



## Changing perspectives upon Māori colonisation voyaging

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REVIEW ARTICLE



# Changing perspectives upon Māori colonisation voyaging

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## ABSTRACT

Late nineteenth century scholars accepted the traditional narrative of Māori colonisation occurring c. 600 years earlier by systematic voyaging in multiple canoes. Amplification and revision of traditions in the early twentieth century produced a ‘traditionalist’ hypothesis that envisaged navigated, return-voyaging in fast, windward-sailing migration canoes powered by oceanic spritsails. Construction and sailing of experimental canoes in this image, and the transfer of performance data into computer simulation, reinforced the traditionalist perspective. A recent ‘historicist’ approach’ which analyses historical records of Polynesian sailing technology within an Indo-Pacific context, suggests that the oceanic spritsail developed through the sixteenth century dispersal of the lateen sail, and that earlier East Polynesian and Māori voyaging used a double spritsail, incapable of sailing a canoe to windward. Voyaging to New Zealand, normally upwind into westerlies from East Polynesia, was facilitated by a general reversal of wind directions, AD 1100–1300, into easterlies.

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## Introduction

Specifying the nature and history of Polynesian voyaging has always been difficult. Jacob Roggeveen wrote of the Easter Islanders in 1722 that, ‘the human mind is incapable of understanding by which means they have ever arrived here’ (von Saher 1990, p. 45), and in opening the New Zealand Institute, Governor Bowen (1869, p. 8) borrowed former Governor Grey’s words to remark similarly that pre-European Māori history appeared as, ‘a night of fearful gloom ... [bereft] of aught which can give a certain idea of the past’. Two strikingly polarised essays on Māori origins and migrations, also in the first issue of the *Transactions and Proceedings of the New Zealand Institute* (TPNZI), lent substance to this assessment.

Edward Shortland (1869, p. 2) regarded Polynesians as having Southeast Asian origins and capable maritime technology. He described Māori colonising traditions as historically reliable and ‘more or less perfect and circumstantial [i.e. detailed]’ in showing that Māori were the first people in New Zealand and had arrived about 18 generations ago. William Colenso (1869, p. 59), conversely, described voyaging traditions as a ‘mythical rhapsody ... [in which] there is scarcely a grain of truth’ and went on to assert that Polynesians could not have sailed from Southeast Asia, probably came from Central America, and were

perhaps a separate creation of humans travelling via now-sunken islands to colonise New Zealand long before Māori arrival. Colenso's position was endorsed by William Travers (1872, p. 55) who regarded migration traditions as 'pure fictions' and by Julius Haast (1872, p. 84) who suggested that moa hunters were Pacific autochthones dispersed by geological movement.

Shortland's hypothesis was upheld by William Vaux (1876), a prominent English antiquarian. It was perhaps Vaux's status, as much as his systematic review of the evidence on each side, that was significant in validating for the emerging scholarly community in New Zealand what was already accepted (e.g. Thomson 1859, pp. 57–68) in the popular literature: 'that the Māori stories do rest on ultimate facts' (Vaux 1876, p. 6) and potentially could provide reliable evidence of Māori voyaging.

In practice, and beyond narration of canoe passages, the traditions collected up to the 1850s provided very little about Māori voyaging technology and experience. It was only the emergence of later and more detailed versions of colonising traditions, most particularly those in *The Lore of the Whare-Wananga* (Whatahoro 1915), dubiously arranged and annotated by Percy Smith, that addressed the implicit questions (Sorrenson 1979, pp. 34–57; Taonui 2006). Elsdon Best (1916, 1923) then articulated a set of propositions about early maritime migration in East Polynesia that constituted the 'traditionalist' model of Polynesian voyaging. As the 1914 Hector medallist, Best published in the TPNZI, but his was the only paper devoted to Māori voyaging to appear in New Zealand Institute or Royal Society of New Zealand journals until Addis (2012). Here, I offer a brief account of how scholarly views about Māori voyaging have developed since 1916 by considering 12 key propositions of traditionalist and historicist approaches to the topic. The discussion refers only infrequently to the extensive literature of computer-simulated voyaging because little of it focused on passages to New Zealand, most of it assumes sailing characteristics based upon debatable ethnographic parameters and all virtual canoes have been sailed in modern oceanic wind conditions.

### Accepted traditionalist propositions

Most of the propositions (nine) are traditionalist in origin, and not just because of the longevity of that perspective. Traditionalism still prevails because it offers plausible and widely accepted accounts, several supported by subsequent scientific research, of some basic voyaging characteristics, as follows:

1. *Polynesian migrants set out on long migration voyages because of strife in the home islands.* That is stated explicitly in the earliest-collected traditions, which specify the people and circumstances that led to the building and sailing of migration canoes, effectively into exile.

2. *Astral observation allowed navigation with tolerable accuracy over long distances.* Navigational ability has been argued at length but it is no longer a major issue. Observation of successive rising and zenith stars could be employed to navigate along latitudinal courses and, with accumulating experience, to establish latitude on north–south passages. Distance run east–west could be estimated roughly by dead reckoning (Lewis 1994).

3. *Island discovery involved deliberate voyaging.* Although reliant upon accidents of discovery in the first instance, migration voyaging appears intentional. Early simulation of voyaging showed that East Polynesian discovery could not be attributed, in the main, to

drift voyaging (Levison et al. 1973). Archaeological evidence that the marginal archipelagos in East Polynesia, and the outlying islands around New Zealand, were each found in 'starburst' events punctuating long periods of little or no migratory movement suggests deliberate exploration (Anderson 2015).

4. *The colonising population, coming on multiple canoes, was relatively large.* Migration traditions link the main canoes that came to New Zealand in narratives suggesting that they set out or landed at about the same time. Some 12 to 20 canoe traditions mention the names of prominent crew and provide whakapapa for them down to the nineteenth century, for example of 30 men and 10 women who arrived on the *Tainui* canoe. If there were 12 such early canoes then the founding population might have been about 300–500 people. Genetic data also suggest that the founding population numbered several hundred each of men and women, if not more (Penny et al. 2002).

5. *Long-distance sailing came to an end in the late fifteenth century.* Tahitian double canoes were still making two-way passages to Tonga at the arrival of Europeans, but traditional and archaeological evidence agree that contact between central East Polynesia and the outlying archipelagos (notably Hawaii, Easter Island and New Zealand) was at least very rare after the fifteenth century (Irwin 2006, p. 91).

### Debated traditionalist propositions

Four additional traditionalist propositions have been contested, particularly through 'historicist' approaches that emphasise close reading and critical analysis of traditional and historical sources (Sharp 1957; Parsonson 1969; Anderson 2000, 2008).

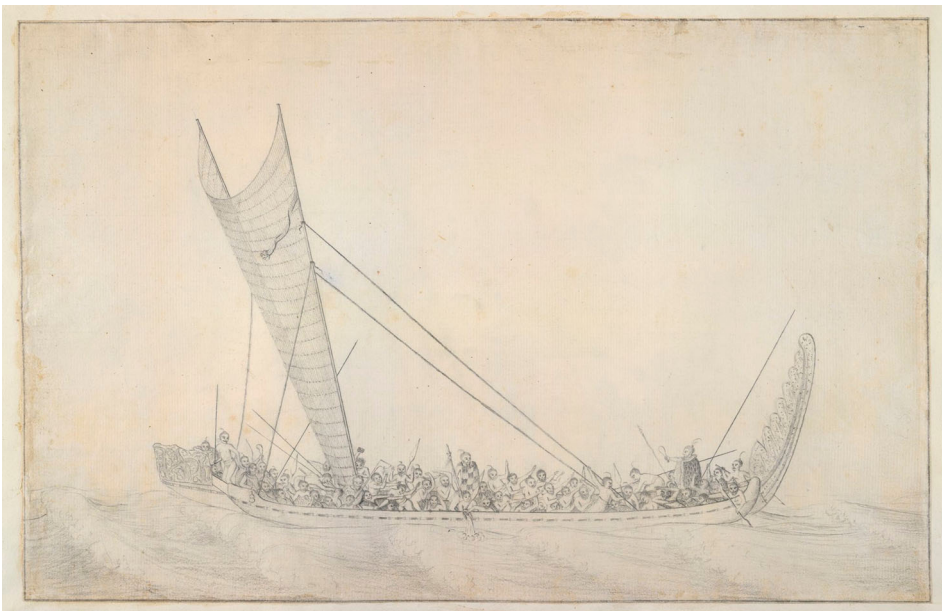
6. *Migration canoes could sail to windward.* Early traditionalists asserted that colonising canoes could sail to windward nearly 'as well as a modern schooner' (Whatahoro 1915, p. 34), and modern experimental double canoes such as *Hokule'a* and *Te Aurere* are built to sail effectively up to 75° into the wind (Beaglehole 1962; Finney 2006; Howe 2006). This capability is facilitated by widely-set, v-sectioned hulls, heavily-stayed and tensioned masts, halyards and large dacron sails, often including headsails. However, early historical evidence shows that East Polynesian canoes had hulls relatively close together (often < 1 m apart, 0.3 m for Māori double hulls), sail areas only c. 50% of those on experimental canoes, no separate mast, few stays, and no halyards, tensioning devices or headsails (Anderson 2001). Windward sailing ability was rare. It is undocumented for large early historical Hawaiian double canoes, it was absent for Marquesan double canoes (Dening 1974, p. 241) and Joseph Banks wrote of Māori canoes that, 'we very seldom saw them make use of sails and indeed never unless when they were to go right before the Wind'. If Tahitian double canoes had some windward capacity, that might have been a recent innovation (below).

7. *Migration canoes could make fast passages over long distances.* The traditionalist assumption that migration canoes could average 4–9 knots is materialised in modern Polynesian double canoes built and rigged to sail at an average of around 5 knots, and up to 12 knots on a broad reach. This level of performance is based on careless reading of historical accounts, notably of James Cook's remark (Beaglehole 1955, p. 157) that Tahitian voyaging canoes 'may with ease sail 40 Leagues a day or more [average of 5 knots]'. His figure came from Tupaia's estimate of passage duration sailing before the trade winds from Raiatea to northern Tonga (1300 nautical miles), as 10–12 days. But Tupaia also said

that it took 30 days or more to return (at 1.8 knots or slower against the trade winds). Therefore, the return voyage of 40–42 days was sailed at an average of 2.6 knots. The inflated sailing speeds of experimental canoes, attributable inter alia to sail areas twice those estimated on historical canoes (Anderson 2001, 2008), have been carried over into most of the computer-simulated voyaging, rendering debatable the results of both approaches.

8. *Newly discovered islands often remained uncolonised until much later, implying effective trans-generational conservation of locational information and frequent return-voyaging.* Insofar as it can, archaeological evidence does not support this proposition. West Polynesian pottery and adzes reached central East Polynesia and some central East Polynesian material reached Hawaii, Easter Island and New Zealand, but no convincing evidence of return from the marginal archipelagos has been documented. Hawaiian and Easter Island obsidian and basalt, and New Zealand obsidian, jade, argillite, chert, etc., are commodities that could be expected, but have not been found, in early central East Polynesian sites (Anderson 2008). Island colonisation chronologies have become much shorter in East Polynesia and the first signs of human habitation are now almost invariably at the beginning of subsequent, continuous, settlement sequences.

9. *After voyaging ended there was degeneration in seafaring technology.* This proposition relies on two related premises: traditional Polynesian wisdom that ancestral skills exceeded those of their descendants, and the argument that attenuation of long-distance seafaring after AD 1500 must have involved declining maritime technology. Together, they have encouraged a belief that later seafaring technology was inferior to that in the age of voyaging, a case in point of Greg Denning's (1963) 'principle of degeneration'. In fact, large double canoes under sail were encountered historically in Tahiti, Hawaii, the Marquesas



**Figure 1.** Double canoe with double spritsail rig. Herman Spöring AD 1769. Image courtesy of the Alexander Turnbull Library.

and New Zealand. The double canoe seen in 1769 in the Bay of Plenty (Figure 1) had hulls of different form and length and has been described as, ‘temporarily improvised by lashing two single canoes together’ (Irwin 2006, p. 89). However, other double canoes encountered in New Zealand, and later in the Cook Islands, were constructed similarly in a superior–inferior pairing. Most importantly, evidence suggests that, far from degenerating, Polynesian canoe technology was innovating after AD 1500.

## Recent historicist propositions

Recent historicist research has produced three new propositions about the sailing rigs used in early East Polynesia, as follows:

10. *The original sail in Polynesia may have been a rudimentary double spritsail.* It is widely assumed that Pacific sailing began with a v-shaped sail attached to spars joined at the base, and propped up by a strut or attached on one side to a mast fixed by stays (Horridge 2008). Although unsupported by material evidence, the existence of this early type of oceanic spritsail has been defended linguistically by glosses of sailing terms that specify the early existence of its technical attributes (e.g. Pawley & Pawley 1998). A more neutral approach to those terms suggests no more than that sails, spars and running (but not standing), rigging can be inferred. The mastless, double-sprit rig better fits that description (Anderson 2000, 2015).

One double-sprit rig existed historically in the western Indian Ocean, and another from the Bay of Bengal to Polynesia. The latter consisted of a high, narrow, quadrilateral sail attached either side to sprits (spars) that were each held erect by a forestay and brace (or sheet and running forestay). This type of double spritsail may be depicted in the ancient Chinese pictograph for ‘fan’ = sail, which dates back some 3000 years (McGrail 2001, p. 356). A Chinese double spritsail could have been brought into the Indo-Pacific by Austronesian dispersal, and the oldest sail depicted in Indonesian rock art, dating stylistically to 3000–2000 yr BP, is a clear example of it (Lape et al. 2007)—a tall trapeziform sail with lateral spars and no mast. Similar sails continued in use in the western Pacific until the twentieth century, and seem to have been the only sail type in eighteenth century New Zealand. The precise performance characteristics of the double spritsail have not yet been established, but it is unlikely that it could sail effectively on a beam reach or any closer to the wind. It was essentially a downwind rig.

An ambiguous description of the 1769 Māori example has been taken to imply a fixed mast and trailing spar (i.e. an oceanic spritsail), but a precisely-drawn, contemporary sketch showed the rig to consist only of two movable spars with running forestays and sheets (Figure 1); undoubtedly a double spritsail. Banks wrote that Māori sails, ‘were made of mat and instead of a mast were hoisted upon two sticks which were fastened one to each side’. No other instances of these sails are recorded in East Polynesia, but mastless, triangular sails were seen in Vanuatu, and sails wrapped around spars, but with no recorded mast or stays, were seen in the bilges of canoes in several islands along the southern fringes of East Polynesia, including in Rapa (Haddon & Hornell 1975). It is hypothesised that the double spritsail was the sail used in Polynesian migration (Anderson 2000, 2015).

11. *Lateen technology transformed most East Polynesian sailing rigs after the colonising era.* In an unpublished lecture, the historian Gordon Parsonson (1969) argued against the

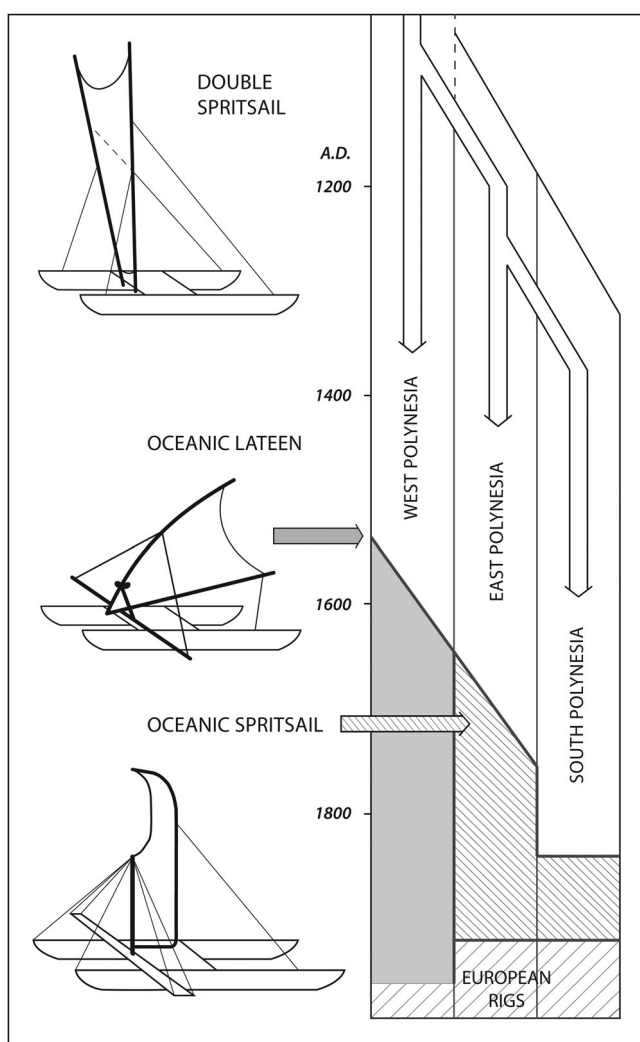
ethnographic assumption that oceanic sailing canoes had been always as they appeared historically and that the introduction of the oceanic lateen sail had caused a 'nautical revolution' in Polynesia. It was later proposed that the oceanic lateen sail (which had a boom and yard) evolved in the Pacific and spread through the Indian Ocean to the Mediterranean, or that the Mediterranean lateen, which had no boom, was carried into the Indian Ocean by Arab seafaring and reached the Pacific in the first millennium AD (Campbell 1995). Historical evidence supports neither suggestion. The Mediterranean lateen, c. 2000 years old, does not appear in Indian Ocean historical records or rock art before Portuguese shipping c. AD 1500 (Whitewright 2011). It could have arrived earlier (McGrail 2001, p. 278), but its sudden florescence in the Indian Ocean in the sixteenth century suggests that it was recently introduced. It is hypothesised that this lateen technology dispersed into the Pacific where it was recorded in Guam in 1521 and in Tonga at 1616.

Some lateen traits were recorded further east, notably the stayed mast and balance board in late eighteenth century Tahiti. It is hypothesised (Anderson 2000, 2015) that the former double spritsail was transformed into the oceanic spritsail by the arrival of lateen technology (Figure 2). The logic of technical change would mean that stepping one spar as a mast compelled the other spar to be attached to it and released the dependent spar as a manoeuvrable trailing edge to the sail. Joining the spars induced rounding of the formerly horizontal foot of the double spritsail, as often occurred in Tahiti, or more simply required a v-shaped sail. The plausibility of oceanic spritsails originating under lateen stimulus is supported by the early historical distribution of the oceanic spritsail around the distal margin of the distribution of the oceanic lateen (Haddon & Hornell 1975, p. 83), and an improved sailing ability was reflected in the relatively extensive geographical knowledge of the eighteenth century Tahitians compared to other East Polynesians. Aspects of the new Tahitian rig, notably the stayed mast, reached Hawaii and the Marquesas, but not New Zealand or other distant archipelagos.

This discussion implies that the double spritsail rig was used in the long migrations to marginal East Polynesia, including New Zealand and, as it was only effective with the wind abaft the beam, course directions must have been heavily constrained and passage speeds in varied wind conditions significantly slower than under the oceanic spritsail.

12. *East Polynesian migration occurred in wind conditions dissimilar to those of modern times.* In the scarcity of long-term data it has been necessary to assume that sailing conditions over the long term were much as they are today. Colonisation of tropical East Polynesia would then have pushed upwind against the trades going east, and also upwind against mid-latitude westerlies going southwest to New Zealand, hence the emphasis upon weatherly technology in traditionalist perspectives. This has been illustrated in simulated voyaging which found that, in normal, modern conditions, passages from Samoa to the Marquesas, Society and Cook Islands were feasible for only a few weeks a year even when canoes could sail to within 75° of the wind direction, and that without that weatherly capacity easterly passages would have been very difficult (Di Piazza et al. 2007).

Scholars, accordingly, have emphasised the importance of wind reversals, especially in El Niño conditions, in facilitating eastward sailing in the tropics. El Niño frequency peaks during the late Holocene coincide with the main episodes of long-distance eastward migration in the Pacific (Anderson et al. 2006), but New Zealand lies in the mid-latitude westerlies, head winds for seafarers from tropical East Polynesia. New research on the



**Figure 2.** Historicist view of change in East Polynesian sailing rigs. The double spritsail is the original rig everywhere; the oceanic spritsail is an innovation that incorporates lateen technology but it is not in New Zealand until the 1820s; by the late nineteenth century European rigs prevail everywhere.

decadal movement of pressure systems since AD 700 shows, however, that the westerlies were largely replaced, AD 1100–1300, by winds from the easterly quarter that flowed over New Zealand and its outlying islands; conditions suited to downwind migration until the westerlies resumed soon after 1300 (Goodwin et al. 2014). A migration canoe sailing at 4 knots in fair winds of 15–20 knots could have reached New Zealand from Rarotonga in > 20 days, although a return passage would have been very difficult.

## Conclusions

The basic, and prevailing, model of Māori voyaging was conceived in the early twentieth century by liberal exegesis of Māori traditions, some newly brought to light and more

detailed than hitherto. Despite the debatable nature of the process, much of what was proposed was at least plausible and some propositions have been supported by subsequent historical and scientific research. Nevertheless, assertions about sailing technology, in particular, have become problematic in the absence of a systematic, historical approach to replication in the construction of experimental voyaging canoes. The eclectic collation of technological elements from across the Pacific and beyond (e.g. Finney 1994) has served only to support a circular argument that ethnographic evidence implies powerful sailing vessels and is validated by constructing them. The results have limited the usefulness of both direct experimental and computer-simulated sailing as methods of testing hypotheses about Polynesian seafaring.

A counter approach emphasises close analysis of the historical data upon which assumptions about pre-European Polynesian voyaging have been based. This model questions the ethnographic perception that sailing technology in the era of East Polynesian colonisation is represented fairly by evidence from the era of European exploration. Historicist propositions argue that the oceanic spritsail had a limited distribution that did not include New Zealand, and that it developed after the era of East Polynesian colonisation by incorporating elements of lateen technology that arrived in West Polynesia after the fifteenth century. The implication is that East Polynesian colonisation in the eleventh to thirteenth centuries occurred under an older sailing rig, the double spritsail, which was limited to sailing off the wind and made the process of colonisation more difficult and isolating than is assumed in traditionalism. Historicism also questions long-term continuity in sailing conditions, and recent research suggests that a phase of reversal in prevailing wind conditions c. AD 1100–1300, turning the direct route from central East Polynesia to New Zealand from upwind to downwind, was instrumental in facilitating Māori colonisation.

Current research aims to specify the existence or otherwise of technical elements critical to the voyaging debate: whether some remains of Māori hulls came from voyaging canoes (Johns et al. 2014); whether historical observations can resolve competing claims about the types of Māori sails (Anderson 2015); and whether wind-tunnel modelling of sailing performance (Irwin & Flay 2015) validates abilities, or limitations, that have been ascribed to particular sailing rigs.

## Disclosure statement

No potential conflict of interest was reported by the author.

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