Edwin Doran, Jr., *Wangka: Austronesian Canoe Origins.* College Station, Tex.: Texas A&M University Press, 1981. Pp. 112. $15.00.

The Austronesian people--inhabitants of Polynesia, Melanesia, Micronesia, Indonesia, and Madagascar connected by a single language phylum--lived by and from the sea and occupied a greater area of the worlds surface than any other group. In this command of the oceans they developed three major types of vessels: the double canoe, the single outrigger, and the double outrigger. The authoritative authors, A. C. Haddon and James Hornell, have presented a theory that double outrigger canoes were the oldest type, and Hornell has also claimed that single outriggers were the precursors of double canoes. Professor Doran presents his evidence for disagreement in this fairly ingenious contribution to the understanding of Austronesian culture history as a whole. His progression of development is from the double canoe to the single outrigger and thence to the double outrigger. The progression is logical, but elements of the arguments from which he adduces it are perhaps less convincing. He writes:

> I shall analyse canoe seaworthiness and conclude by examining the distributional evidence in greater detail than that of earlier studies. I hypothesize on the basis of all the facts that double canoes, then single outriggers as used in Polynesia are the oldest Austronesian boat types, followed by Micronesian and Melanesian single outriggers of different sail type, and most recently by Indonesian double-outrigger canoes. The center of complexity of Austronesian boat traits lies in the islands surrounding Sulawesi, and that is probably the center of innovation from which many traits spread outward. It will be noted, however, that the highest development of single-outrigger canoes was reached in Micronesia and that the place of origin of double outriggers was probably Vietnam.

Almost equally divided between text and illustration, Doran's short thesis seems to suffer from a paucity of information. Since the voyaging double canoe did not long survive the competition of the schooner and the marine engine, his argument has had to depend upon analyses of modem analogues. These are not necessarily as efficient as the vanished vessels. Yet he depends very lightly on historical sources which mostly tend to show the canoe much speedier than the schooner but much more difficult to build and with far less reliable fastenings. More reliance on histori-

cal sources would also supply cogent details here overlooked such as the flanging of planks to increase the efficiency of the joins.

His findings on relative seaworthiness provide strong support for the argument that Polynesian double canoes and single outriggers which are tacked head to wind are seaworthy and are the oldest types. This evidence also indicates that single outriggers and the rare double canoes of Micronesia and Melanesia which are "shunted" from tack to tack are even more seaworthy and are intermediate in age. Finally the analysis suggests that Indonesian double outrigger canoes which are tacked head to wind are the most seaworthy and youngest of Austronesian canoe types. But other evidence might well increase the seaworthiness rating of the double canoe.

Doran's comparison of three hypothetical canoes using a common factor of load seems slanted in favor of the double outrigger to the detriment of the single outrigger and the double canoe. In reality I don't think they can be compared, considering the different functions for which they were built. Neither of the single-hulled canoes could perform the function of the large double canoe which was brought up to a high pitch of efficiency. It bore the brunt of the long voyages which relocated populations. Perhaps more significantly it was a symbol of power as in the early part of this century. The Reverend Thomas West (*Ten Years in South-Central Polynesia,* London, 1865) reported the arrival. in Nuku'alofa of King Taufa'ahau with a fleet of fourteen large canoes, each one of which, he claimed, would carry between 100 and 150 persons. The measurements of one, which he gives, are very much in excess of Doran's example, particularly in the relationship of beam to length. The King's canoe was not the swiftest; the others indeed raced ahead of him to form up in a double. line outside the port as a guard of honor through which he sailed.

These canoes were *kalias,* powerful vessels that carried not only large crews, but the rations which, in voyages of record, supported them for two or three weeks between Tonga, Samoa, and Fiji. West reported that they sailed within three points (33.75 degrees) of the (presumably apparent) wind. Besides the *kalias* the *tongiakis,* smaller and more difficult to handle in rough weather, were used as escort vessels, for example, to keep the fleet in touch with islands it did not propose to visit. West travelled in one from the island of Tungua to Lifuka, a distance of thirty-eight miles covered in three hours, a fairly good run when haste was not essential. At the same time hundreds of outriggers were used for fishing and individual travel. One type did not replace the other but supplemented it.

Doran's basic assumption that innovations in rig or sail design spread outward by contact from a single point of invention ignores the possibility

that similar innovations can be introduced at more than one place. Heyerdahl, in his *American Indians in the Pacific,* presented an illustration of a canoe bailer from the American Northwest coast of the same basic design as bailers used by Polynesians. I have seen the same design in Scotland, but all that suggests is that there are only a few basic shapes for carrying out bailing functions. Resourceful people faced with a problem adopt the most practical solution at hand. In the Trobriands, about 1954, I travelled from Sinaketa on Kiriwina to Kaileuna in a canoe paddled by three men. The first course paralleled the Kiriwina coast. When the wind sprang up the paddlers went ashore, cut three large leaves from a young coconut, fixed them in the bow, and we made a good passage at four to five knots across the ten-mile strait.

That could have been a reversion to the discovery of sail. There are plenty of examples of reversion to earlier boat types. The reed canoes of Easter Island and the Chathams could be cited; they were forced on a seafaring people: by the absence of more appropriate materials. And the Maoris of New Zealand reverted to the single dugout (while developing its artistic decoration) "due probably to the abundance of large trees which provided hulls wide enough to diminish the risk of capsizing, and the outrigger was finally dispensed with as unnecessary." (Sir Peter Buck, *The Coming of the Maori,* Wellington, 1949, p. 202).

So the progression from good to better to best, while attractive, is not consistent; but my reluctance to accept Doran's findings on seaworthiness probably has an emotional content. He writes:

> It has been demonstrated above that the most seaworthy watercraft are the double outriggers of Indonesia; hence these are likely to be the youngest type. Single outriggers of Micronesia and Melanesia are intermediate in location, efficiency and age and the double canoes (and tacking single outriggers) of Polynesia, seaworthy as they undoubtedly are, are less so than craft to the west and therefore are presumed to be the oldest canoe types in the Pacific.

What analysis of this type fails to take into account is the relationship of the man to the vessel. Superbly housed, as Banks and others have described, the great canoes were regarded with veneration, given names, taken into the extended family. Their operation demanded the utmost attention to every detail, and the privilege of giving this duty was jealously guarded. In turn, the vessels developed the men. The combination of

Polynesian man and double-hulled canoe still established a record of daring achievement never approached elsewhere.

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