

**POLYNESIAN SEAFARING AND AMERICAN HORIZONS:
A RESPONSE TO JONES AND KLAR**

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The hypothesis presented by Jones and Klar (2005) that elements of prehistoric Chumash technology and language arrived from East Polynesia is considered. Trans-oceanic diffusion in general should not be rejected out of hand, but in this case it is improbable that it involved East Polynesia. There are substantial differences in the sewn-plank canoes at issue and the compound hooks are of a general form that is not confined to Polynesia. The chronology of East Polynesian colonization is probably too late for diffusion to southern California before A.D. 700. East Polynesian seafaring may have been inadequate to reach the Californian coast. If the explanation is diffusional, then a source in East Asia is more plausible.

En este trabajo se considera la hipótesis presentado por Jones y Klar (2005) de que elementos prehistóricos tecnológicos y lingüísticos de los Chumash llegaron desde Polinesia. En general, la difusión cultural transoceánica no siempre debe ser rechazada, pero en este caso es poco probable que las influencias sobre la cultura Chumash incluyeran Polinesia del Este. Es importante reconocer las diferencias entre las canoas de tablón-cosido, y que los anzuelos compuestos de dos piezas son de una forma no exclusiva a Polinesia. La cronología de colonización de Polinesia probablemente es demasiado tardía para una difusión a California antes de 700 A.D. Además, la tradición marítima de Polinesia puede no haber sido adecuada para llegar a la costa de California meridional. Si la difusión explica la aparición de canoas de tablón-cosido y anzuelos de dos piezas en California, su origen en la zona del Este de Asia es más probable.

Jones and Klar (2005) propose that several Chumash words, including *tomol* for the sewn-plank canoe, as well as the canoe itself and curved, compound hooks, represent diffusion from East Polynesia, specifically Hawaii, by the seventh century A.D. As an explanation of apparent cultural similarities, transoceanic diffusion has seldom attracted an archaeological consensus, but carefully argued cases may bring the concept back into mainstream thinking, as in the analogous instance of historical biogeography where the dominance of vicariant separation is weakening as dispersalist approaches to transoceanic distribution have demonstrated systematic similarity, chronological logic, and plausible mechanisms of transport (de Queiroz 2004). The Jones and Klar hypothesis can be considered under the same headings.

Similarity of Items

The pan-Polynesian word for the sewn-plank and other forms of canoe is *waka* (**waka*, **wangka* in

proto-Polynesian). It was used generically but also (*contra* Jones and Klar 2005:476) specifically for different kinds of canoe construction and use, e.g., in Maori: *waka-taua*, *waka-rua*, *waka-riwai*, *waka tete* (single-hulled war canoe, double-hulled travelling canoe, river dugout, fishing canoe, respectively). In Hawaiian there were several terms for canoe using the lexical item *koa*, as Jones and Klar (2005: 475) observe, but *wa'a* (= *waka*) was much more common. Holmes (1993:70) lists five types of Hawaiian canoe with the prefix *koa*, but 28 types prefixed with *wa'a*. The absence of a *waka* cognate in the Chumashan languages is a striking deficiency in the linguistic argument.

In regard to the canoe-building technology, it is unnecessarily restrictive to look only at Polynesian parallels. Sewn-plank construction methods were very widely followed by 2,000 years ago, when they occurred throughout Atlantic Europe, the Mediterranean, Indian Ocean, and, presumably, the Pacific, where they were widespread in the historical era. Sewn-plank construction also

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seems to have prevailed in South-East Asia, at least up to about the seventh century A.D., when iron nails became available. Sewn-plank technology could have reached North America, therefore, from several potential sources, including Polynesia and East Asia (McGrail 2001). In fact, the distribution of sewn-plank boat types favors the latter source area. From the Luzon Strait to the north, many historical boats were plank-built and single-hulled like the *tomol*. Polynesian canoes, however, were constructed generally upon a dugout base, with sewn-planks attached above, a different concept. Further, it seems unlikely that Chumash would have discarded the manifest advantages of multi-hull or outrigger construction including the ability to carry a sail. Only canoes with unusually wide beam could carry sails safely at sea, and in the Americas, accordingly, sails were recorded only on the beamy *umiak* and the South American raft (McGrail 2001).

The curved forms of compound bone fishhooks that occur in southern California are quite simple by East Polynesian standards, which often run to the baroque. The similarity is therefore more generic than specific and, in fact, the Californian hooks are just as similar to Japanese types from the Jomon era onwards, some of which survived into historical times in Hokkaido (Anderson and Akazawa, 1986).

Chronological Logic

The origin of the *tomol* and curved compound hooks of southern California in East Polynesian technology encounters a chronological problem. How early East Polynesia was first settled is still debated, but on current archaeological data it is difficult to see how it could have been earlier than about cal. A.D. 800–900. Much earlier dates from older research have been discarded progressively in the light of new results from the same sites and from dating of newly discovered colonization sites (Anderson 2000, 2003a; Anderson and Sinoto 2002). Similarly, proxy methods of dating colonization, as from palynological research (Anderson 1995, 2002; Burney 2002; Burney and Burney 2003), and from mtDNA analysis of rat introductions (Matisoo-Smith and Robins 2004) are also converging on a late first millennium A.D. colonization era.

This is not too far from A.D. 625–700 dates on

tomol, if those include substantial storage age from old timber, but dates about A.D. 500 (Arnold and Bernard 2005) for *tomol* and curved compound hooks (Jones and Klar 2005:464, 466) are almost certainly too early for a Polynesian connection. It is also important to note that the two types are not necessarily independent pieces of evidence; the advent of the *tomol*, with its new fishing opportunities, may have stimulated the reshaping of the compound hook.

Plausible Mechanisms of Transport

In the virtual absence of any relevant material remains from prehistoric archaeology, all propositions about the nature of prehistoric Polynesian seafaring remain unblemished by the adduction of direct evidence and we are reduced to arguing on uncertain, indirect grounds: historical traditions and observations, experimental archaeology, and consideration of colonization patterns relative to the voyaging environment. As Jones and Klar have not understood the extent of my departure (Anderson 2000, 2001) from the current consensus about Polynesian seafaring, and as this matter is critical to their hypothesis, the main grounds are noted briefly here.

The modern, or neotraditional, consensus asserts that the colonization of East Polynesia occurred by means of navigation and in vessels that were both superior to those existing at the arrival of Europeans (Finney 1979, 2003; Irwin 1992, 2000; Lewis 1994). Yet, historical observations of Polynesian seafaring from the early seventeenth to early nineteenth centuries indicate not *devolution*, but *evolution*, of Polynesian canoe technology within indigenous Oceanic traditions (Anderson 2000). Some elements of West Polynesian design had reached East Polynesia by the eighteenth century, but canoe design in Hawaii and elsewhere maintained a combined paddling and sailing focus (Finney 1979) in which the ability to sail upwind was at least very restricted and in assumed older designs did not exist at all (Anderson 2000, 2001).

The large, experimental, double-hulled canoes such as *Hokule'a* (Finney 1979, 2003) are not replicas of early historical vessels. They rely on European technology and have sail areas about twice those that can be estimated from historical records

(Anderson 2001). Their performance data, used in computer simulated voyaging, constitute an unacceptable analogue for prehistoric sailing capabilities. In fact, if the experimental performances had prevailed prehistorically there should not have been the long pauses in the remote oceanic migration sequence that are now generally accepted by Polynesian archaeologists and there ought to be more evidence of two-way sailing than exists (Anderson 2003a, 2003b; Pawley 1996).

Consequently, if early East Polynesian voyaging occurred in vessels that had no effective windward capacity, then their ability to reach California was very limited. The Jones and Klar hypothesis requires Hawaiian canoes to tack north for 10–15 degrees of latitude to pick up the consistent summer westerlies. This would have required a robust upwind rig of a type not recorded on Hawaiian canoes and, even were it available, the determination to beat close to windward over several weeks before filling away on the westerlies. A potentially important caveat should be entered, however; the impact of moderate to severe ENSO (El Niño-Southern Oscillation) episodes can change all sailing conditions in the tropical Pacific, and even further afield (Anderson et al. 2005). The impact of climatic change by ENSO or otherwise on first millennium A.D. sailing conditions from Hawaii to California needs to be investigated.

Summary and Discussion

On the three grounds reviewed here, the Jones and Klar hypothesis is not strongly supported. There is only a generalized similarity between East Polynesian and Chumash sewn-plank canoes and some notable differences in construction and architecture. Conversely, there are stronger similarities with Micronesian and East Asian single-hulled vessels. The compound hooks are of simple forms that are not exclusive to Polynesia. The chronology of the relationship is approximate and depends on the assurance that no *tomol* were built earlier than about cal. A.D. 800–900. The plausibility of a seafaring connection depends on neotraditional Polynesian views about canoe capabilities, but there are other perspectives that may provide a better fit to the necessarily indirect evidence.

If not a Polynesian connection, then what explains the Chumash case? The prior existence in North

America of compound hooks and sewn-boat construction in bark and hide might suggest that neither of the two Californian material phenomena in question was sufficiently far removed in type or technology to exclude local development, perhaps in response to opportunities afforded by offshore fishing and two-way contact with the Channel Islands. Irrespective of whether the planked canoe has a deep (Fagan 2004) or shallow antiquity, successful seafaring across the Santa Barbara Channel began some 12,000 years ago (Erlandson et al. 2004).

However, if the explanation is diffusionary, then a stronger case might be revived for an East Asian connection. Compound hooks of similar forms and sewn-planking, in framed vessels rather than as strakes on dugout canoes, existed during the first millennium A.D. in Japan, for example, and the well-known frequency at which traditional East Asian fishing vessels drifted to California in the late eighteenth and nineteenth centuries, sometimes with living crew (Johnston 1988), offers a potential alternative to the Polynesian connection and one that, by the disposition of winds and currents, was easier to accomplish even if it took longer.

Long-distance diffusion is not just possible in the Pacific but seems certain in the case of the prehistoric movement of the South American sweet potato (*Ipomoea batatas*) and possibly other cultigens, to the Pacific islands. Archaeological evidence of prehispanic rafts and daggerboards in Chile and Peru respectively, and early Spanish observations of seagoing rafts using daggerboards (*guares*) in conjunction with triangular sails (neither spritsails nor lateens of clear Oceanic origin), indicate that a suitable South American vessel existed to reach East Polynesia (Edwards 1974). As the route was downwind in prevailing easterlies, it is an argument of attractive simplicity. The alternative, that Polynesian sailing canoes stood south from Easter Island into the westerlies, then east to Chile, and north to the tropics before sailing back west (Green 2000), is more complex and begs questions about seakeeping and the extent of Polynesian-Amerindian contact. But whichever way it happened, it is clear that diffusion from America occurred after Polynesian colonization of East Polynesia, not in the founding migration as Heyerdahl (1952) had proposed.

An interesting case has been made for Polynesian contact with south-central Chile that, while

cautious in its conclusions (Ramírez-Aliaga et al. 1992), cites some Mapuche words that are plausibly of Polynesian origin, hand clubs strikingly reminiscent of the Maori *patu wahaika*, stemmed obsidian artifacts of Polynesian form, and a sewn-plank canoe, the *dalca*, which has been recorded since at least A.D. 1553. However, there are no stratigraphic or other prehistoric contexts for the hand-clubs nor any that appear certain for the other artefacts. The *dalcas* exist at the northern end of a sewn-boat tradition that extends, in bark, to Tierra del Fuego, and it is seldom difficult to find some words that have similar meanings between almost any two languages.

Yet, there is no reason *a priori* why some elements of North and South American coastal prehistory may not have Pacific origins given the advanced maritime technologies in the west and central Pacific, and in East Asia, during the mid-to-late Holocene. Jones and Klar may have missed the mark specifically, but their willingness to reopen discussion of transoceanic diffusion is encouraging.

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