A UNIQUE ATLATL DART BUNT FROM CA-ORA-365, THE BORCHARD SITE

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This report documents a single specimen of what is possibly a new type of procurement equipment for prehistoric California, the atlatl dart bunt fashioned of stone. A rigorous definition of Abunt@ is offered to distinguish the weapon from other kinds of blunted hunting tools.

The hebetated projectile tip of a missile, whether arrow or atlatl dart, will be called a "bunt" when it has been fashioned from a single piece of manufacturing material (most often wood or bone) and when it possesses two basic structural components, a roundish head and a tapering tail, or stem.[1] Tapering of the tail allows the projectile to be seated into the end of a foreshaft or a mainshaft. Bunts provide some protection for the shaft and necessary weight for proper flight of the missile. Bunts are one kind of "blunt," or weapon component designed generally to stun prey and/or prevent penetration of animal skins or hides. The section to follow provides background information to further explain what bunts might look like as well as to identify certain artifacts that have at times been incorrectly assigned to the bunt category.

The primary purpose of this report is to describe an artifact recovered from ORA-365 (Figure 1) and to identify it as a "stone atlatl dart bunt," our taxon for a kind of blunted projectile tip heretofore unpublished in the literature of Orange County prehistory, if not the literature of Native coastal southern California culture history. Discussion of the specimen (Figure 2a) will focus first on attributes of shape and size, followed by notes on manufacture, maintenance, use wear, lithic material and lithic source characterization, and temporal placement.

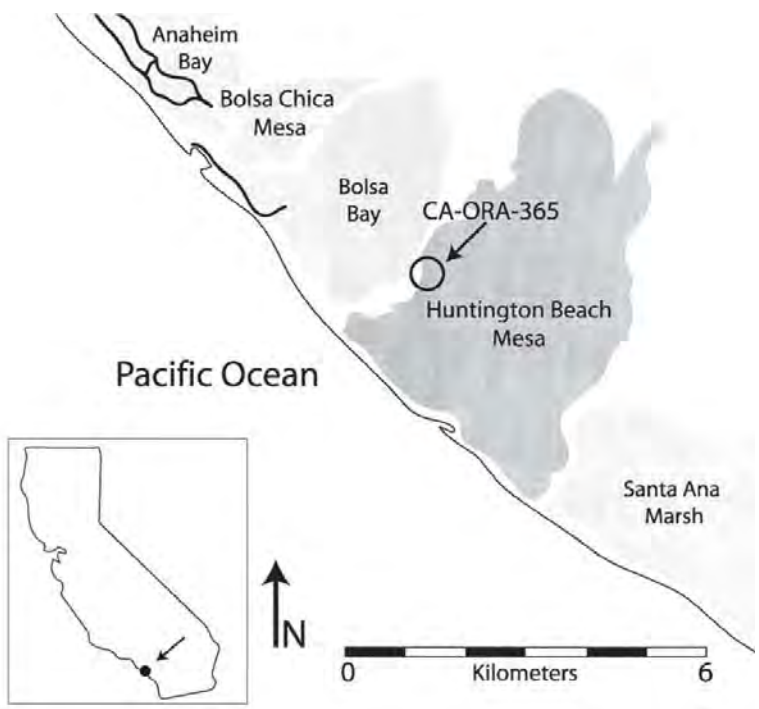
BACKGROUND ON BLUNTED PROJECTILES

Not all blunted projectiles qualify as bunts, and various objects previously interpreted as bunts may be otherwise. Figure 2 illustrates artifacts that are excellent candidates for bunt status. The bone specimen of Figure 2b is small enough to have been an arrow bunt. It was found in a grave on San Clemente Island by Paul Schumacher and reported by Abbott and Putnam (1879:230) who believed the object was a pin. The specimen of Figure 2c is a "*solid wood cylinder whittled to a long tapering proximal end and a blunt, rounded distal end" (Aikens 1970:165) and is identified as an arrow bunt. It was recovered at Hogup Cave, just west of the Great Salt Lake, Utah (Aikens 1970:165, 167).*

Hudson and Blackburn (1982:108, 109) discuss and picture bone arrow bunts (Figure 2d-h) from San Nicolas Island which are presently with the de Cessac collection at the Musée de l' Homme in Paris. They suspect, correctly we believe, that the artifacts may be Eskimoid. It is likely that such projectiles were used by Aleut hunters brought south by Russians to participate in the fur hunting trade.

Certain bird blunts used to stun small birds might consist of "a cruciform arrangement of four short sticks" attached at right angles to the arrow shaft (Hudson and Blackburn 1982:110-111; also Harrington 1942:14), but their morphology disqualifies them from the bunt category (Figure 3a). Another blunt (but not a bunt) discussed but not illustrated in Hudson and Blackburn (1982:112) is a ball of asphaltum molded to the tips of an arrow to protect children engaged in archery practice (Figure 3b).

Figure 1: Location of CA-ORA-365



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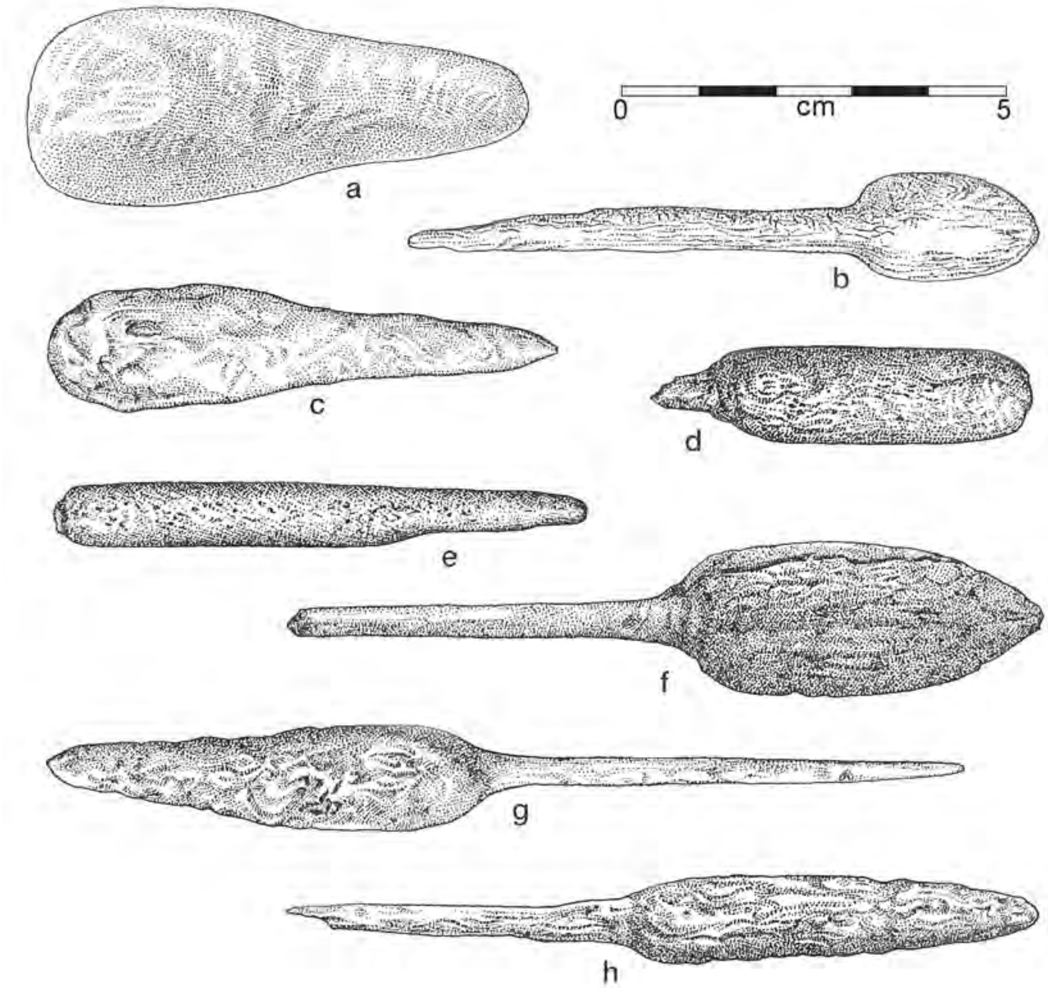


Figure 2: Bunts. (a) stone atlatl dart bunt, CA-ORA-365; (b) possible bone arrow bunt, San Clemente Island (after Abbott and Putnam 1879:230); (c) wooden arrow bunt, Hogup Cave, Utah (after Aikens 1970:167); (d-h) probable arrow bunts (bone), San Nicolas Island (after Hudson and Blackburn 1982:109). (a-c) and (f-h) are to scale, (d) and (e) approximate.

Heizer and Krieger (1956:180-181) illustrate the distal end of an artiodactyl tibia (Figure 3c) from Humboldt Cave in Nevada. The cut end shows some polish. They suggest a possible "bunt" function. This artifact, if fitted over a shaft, would have assumed a "female" role to the "male" shaft. A female blunt is disqualified as a bunt under our definition. The size of the worked tibia artifact suggests hafting to a dart shaft rather than an arrow shaft.

Certain objects illustrated by Gifford (1940:175, 216) bear superficial resemblances to bunts when seen in plan view. These "shoehorn-shaped" artifacts (Figure 4a) seem to be too thin to have been used as projectiles. More likely, they served as personal adornment.

Gifford (1940:178, 224,225) illustrates several conical-headed objects with "flat thin stems" (Figure 4b-d) which Heye (1921:88, Figure 13) had interpreted as arrow points for stunning birds. Gifford contemplated this possibility but wondered why the stemmed portion was laterally rather than centrally located. He thought that if these kinds of objects (Figure 4b-g) (see also Nelson 1910:394, 395; Lillard et al. 1939:Plates 19 h-l, 20 b-e) were blunt heads, the "constriction" along the central portion may have been for firmer attachment to the shaft (Gifford 1940:178). Lateral attachment, however, we suggest, probably would have unbalanced the arrow, spinning it outward from an intended trajectory. Most if not all of the conical-headed objects are likely to have been atlatl spurs (see White 1989).

THE ORA-365 BUNT

Manufacture, Maintenance, and Use Wear

The ORA-365 specimen (Figure 2a) was shaped from chlorite schist into a roughout using direct percussion, after which grinding finalized the distinctive bunt morphology. When finished, the artifact weighed slightly more than its present weight of 53.0 g, and its dimensions were nearly those of the surviving object, 66.1 mm long, with a 26.6 mm maximum width and a 23.9 mm maximum thickness.

Maintenance is apparent in modifications to two flake scars from impact damage on the projectile head. Clearly, the sharp-edged and stepped margins of the flake scars necessitated that they be ground down; otherwise they would have provided platforms that might catch or snag on objects at the moment of landing, thereby possibly restarting a fracture and breaking or shattering the tool.

Use wear is clearly in evidence. First, a brown stain or residue covers the entire tail section of the bunt. Perhaps this occurred because of the tail being forced again and again into a dart mainshaft, repeatedly rubbing stone forcefully against plant fiber. Asphaltum is absent from the tail. Secondly, the distal portion of the head has developed a battering facet from trauma on hard surfaces such as the ground or rocks. The battering is clearly asymmetric, a condition not associated with employment of a small pestle to process, say, a colorant such as ochre. No paint pigment appears anywhere on the artifact. Additionally, two, possibly three, flake scars are at the sides of the bunt head, emanating from the distal end of the head. This indicates spalling during impacts.

And finally, there are striations running at the distal end of the bunt due to the artifact moving against hard surfaces. The direction of the striations, distal to proximal, records the direction of flight.

Material Identification and Source

Fine-grained crystals exhibiting greenish-grey, dull luster provide an immediate indication that the manufacturing material is chlorite schist. Magnification (4.5-7.0 power) reveals sparse occurrences of greyish white crystals of lighter talc schist and/or quartz schist amongst green chlorite crystals, a typical association of minerals for this type of stone.

Further confirmation for mineral characterization turns on hardness tests using a copper penny (3.5 on the Mohs scale), which easily scored most of the crystals, and a steel pin (>6.5 on the Mohs scale) which was necessary to score some of the greyish-white crystals. Talc, chlorite, and quartz hardness levels are, respectively, 1, 2-3, and 7. Talc and quartz crystals powdered to white when scratch tested, but the chlorite powdered to pale greenish-grey. The streaks of talc and quartz are characteristically white, and those of chlorites generally might vary from pale green to grey or brown.

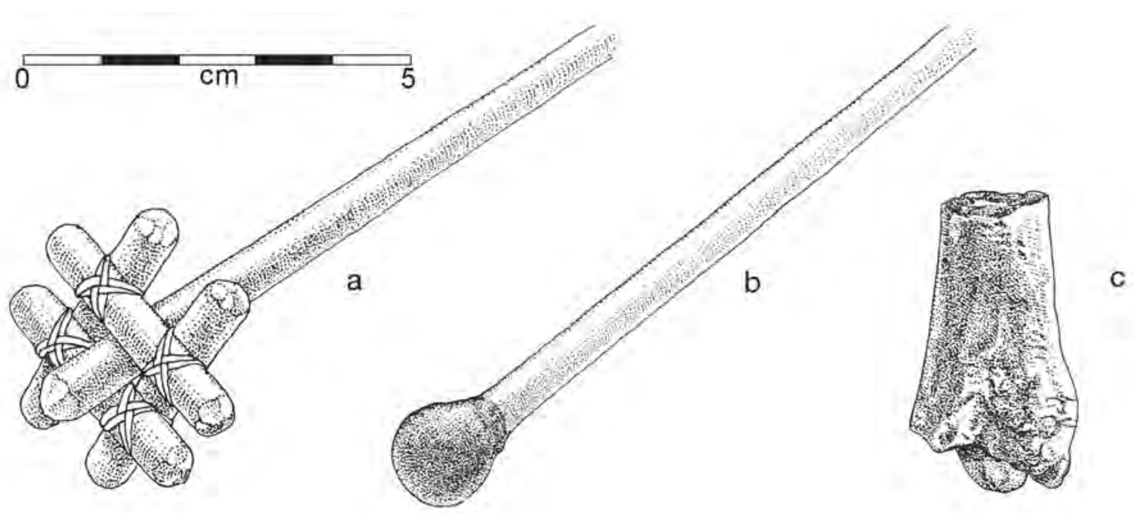
At the point of distal damage on the artifact, there is breakage along lamellar platy habits. This is the type of foliation typical of chlorite schist. Between San Diego and Santa Barbara, chlorite schist occurs in San Onofre Breccia, a middle Miocene phenomenon deposited unconformably atop the Santiago Formation. The most likely source of the specimen material is the San Onofre Breccia at Dana Point, home also to deposits of glaucophane schist, magnetite, mica schist, and quartz schist, materials documented in varied artifact assemblages from the Bolsa Chica Archaeological Project, a research program of Scientific Resource Surveys, Inc. The material of the bunt matches Dana Point chlorite schist, notably with regard to color, grain size, hardness, streak, and mineral constituents.

Dating the Stone Bunt

Spatiotemporal data from ORA-365 are inadequate to assign a date for aboriginal employment of the chlorite schist specimen. The surface find lacks tight associations with either time-sensitive artifacts or radiometric assays. ^{14}C dates indicate human presence at the Borchard site spanning the early Holocene to late Holocene but with the peak of activity clustering, it would seem, within the late Millingstone through Intermediate Cultures period (Desautels et al. 2005). Presence-absence assessment of the material inventory, with regard to time-sensitive artifacts, is generally consistent with this scenario. For instance, arrow projectiles are virtually absent. However, Late Prehistoric period and even Contact period use of the site did occur. Four glass trade beads were recovered. Regarding the other end of the temporal continuum, no plummet-like charmstones or cogged stones were excavated.

No ethnographic/ethnohistoric documentation regarding atlatls collected in coastal southern California provides support for any Late

Figure 3: Blunts (but no bunts shown). (a) cruciform blunt (after Hudson and Blackburn 1982:110); (b) artist's recreation of a blunt; asphaltum molded to distal end of an arrow shaft; c) possible blunt made from the distal end of an artiodactyl tibia (after Heizer and Krieger 1956:181). (a) and (b) scale approximate.



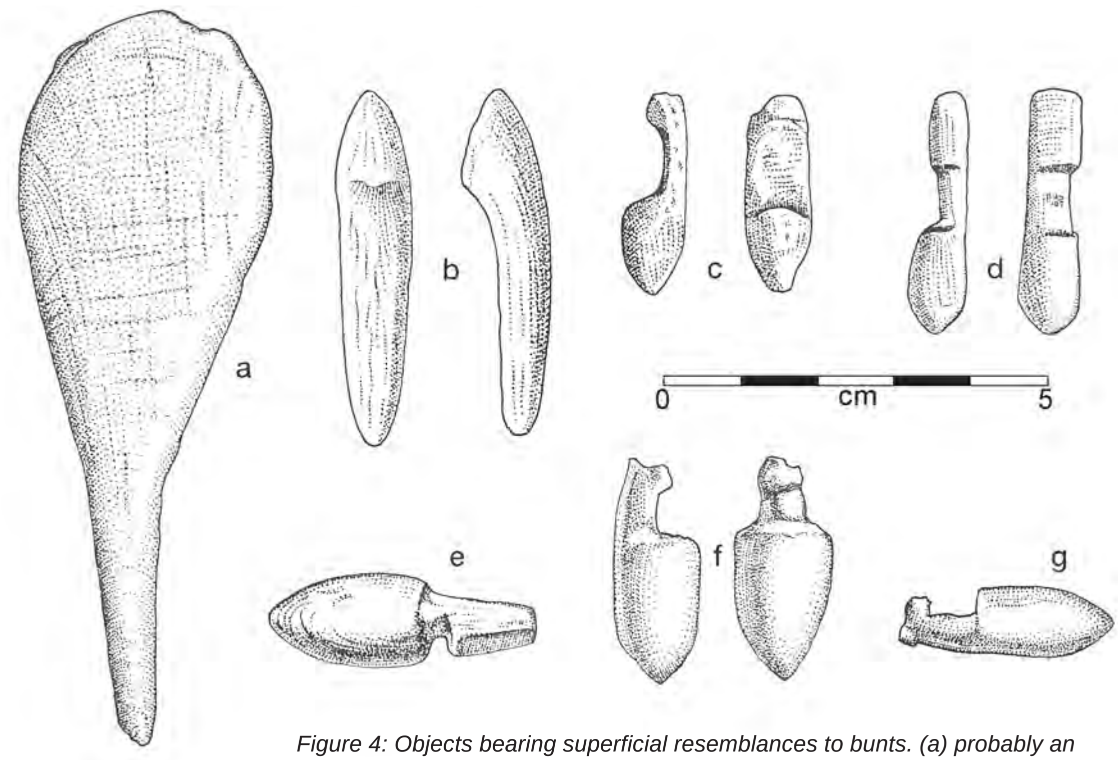


Figure 4: Objects bearing superficial resemblances to bunts. (a) probably an ornament (after Gifford 1940:216); (b-d) probable atlatl spurs (after Gifford 1940:224, 225); (e) probable atlatl spur (after Nelson 1910:395); (f, g) probable atlatl spurs (after Lillard et al. 1939, Plate 20). All shown to scale.

Prehistoric presence of the weaponry system. Parenthetically, there is documentation for atlatl use in the Contact period (Heizer 1945). In one case, a Tarascan-style artifact was introduced into the Santa Barbara Channel area in the Spanish period (Woodward 1937; see also Heizer 1938). In two other cases, spear throwers were brought to the region from Alaska by Aleut and Koniaq sea-otter hunters in the employ of Russian fur traders (Nelson 1936).

Assuming a correct functional interpretation for the specimen in Figure 2a, determination of minimal antiquity for the stone bunt follows an inference, based on projectile point chronologies, that establishes a termination date for atlatl manufacture in California. Present evidence indicates that locally the atlatl and dart weaponry system was replaced by the bow and arrow, which make their appearance between A.D. 400 and 600 (Koerper et al. 1996:261, 276-288, 2002:69).[2] This is around the time that the Intermediate period gives way to the Late Prehistoric period (Koerper et al. 1996:277, 2002:68). We are unaware of any application of superposition or absolute dating technology to atlatl spurs and/or weights to unequivocally support the hypothesis that an autochthonous atlatl mechanical system persisted following widespread acceptance of the bow and arrow in aboriginal California.

Summary and Concluding Remarks

With regard to general morphology, the closest analog for the unusual artifact from ORA-365 is the bunt, a type of blunted projectile tip characterized by its possession of a rounded head and tapering tail, both components formed together from a single piece of manufacturing material. Evidence of maintenance and use wear further supports the hypothesis that this object served as a bunt, and its sheer mass indicates that at one time it would have seated into an atlatl dart rather than an arrow shaft.

Assuming no error of interpretation, the ORA-365 artifact occasions the first published account of a bunt made of stone, at least for Orange County, if not for all of Native coastal southern California or even perhaps the entire state. This addition to the material inventory of hunting technology begs questions of purpose beyond the observation that bunts preclude penetration, thus providing bloodless kills to acquire unsullied pelts and/or feathers. Some bunts might have substituted for bifacial projectile points for atlatl and dart target practice. Considering cost efficiency, the manufacturer of a practice bunt would probably be more likely to select wood or bone for bunts, and thus we are inclined to believe the chlorite schist specimen was intended for employment in actual procurement activities.

On a final and heuristic thought, we speculate that in cases where a stone bunt struck, say, an artiodactyl, deep tissue bruising might have caused the injured quarry to experience muscle cramping and debilitating soreness once it cooled down following a frantic attempt at escape. The process might have been abetted by hunters chasing the wounded prey in circles. Once incapacitated, an animal could have been easily dispatched.

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Notes

1. The lexicon of archaeology generally accepts the use of "bunt" for a blunted projectile (e.g., Aikens 1970:167), although dictionaries allow no such definition to attach to "bunt." Rather, "blunt" is the correct word ("something blunt as a small game arrow" — Webster's Unabridged Dictionary 2001:230). We continue archaeological practice; however, we have chosen to infuse more precision into the subject by limiting the definition of "bunt."

2. Important differences between bow-and-arrow systems and atlatl systems help account for why the former hunting implements might have been rapidly supplanted by the latter weaponry as appears to have happened starting perhaps around 1,600 years ago in coastal southern California. Although both bow-and-arrow weaponry and atlatl-and-dart weaponry are spring-driven, each generating energy which on release becomes kinetic energy (see Farmer 1994:680), a major contrast lies in the observation that with bow-and-arrow, the more important spring in the system (actually a double spring) is the stave, while with the atlatl system, the all-important spring is the missile. Any halt in the forward thrust of an atlatl aborts the throw, with motion of the hunter possibly alerting any quarry of danger. With bow-and-arrow, however, the string is pulled, often slowly, to store up spring energy, and this action may be stopped or reversed with no negative consequence. Indeed, the ability to stop offers advantages as when, for example, the shooter repositions himself to improve his line of sight. The ability to better control the release of kinetic energy allows hunters to minimize movement and shoot from concealment and from a number of positions (King 1989; see also Koerper et al. 1996:277).

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