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Bettinger, Robert L.

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On Bow Staves from Eastern California

ROBERT L. BETTINGER

Department of Anthropology, University of California, Davis,
Davis, CA 95616

A recent review of Wilke’s well-known paper on bow stave procurement underscores the importance of bow technology in aboriginal western North America, and highlights its sophistication as well as the role played by specialists in trade over long distances, both resulting in greater morphological uniformity than would otherwise be expected.

IT IS A FITTING TESTIMONY to Wilke’s field skills and appreciation of both material culture and the ethnographic record that his paper, written nearly thirty years ago on the seemingly minor topic of bow-stave procurement (Wilke 1988), continues to attract attention and to raise interesting new questions. The article by Millar and Smith (this issue) that rekindled this attention does not, as they stress, alter Wilke’s major findings; they simply observe that his suggestions—that bow staves were seasoned on juniper trees (*Juniperus osteosperma*) by means of growth arrest cuts, and that regrowth into stave removal scars would provide ideal wood for future staves—were incorrect. Both suggestions—the seasoning-on-the-tree hypothesis, in particular—seemed to imply that those procuring bow staves were closely tethered to the stands used as sources of wood; the Millar-Smith correction allows for greater residential flexibility.

Of the many remaining issues, perhaps the most interesting is why stave procurement is so concentrated in the hills surrounding Little Whisky Flat and Huntoon Valley, east of Mono Lake. Wilke (1988:24–25) quite sensibly suggests trade. Tioga Pass, west of Mono Lake, provided Little Whisky Flat, and Huntoon Valley groups opportunities for profitable exchange with interior California, where—among manufactured goods—trade in bows ranked second only to trade in beads, with middlemen bulking prominent in these exchanges (Davis 1961:Table 1). While there are many excellent accounts attesting to the trade in bows in aboriginal California (e.g., Hudson and Bates 2016:69–78), data provided by Davis (1961:Table 1) and summarized here in Table 1, furnish the most comprehensive framework for the following brief summary.

Table 1

SOURCES AND RECIPIENTS OF BOWS AND BOW STAVES IN CALIFORNIA (DAVIS 1961:TABLE 1)

Supplier	Recipient	Item
Achomawi	Northeastern Maidu	Bows
Achomawi	Northern Wintun	Bows
Achomawi	Unspecified tribes	Bows
Achomawi	Northern Paiute	Sinew-Backed Bows
Atsugewi	Northern Paiute	Bows
Atsugewi	Northeastern Maidu	Bows
Central Miwok	Yokuts	Bows
Central Wintun	Patwin	Sinew-Backed Bows
Eastern Mono	Tule-Kaweah Yokuts	Sinew-Backed Bows
Eastern Mono	Western Mono	Sinew-Backed Bows
Kato	Coast Yuki	Hazelwood Bows
Mainland Chumash	Island Chumash	Bows
Miwok	Northern Valley Yokuts	Bows
Modoc	Achomawi	Bows
Northeastern Maidu	Northwestern Maidu	Bows
"North"	Pomo	Sinew-Backed Yew Bows
Patwin	Pomo	Sinew-Backed Bows
Patwin	Wappo	Sinew-Backed Bows
Pomo	Wappo	Sinew-Backed Bows
Shasta	Klamath	Bows
Shasta	Modoc	Bows
Shasta	Northern Wintun	Bows
Unspecified tribes	Achomawi	Completed Sinew-Backed Bows
Unspecified tribes	Northeastern Maidu	Wood for Sinew-Backed Bows
Unspecified tribes	Lake Miwok	All Bows
Unspecified tribes	Kato	Hazelwood Self Bows
Wailaki	Yuki	Bows
Western Mono	Southern Valley Yokuts	Sinew-Backed Bows
Western Mono	Kings River Yokuts	Sinew-Backed Bows
Yurok	Karok	Bows

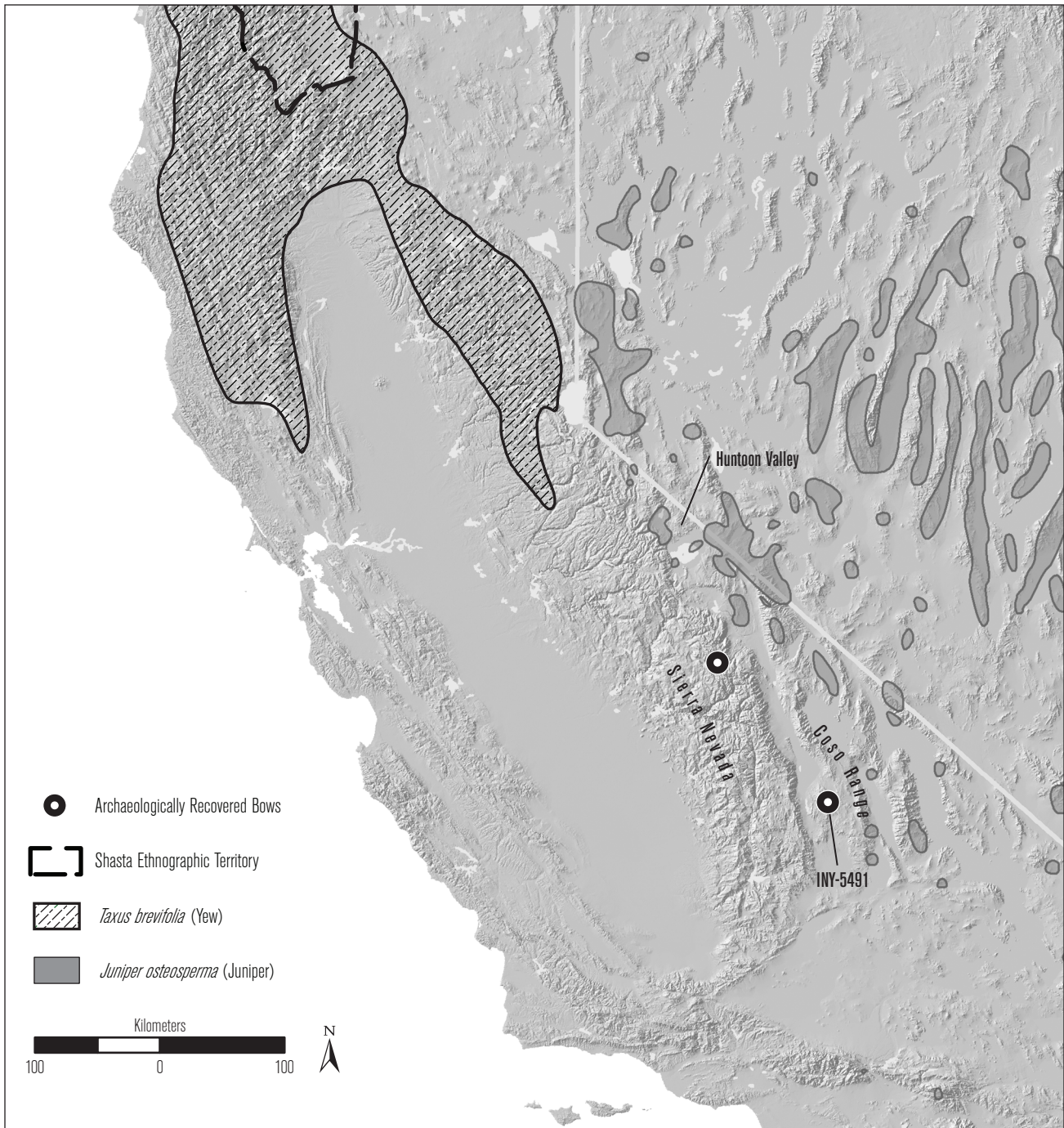


Figure 1. Map depicting distribution of important bow-stave raw material sources in northern California (Yew) and eastern California/Nevada (juniper). Also depicted are the locations of archaeologically recovered bows as described in Haverstock (this issue) and Hildebrandt and Ruby (2003). Bows from northern California Yew were traded from the Shasta in Northeastern California south through the northern Sierra Foothills and Sacramento Valley and west to the North Coast Range. Juniper bows were traded over the Sierra Nevada and into the southern Sierra Nevada foothills and San Joaquin Valley.

The most complex interior California bow trade network originated with the Shasta and the Atsugewi in northeastern California, stretching from there into

the Klamath Plateau, the Cascades, and the northern Sierra Nevada (Fig. 1). The Shasta provided bows to the Klamath and Modoc; the Modoc and unspecified other

tribes in turn provided bows to the Achomawi, who in addition to providing bows to unspecified other tribes, along with the Atsugewi provided bows to the Northern Paiute; the Achomawi and Atsugewi also provided bows—and unspecified tribes provided wood for sinew-backed bows—to the Northeastern Maidu, who in turn provided them to the Northwestern Maidu. In theory, then, a Shasta-made bow could change hands four times: first to the Modoc, next to the Achomawi, then to the Northeastern Maidu, and finally to the Northwestern Maidu. Most of this trade involved sinew-backed bows of yew (*Taxus brevifolia*), the material favored for the best bows wherever it occurred (Driver 1939:417; Garth 1953:153).

The Shasta and Achomawi were also sources for yew bows that moved down the other side of California, into the North Coast Ranges and Sacramento Valley: from the Shasta and Achomawi to the Northern Wintun, and from the Northern Wintun to the Central Wintun (Goldschmidt 1951:337), from the Central Wintun to the Patwin; and from the Patwin and other groups to the “North” to the Pomo, and from the Patwin and Pomo to the Wappo. Presumably, these groups in combination—Patwin, Pomo, and Wappo—provided the Lake Miwok with their bows, all of which were imported (Davis 1961:27), perhaps including some from the Yuki, who obtained them from the Wailaki. Like their inland counterparts, the Coast Yuki were importers, obtaining bows from the Kato, who in turn obtained them from unspecified other tribes. However, the bows obtained by the Kato, and traded by them to the Coast Yuki, were made of hazel (*Corylus cornuta*), presumably because the more desired yew that dominated the Shasta-to-Wappo trade could not be obtained (Goldschmidt 1951:337, 417).

South of Lake Tahoe, bows made from other woods, chiefly Utah Juniper, the preferred Great Basin species (Steward 1941:236), moved west from the Great Basin across the Sierra Nevada and down into the San Joaquin Valley (Davis 1961:27). The most extensive network, exclusively in bows of Utah Juniper (Driver 1937:70), ran from the Eastern Mono (Mono Lake Paiute and Owens Valley) to the Tule-Kaweah Yokuts and Western Mono, and from the Western Mono to the Southern Valley and Kings River Yokuts (see also Wilke 1988:25). A less extensive network moved bows from the Sierra Miwok to the Northern Valley Yokuts¹ and Plains Miwok (Barrett and Gifford 1933:215), although there is some confusion

here regarding materials. While the Sierra Miwok are said to have made their bows from spruce and cedar (Aginsky 1943:408; Barrett and Gifford 1933:215–16), both identifications are problematic: spruce (*Picea*) does not occur in the Sierra Nevada (possibly some species of fir was meant), and the term “cedar” may refer either to Incense Cedar (*Calocedrus decurrens*) or Western Juniper (*Juniperus occidentalis*); the word “cedar” is frequently applied to juniper. Further, given the extensive trans-Sierra trade running through Yosemite Valley, from Mono Lake to the Southern Sierra Miwok (Hull 2007), it does not seem at all improbable that some of the Sierra Miwok “cedar” bows were made from Little Whisky Flat and Huntoon Valley bow staves.

What emerges from this cursory overview is that in both California (e.g., Garth 1953:153; Goldschmidt 1951:331) and the Great Basin (Steward 1933:259), bows were less often homemade than they were the product of specialists, and that preferred woods—yew in northern California and Utah Juniper in the western Great Basin and southern California—were similarly in high demand and widely traded, consistent with Wilke’s speculation that the evident concentration of bow-stave procurement in Little Whisky Flat and Huntoon Valley was related to their position immediately east of a major trade route into California. That bow staves were procured, and finished bows manufactured, expressly for trade is difficult to demonstrate, but morphological variability offers an avenue to explore, since objects produced by a specialist generally vary less as a whole than the same number produced by as many individuals.

There is no hint of anything like this in Wilke’s bow stave data, where specifics of tree shape and condition, as much as harvester preferences, dictated what was possible. Measurable Little Whisky Flat-Huntoon Valley bow-stave scar length has a coefficient of variation of 15% (standard deviation of 17.8 cm., expressed as a percentage of the mean, 117.5 cm.; $n=75$), roughly the same as manos from Chaco Canyon (17%) and Owens Valley (22%; Eerkens and Bettinger 2001:Table 1), with natural variation in raw materials generating significant item to item variation in all three cases. Unfortunately, we have no sample from which to measure variation in finished bows made from these staves, but the sample of Southern Paiute sinew-backed bows from northern Arizona and southern Utah reported by Fowler and

Matley (1979:61–64) offer relevant insights. As Wilke (Wilke 1988:5) notes, the 14 Southern Paiute examples average 97.5 cm. in length—closely approximating what one expects of a finished bow made from staves the size of those harvested at Little Whisky Flat-Huntoon Valley. More importantly, the coefficient of variation in length of these finished bows is just 6.7%, which is at the very low end of the variation observed across a wide range of artifact types as reported by Eerkens and Bettinger (2001), suggesting either a very strongly defined and widely shared Southern Paiute mental template, or—as seems more likely—production by a handful of specialists with well-defined ideas about how a bow should look. Two archaeological juniper bows, found in the Coso Range in ethnographic Panamint territory and reported by Hildebrandt and Ruby (2004), indicate the extension of this pattern into California in prehistoric times; they measured 99.0 and 103.5 cm. in length, and were likely intended for trade. They had been cached unfinished, as a pair, either by a local specialist who shared the Southern Paiute notion of ideal bow length, or a middleman who had obtained them from such a specialist—perhaps one of those serving the southern Utah to northern Arizona bow trade. One presumes that bows made from Whisky Flat-Huntoon Valley staves would show the same lack of variation, indicative of production by specialists.

There is certainly much more to be done on this topic. It is now possible, for instance, to source plant material with sufficient accuracy to determine the origin of wood used in California bows (Benson et al. 2006; English et al. 2001). Furthermore, although unfortunately long ignored, dendrochronological dating has great potential for dating Utah Juniper (Derose et al. 2016). The lasting impact of Wilke's bow-stave paper in any case is clear.

NOTES

¹This is a generalization from Davis (Davis 1961), who specifically notes the bow trade from the Central Miwok (i.e., Central Sierra Miwok) to the Yokuts (Davis 1961:17), and from the Miwok to the Northern Valley Yokuts (Davis 1961:33).

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