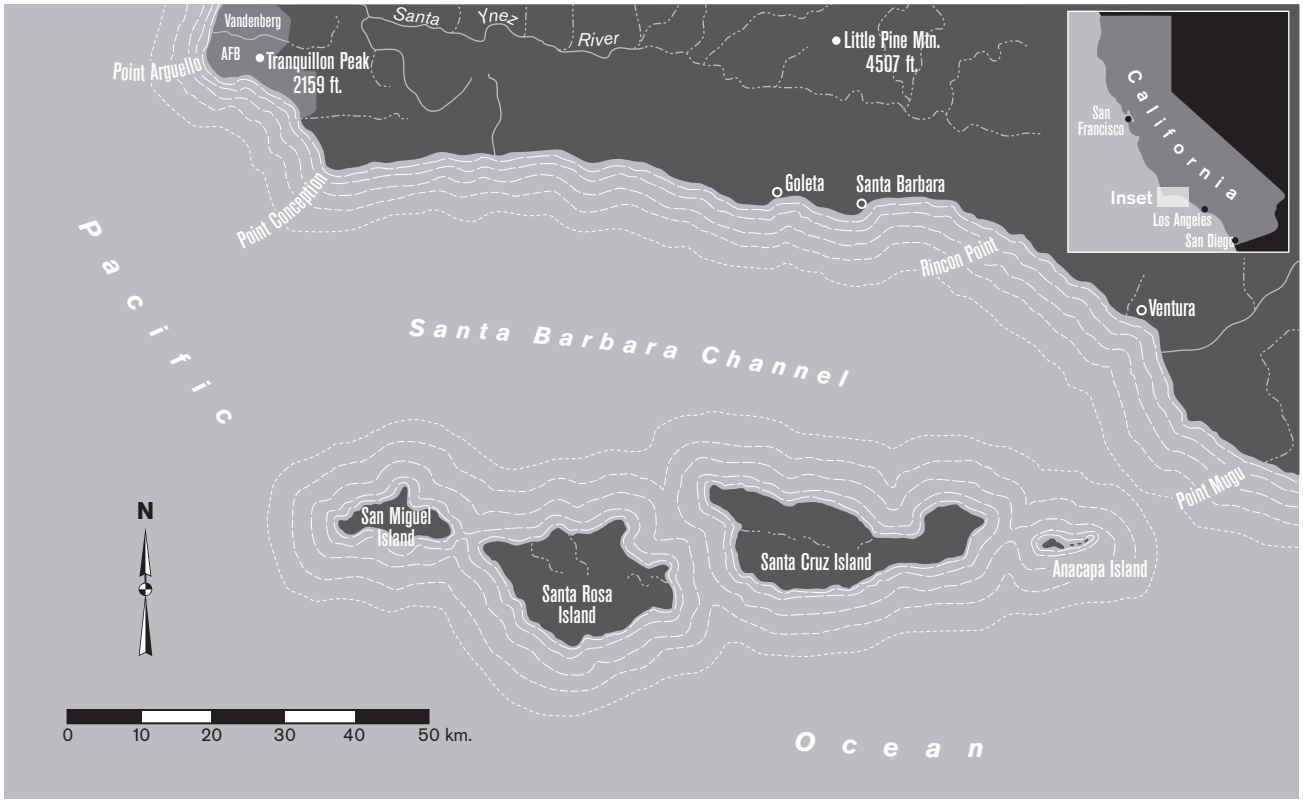

Figure 1. The Santa Barbara Channel region showing the locations of the northern Channel Islands.

and lithic scatter, also on San Miguel. More recently, CIB points have been found at CA-SRI-512W on Santa Rosa Island and at CA-SMI-678 and -679 on San Miguel Island in deposits dating between ~12,100 and 11,340 cal B.P. (Erlandson et al. 2011). Currently available information, therefore, suggests that CIB points were used for at least 3,500–4,300 years.

CIB points vary significantly in shape, even though all exhibit attributes that Justice used to define the type. Our objective here is to develop an initial typology to characterize the considerable morphological variability among CIB points. In addition, this initial typology can serve as a guide to exploring the time-space context of the variability as more CIB points are documented within dated contexts at Channel Islands sites.

METHODS

The typology presented here is intuitive in that it is the "result of direct apprehension" (Spaulding 1982:11). Many initial typologies of artifacts are conceived in this manner (Adams and Adams 1991:19). They are first approximations that are subject to change as more artifacts meeting the criteria for being included in the typology come to light. Eventually, more CIB points will be added to the current database through archaeological investigation and searches of museum collections, and when the number of CIB points becomes substantially greater, our typology should be revisited.

The typology is based on 84 CIB points. Some 66 of this total are in the collections of the American Museum of Natural History (AMNH), the National Museum of the American Indian (NMAI), the Phoebe Hearst Museum of Anthropology at the University of California, Berkeley (PHMA), and the Musée du Quai Branly in Paris (MQB) (Table 1). The remaining 18 are from surface collections and excavations on San Miguel and Santa Cruz Islands since 1997. Excluded are some points recently obtained from a site on Santa Rosa Island (Erlandson et al. 2011). The majority of CIB points that are sufficiently complete for their overall shape attributes to be discerned are in museum collections; those meeting this criterion collected within the last 15 years are few. Indeed, several of those recently collected at San Miguel

Table 1

MUSEUM LOCATION, COLLECTING CONTEXT, AND NUMBERS OF CIB POINTS COMPLETE ENOUGH FOR TYPE ASSIGNMENT (66 TOTAL)

Museum	Collector	Project	Year	No. of CIB Points	Published References
National Museum of the American Indian	Ralph Glidden	Mrs. Thea Heye Expedition	1919	7	Heye 1921
American Museum of Natural History	James Terry	Personal acquisition (purchased?)	pre-1891	27	Justice 2002
Musée du Quai Branly	Leon de Cessac	French scientific expedition	1877–1879	22	Reichlen & Heizer 1964
Phoebe Hearst Museum of Anthropology	Philip Mills Jones	Investigation on Santa Rosa Island	1901	10	Heizer & Elsasser 1956

Island quarry/workshop sites (e.g., CA-SMI-678 and -679) appear to be either incompletely manufactured or production rejects. Consequently, the substantial number in museum collections are necessary for developing a typology. Museums visited were the AMNH, the NMAI, and the PHMA. We were also fortunate in obtaining photographs of CIB points in the collections of the MQB.

Because CIB points are distinctive when compared to other point types in archaeological collections from the Santa Barbara Channel region, or from elsewhere in California, they are generally easy to distinguish in museum collections, despite the lack of provenience information other than island of origin. Nonetheless, some points tend to be larger and thicker than typical, and to exhibit less refinement in manufacturing. Such points ultimately were assigned to a distinct subtype, as similar examples are also in collections from recent research on San Miguel and Santa Cruz islands.

All of the points in examined museum collections, aside from those at the PHMA, undoubtedly were collected on San Miguel Island. Many of the points exhibit polish on one or both faces resulting from blowing sand, implying that they were exposed on the ground surface for an indefinite period of time and undoubtedly were surface-collected. Livestock grazing from the latter half of the nineteenth century until 1966, when sheep grazing ended (Roberts 1991:113), has resulted in an extensive destruction of vegetation (Johnson 1972:272–286) and a resultant deflation of site deposits and movements of dune sand. Areas with little or no vegetation remain today, and some of the CIB points collected on San Miguel Island in recent years are from site surfaces within these areas (Erlandson and Braje 2007; Erlandson et al. 2011). Denuding of vegetation and wind deflation of site deposits was less intense on the Channel Islands east of San Miguel, which may partly account for the fewer CIB points in museum collections from these islands.

Data acquired from CIB points at the AMNH and the NMAI included catalog number; suspected stone material type; color and color variation; presence of cortex on face(s); length, width, and thickness; maximum stem width; evidence of reworking or rejuvenation; presence of serration along blade edges; and evidence of wind polish. In addition, each point was photographed (normally both faces) with a scale, although only photographs are available for the points at the PHMA and the MQB. Documentation associated with the collections at the AMNH and the NMAI also were checked in an effort to locate more specific information on provenience, but to no avail.

In order to develop the typology, photographs of each point were aggregated into one composite Photoshop image in such a way that each point image could be moved independently of the others. This allowed a sorting of the points to explore potential groupings. The result was an identification of attribute categories that we deemed most important in accounting for shape variation: overall length, stem length, and barb orientation and prominence. Seven subtypes were defined. One of these, however, includes points that appear to have been modified (reworked), and another includes points that were either still in production, a product of stone material with flaws, or a product of knapping inexperience.

RESULTS

As mentioned above, CIB points are distinguished from other point types occurring in the region on the basis of their small size, thinness, prominent barbs, stemmed bases, very acute blade tips, and generally high degree

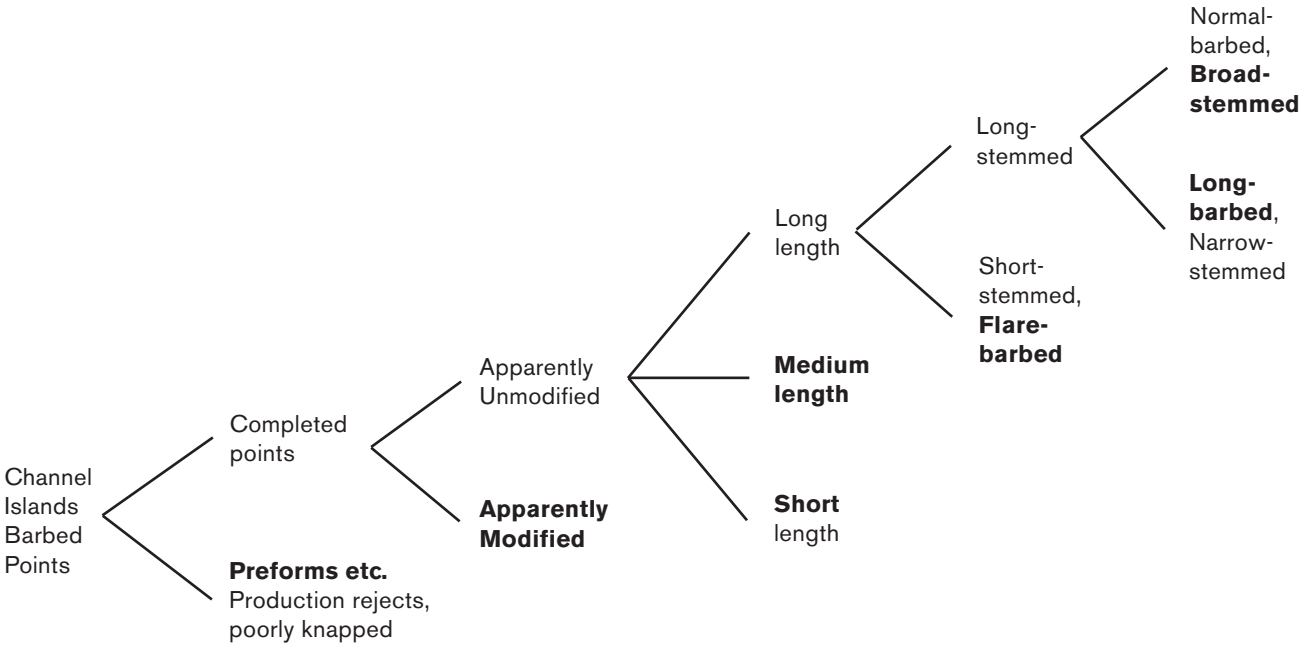

Figure 2. The typology of Channel Islands Barbed points. Subtype names are in bold.

of flaking workmanship. Among the complete points in the AMNH and NMAI collections, lengths vary between 23.4 and 61.8 mm., with an outlier that is 78.3 mm. long. Width varies between 19.9 and 39.9 mm., and thickness varies between 2.6 and 5.0 mm. Expectably, length and thickness are correlated, although weakly, with a correlation coefficient of 0.53, based on 25 points with complete lengths. Five points exhibit fine serration (9–11 serrations per cm.) along their blade edges. The actual number of serrated points may be larger, however, as the photos of the points at the MQB are not of high enough resolution to discern such fine serrations.

Our typology uses a hierarchical, or taxonomic, structure (Adams and Adams 1991:202) to explicate the relationships among the subtypes (Fig. 2). This structure shows the relative importance of the variables considered in defining the subtypes. The typology is based on five variables: completeness of manufacture, post-manufacture modification, overall length, stem length, and barb prominence. Blade widths relative to blade length and stem breadth were of secondary importance. The two highest levels of the hierarchy, completeness of manufacture and post-manufacture modification, separate out those points that might be considered "aberrant" in typologies that focus on the majority of points that characterize a type or class. Two subtypes are defined at these two highest levels. The Preforms etc. subtype consists of points with significant shape asymmetry and coarser and more irregular flake removals. The Modified subtype includes points that are anomalously short, implying that the blade was rejuvenated after breakage. In assigning names to these and the other subtypes, we have opted for descriptive terms because of the small number of points assigned to some of the subtypes and the likelihood that the typology will be modified as additional CIB points are discovered. Descriptions of the subtypes follow.

Short

Six points are assigned to the Short subtype (Fig. 3). This subtype is distinctive because of its short length, which ranges between 27 and 33 mm. Blades are uniformly concave, and stems are short and uniformly tapered. Barb angles range between 50° and 70°. This is the only subtype represented among the four CIB points from the Punta Arena site, aside from one in the Preforms etc. subtype that is similar in size (Glassow et al. 2008:47–50; Gusick 2012:240–241). If the name "Arena," introduced by Erlandson and Braje (2007) is to be retained, it could refer specifically to this subtype.

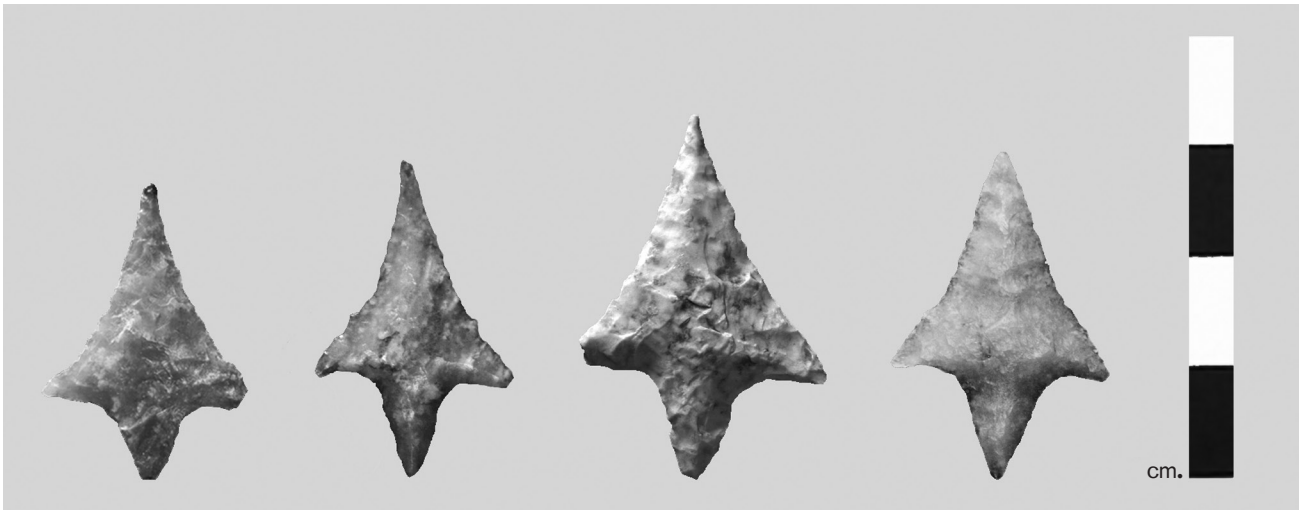

Figure 3. Examples of points within the Short subtype.

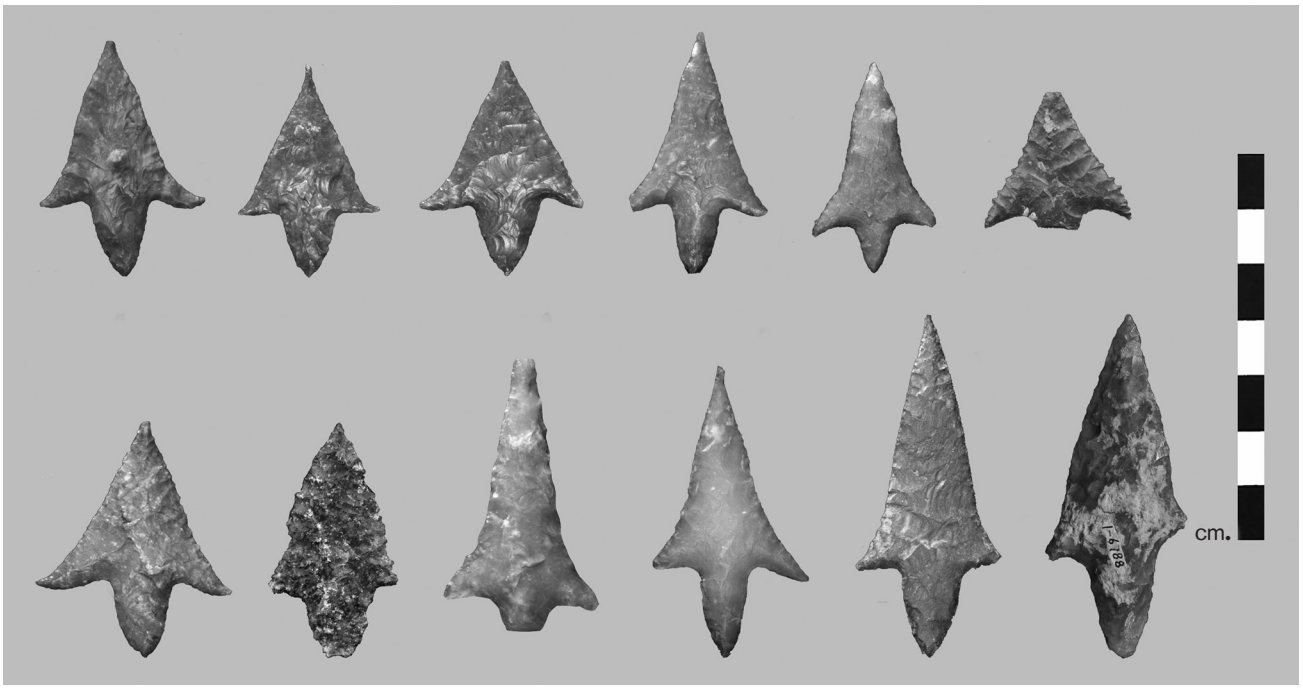

Figure 4. Examples of points within the Medium subtype.

Medium

This subtype (Fig. 4) contains by far the largest number of points: 29. Lengths range between 38 and 62 mm. Lengths of eight of the points cluster at the higher end of this range, with lengths ranging between 53 and 62 mm., whereas the remainder range between 38 and 52 mm. Barb angles range between 50° and 70°. This subtype is the most heterogeneous in shape. Some resemble larger versions of the Short subtype, whereas others have more complex shapes. Some blade edges are nearly straight, whereas others have a more complex blade shape, being concave near the barb tips and convex toward the tip, but concave again near the tip to produce the very acute tip angle common to all CIB points. Stems generally are tapered, but those with the longest stems are also broader with convex margins. Most likely, this subtype will be divided into two or more once the database becomes larger.

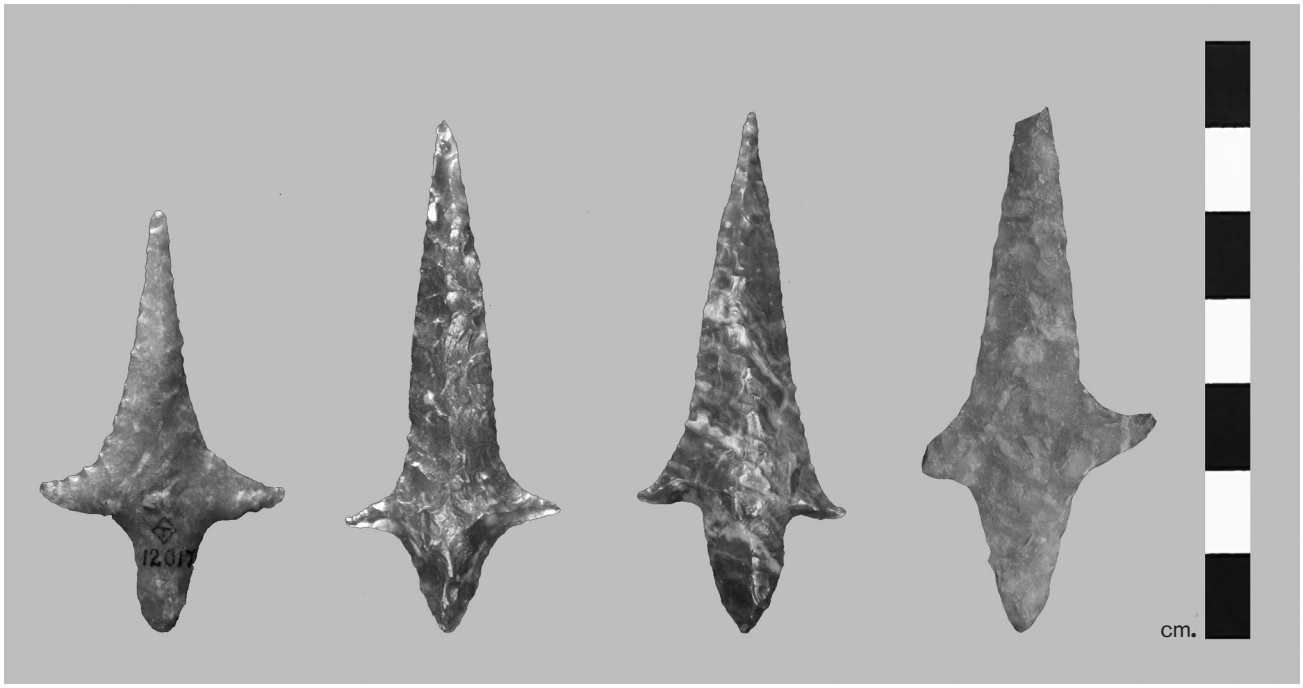

Figure 5. Examples of points within the Flare-barbed subtype.

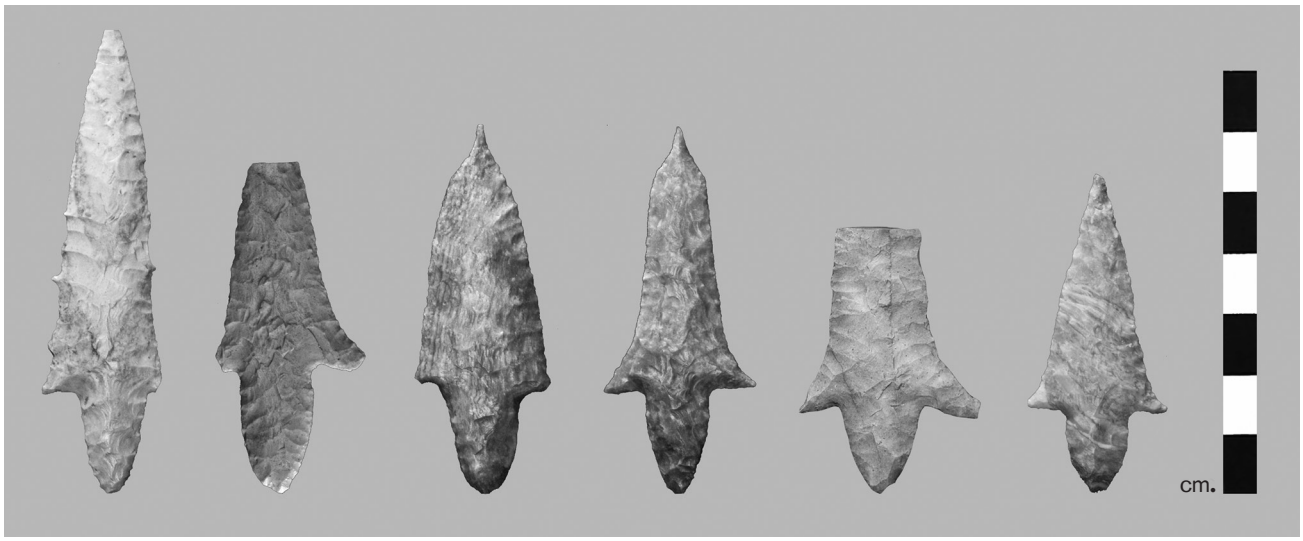

Figure 6. Examples of points within the Broad-stemmed subtype.

Flare-Barbed

The six points in this subtype (Fig. 5) have prominent barbs with broad angles, ranging between 60° and 100°, the higher end of the range giving the impression that the barbs are pointing up rather than down. The broad angles basically are a result of the points' narrow blades. These points also have relatively long lengths, which range between 50 and 61 mm. Stems are broad, all but one having convex margins.

Broad-Stemmed

Eleven points are in this subtype (Fig. 6). As the subtype name implies, stems are broad and also long. As well, barbs are less prominent than on other subtypes. Lengths range between 53 and 80 mm., thus including the longest points among the subtypes. Blade contour is variable, although most exhibit concavity near the barb tips. Barb angles range between 50° and 70°, with an outlier at 90°.

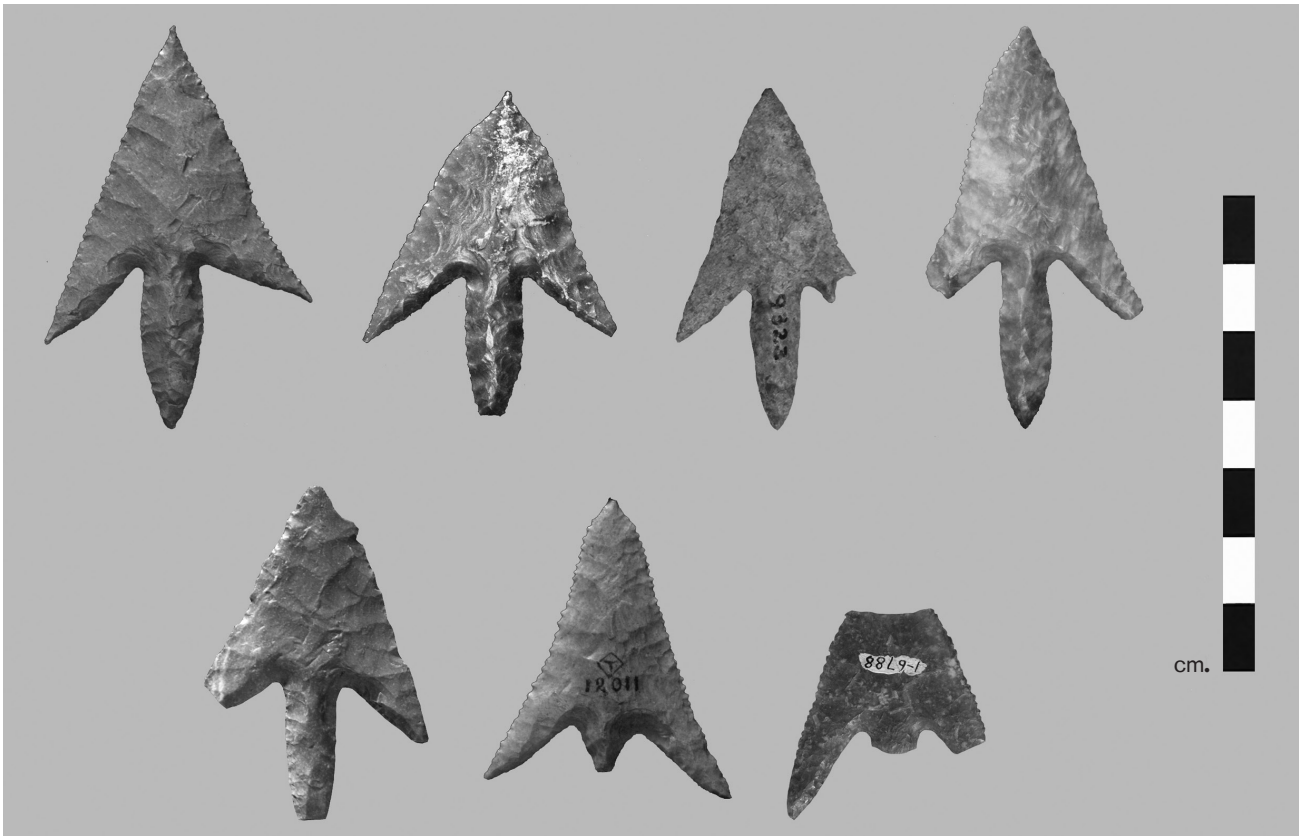

Figure 7. Examples of points within the Long-barbed subtype.

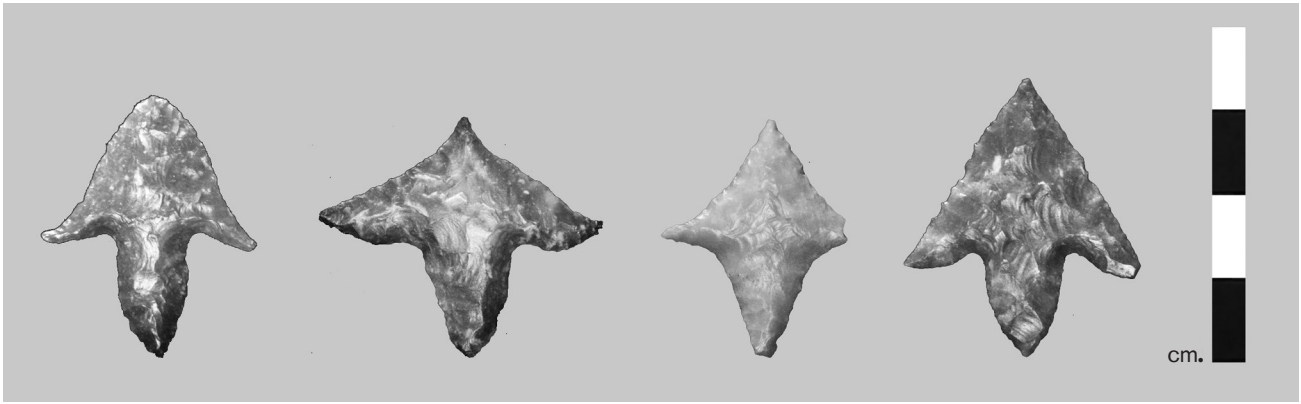

Figure 8. Examples of points within the Modified subtype.

Long-Barbed

As with the Short subtype, this subtype is quite distinctive, in this case because of long, prominent barbs (Fig. 7). All but one also have unusually long stems. This subtype contains eight points. Lengths range between 44 and 59 mm., and barb angles are between 40° and 50°. Blade edges are close to straight. Because of the long barbs and stems, points in this subtype appear to be most fragile.

Apparently Modified

The ten points in this subtype have unusually short blades given their breadths and stem lengths (Fig. 8). They range between 29 and 34 mm. in length, close to the range of points in the Short subtype. Presumably these points are a result of rejuvenation after a major portion of the blade broke off. All could be modifications of points classifiable as subtypes other than the Short and

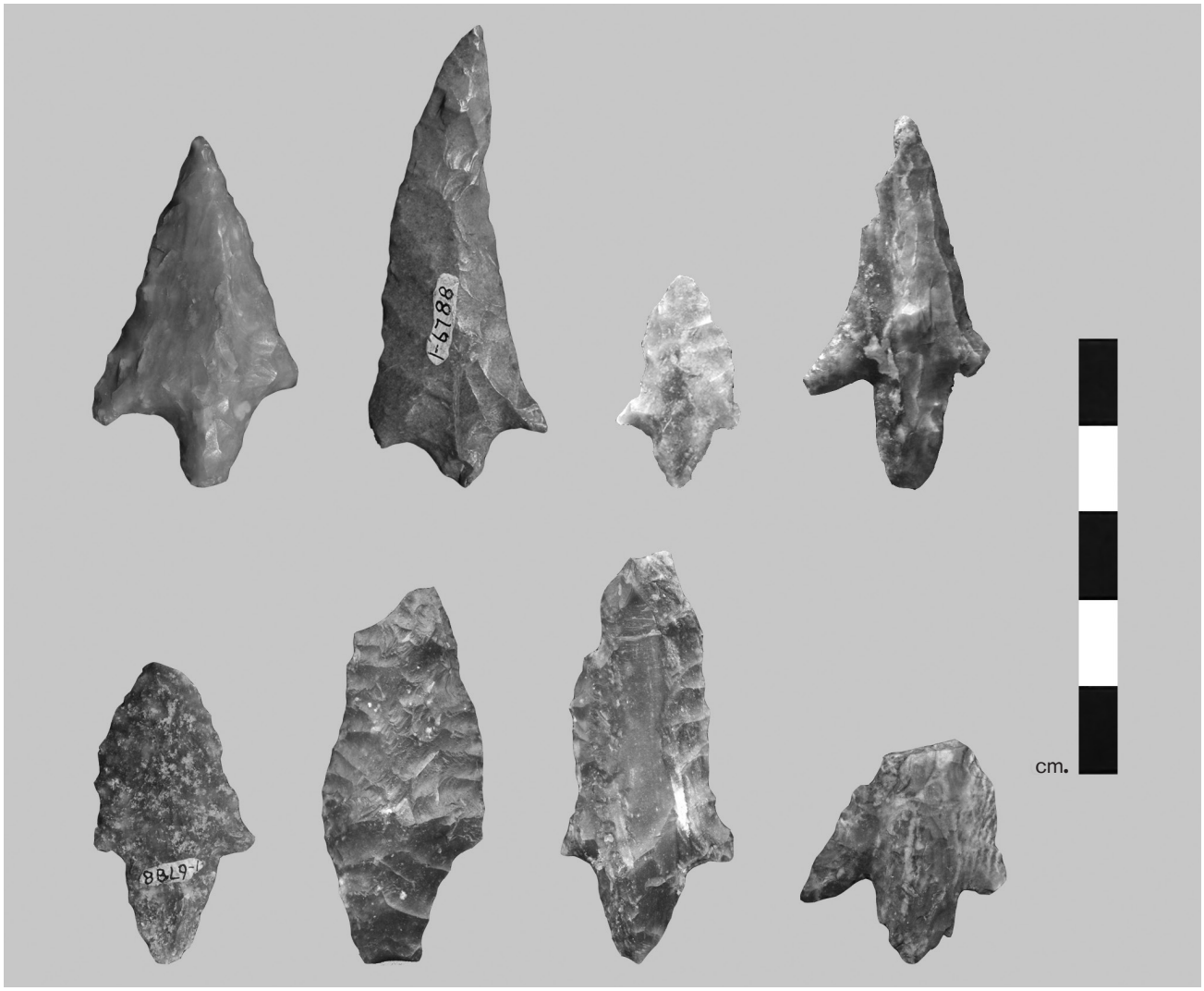

Figure 9. Examples of points within the Preforms, etc. subtype.

Long-barbed subtypes (unless barbs also were modified in the case of the latter).

Preforms and Irregularly Flaked

Because of their irregular shape and coarser flaking, the 14 points assigned to this subtype (Fig. 9) likely are either unfinished points (performs), production failures, or the product of sloppy knapping or low-quality material. A prominent "knob" on the face of one of these points implies difficulty encountered during thinning. The lengths of seemingly complete examples range between 25 and 43 mm., suggesting that a point in the Short or Medium subtype was the manufacturing objective. However, many fragmentary examples not included in the typology imply that larger points could have been the end result.

Erlandson (2013) and his colleagues (Erlandson et al. 2011:1183–1184) describe and illustrate a new point type that co-occurs with CIB points at some sites on San Miguel and Santa Rosa islands. Called Amol points or Channel Island Amol (CIA) points (Erlandson 2013), these are similar in size to CIB points, but lack barbs. Most exhibit no distinct division between blade and stem, although two have distinct stems, and both have serrated blade edges as well, the serrations being larger and more widely spaced than the serrations that occur on some CIB points. Erlandson (2013) has also identified several possible CIA points in museum collections, but their number is much smaller than CIB points.

The stone materials from which CIB points were manufactured are cherts and chalcedonies of a variety

of colors including white and various shades of gray, brown, and tan, the latter ranging to almost an orange, and more than one color may be represented on a point. Sources of chert or chalcedony occur on all three islands, and each source is associated with a variety of colors. On Santa Cruz Island, chert occurs at many locations in the eastern sector of the island (Perry and Jazwa 2010), but at least one other chert source is suspected to be present in the central sector of the island. Chalcedony also was used for flaked stone tools throughout prehistory on this island. Two types of chert occur on eastern San Miguel Island in different bedrock contexts: Cico chert (Erlandson et al. 1997) and Tuqan chert (Erlandson et al. 2002). When the points at the AMNH and the NMAI were studied, an attempt was made to identify stone material, but unfamiliarity with the sources on San Miguel Island resulted in most being identified as simply chert or chalcedony. It is likely that most CIB points were made of cherts occurring on San Miguel Island. Although the CIB points from the Punta Arena site on Santa Cruz Island initially were identified as Santa Cruz Island chert (Glassow et al. 2008:47), these too may be of one or the other cherts occurring on San Miguel Island. A few CIB points appear to have been made from a newly identified chert found on Santa Rosa Island, an opaque variety called Wima chert by Erlandson et al. (2012). Other sources of chert used for CIB point manufacture may now be submerged, given chert cobbles with no known bedrock source are found on raised island beaches (Erlandson et al. 2012), and that sea level has risen approximately 30 meters since the first CIB points were made.

DISCUSSION

CIB points were probably manufactured from relatively thin flakes detached from cores that underwent some amount of preparation so that flakes of desired dimensions could be produced. Shaping of the point clearly entailed a great deal of care in pressure flaking. Jew and Erlandson (2013) have also argued that island cherts were intentionally heat-treated by Paleocoastal peoples to enhance the production of such thin and delicate points. The complex form of the blades on many of the points appears to have been the result of two objectives: prominent barbs and very acute-angled tips, although rejuvenation of the tip may account for some of this complexity.

Patterning in the distribution of the subtypes in space and time is expected, given that the points occur on the three larger northern Channel Islands and apparently were made and used for more than 4,000 years. For instance, the occurrence of only the Short subtype at the Punta Arena site, dating to the end of the period of the CIB type's use, suggests that this subtype may be peculiar to that period—although some very small and morphologically similar points have come from deeply buried and well-stratified contexts in an ~11,700-year-old component at CA-SRI-512. Currently, associations with dated archaeological deposits are too few for effectively investigating such possibilities.

A fundamental issue, of course, is whether particular aspects of the formal variation are functional or stylistic. The form of the Long-barbed subtype, for instance, may be largely stylistic, and these points may not have been used for routine hunting. Instead, they may have signaled the competence of individual knappers or perhaps a social unit such as a group of kin-related knappers. Conversely, the form of the Medium subtype, which includes the largest number of points, may have been largely governed by utilitarian requisites associated with hafting and hunting, although the variation within this subtype may by stylistic—the kind of stylistic variation that Sackett (1982:72–73, 1986:630) has termed "isochrestic," that is, stylistic variation resulting from selection by the knapper among functionally equivalent forms. Many of the differences between subtypes, however, may be strictly functional, in that one subtype may be associated with spear-fishing, another with hunting birds, and yet another with hunting sea mammals. For instance, the difference in stem breadth between the Long-barbed (7–9 mm.) and Broad-stemmed (10–14 mm.) subtypes implies hafting onto shafts of different diameters. This distinction implies differences in shaft sturdiness and consequently the function of the spear or dart.

Heye (1921:68) asserted that a CIB point he illustrated in his monograph was of "entirely too delicate a character to have been utilitarian; it may have been hung from the neck as a pendant, although its shape would seem to preclude its use as such, or it was possibly set in a bone shaft and used as a hair-ornament." As Heye implies, the shape of CIB points does not lend itself

to such uses, and probably all were hafted onto spear or dart shafts and served primarily a utilitarian function. Indeed, the morphology of CIB points hints at aspects of their function. The acute-angled tips suggest the importance of the ease and depth of initial penetration of animal flesh, and the thinness of the points implies the same. Prominent, sharp barbs would have widened the wound and increased lethality, but also suggest a concern that the point remain imbedded in animal flesh.

The delicateness of most finished CIB points may indicate that the spears or darts the points tipped were used primarily in aquatic settings, where they may have survived if the target animal was missed. A spear or dart thrown over land that missed its target almost inevitably would have resulted in breakage of the point when impacting the ground. Alternatively, spears armed with CIB points may not have been thrown at all, but instead were thrust; that is, the spear did not leave the hand of the user. More specific inferences about the function of CIB points must await more data on their association with various kinds of faunal remains, but their occurrence on the northern Channel Islands, where no terrestrial animals of significant size lived since the extinction of the pygmy mammoth (Agenbroad 2002), suggests that they were used to acquire one or more kinds of marine or aquatic vertebrates.

There is a strong possibility that many more points than were grouped into the Modified subtype were rejuvenated when a blade, barb, or stem broke. This possibility may account for the considerable variability in the Medium subtype. Even if the points were the tips of thrusting spears, breakage is likely to have been a common occurrence, given the thinness of CIB points relative to their size. The very acute-angled tips on the points would have been particularly susceptible to breakage, as reflected in the fact that many CIB points in the collections are missing 1–3 mm. of the tip.

CONCLUSIONS

The considerable knapping skills required to make CIB points are comparable to those involved in creating the finest Paleoindian and early Archaic projectile point types in North America. In the Santa Barbara Channel region, they clearly are the most sophisticated point types made during more than 11,000 years of prehistory. Their limited geographic distribution, being largely restricted to the northern Channel Islands, implies not only that populations living on the islands were relatively isolated from their mainland neighbors, but also that their ecological adaptation had unique aspects, most likely related to a focus on marine resources. The considerable variation in form, although conforming to the criteria that define the type, likely is patterned in space and time, and we hope the typology presented here will serve as a foundation for investigating such patterns and their determinants.

ACKNOWLEDGEMENTS

We thank David H. Thomas and Anibal Rodriguez at the American Museum of Natural History, and Patricia L. Nietfeld at the Cultural Resources Center, National Museum of the American Indian, for providing access to collections and for aid while Channel Islands Barbed points were being studied at their museums. John Johnson, at the Santa Barbara Museum of Natural History, kindly provided copies of his photographs of points at the Musée du Quay Branly. We also thank Torben Rick, Nicholas Jew, and Jack Watts for freely sharing their data and ideas regarding CIB points. Finally, we thank anonymous reviewers, and the editorial staff of the *Journal of California and Great Basin Anthropology*, for their assistance in the review, revision, and publication of this paper.

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