The Sea-roads of the Ancestors

How the Māori Peopled the Pacific

Elsdon Best 1925

The Great Paradox of the Pacific

Far across the dark waters of the Great Southern Ocean, within two thousand miles of the coast of South America, lies the lone Polynesian outpost of Easter Island. Away to the north-west, beyond many a far meridian, lies Nukuoro, south of the Carolines. A vast distance of something like seven thousand miles separates the two isles—yet the inhabitants of both speak the Māori tongue. In the southern extremity of New Zealand, about 48° south latitude, and at Kauai in the Hawaiian Group, about 22° north latitude, early voyagers found peoples speaking dialects of that same tongue. Eastward to the Marquesas and westward to the Ellice Group, the Māori held sway. Over a great oceanic area of four thousand by five thousand miles in extent—an area larger than Europe—flecked with hundreds of isles, the Māori alone was master.

How did this happen? How came one people, ignorant of metals, possessing only stone tools and fibre lashings, to occupy so vast a realm? How came the Hawaiian to speak of his old-time voyages to Tahiti and relate the deeds of ancestors of the New Zealand Māori? How came the Samoan to describe his exploration of the Paumotus, and the Tongarevan to trace his descent from immigrants from New Zealand? Why do Moriori and Hawaiian claim the same gods?

The answer is that all these widely separated peoples are descendants of common ancestors—of the Polynesian Vikings, the Māori voyagers who broke through the hanging sky in times long past, who fretted the heaving breast of Hine-moana with the wake of their swift canoes, and who marked off the sea roads for all time.

The Vessels That Crossed the World

Two forms of vessel enabled these voyages: the double canoe and the single canoe with outrigger. Both types were employed by voyagers to New Zealand, the latter being probably the most favoured.

The double canoe needed no outrigger—the second hull took its place. Early European voyagers found them throughout Polynesia. In 1774, at Tahiti, the naturalist Forster recorded 159 large double canoes, from 50 to 90 feet in length, ranged in order off shore. These were war-canoes, with large platforms and fighting-stages. In addition, there were seventy smaller double canoes, each with a roof or cabin at the stern. The smallest district of Tahiti at that time possessed forty of the larger vessels. These were not toys. They were the battleships of a seaborne people.

The double canoe, however, had a weakness. The two hulls were connected by cross-spars, with one to two and a half feet of space between them. Should those lashings give way in rough weather, disaster followed. As the Māori tradition of the voyage of Nuku records, when Nuku pursued his enemy Manaia to New Zealand, he came in three vessels: one single canoe and two double canoes. After the sea fight, when Nuku prepared to return to Polynesia, he dismantled his two double canoes and sailed them back as single vessels with outriggers. He did this to make the return passage faster and lighter. That is the voice of practical seamen, not legend-spinners.

The outrigger canoe was the other great design. A single dugout hull, shallow and swift, was stabilised by a float, *korewa,* of very light timber, connected to the hull by curved spars, *hokai*. This vessel could sail remarkably close to the wind. Morrell, a Pacific voyager of the early nineteenth century, stated that the outrigger canoes of the Carolines sailed eight miles an hour within four points (45°) off the wind,

and that in running large he reckoned they would sail twelve miles an hour (20 kph) when the wind is 120° or more). Dampier, who tested these craft himself, gave even more astonishing estimates. At seven miles an hour, a voyage from Tahiti to New Zealand would take eleven days; from Rarotonga, nine days.

The Anatomy of a Voyaging Canoe

Let us take one canoe as our example —*Takitumu*, which arrived in New Zealand from Tahiti about five hundred years ago, a century before Columbus felt his way across the Western Ocean. The traditions preserved by the East Coast and South Island tribes give us extraordinary detail.

The hull was dug from a single tree, then lengthened by adding *haumi*—carved pieces lashed to each end. Four side-boards, or strakes, were lashed to each side of the shallow dugout trough, carvel fashion—edge to edge, not overlapping. The lashings passed through holes bored near the edges of the planks and enclosed wooden battens that covered the joints. (The Tongans and Samoans, however, borrowed a Fijian method where lashings passed through cants hewn on the inside edges, so no cords appeared on the outside—a more elegant, hydrodynamic finish.)

The outrigger float was attached, as were the masts, stanchions, cross-pieces, and battens for the awning. For *Takitumu* was not an open boat. Stanchions *tokotu* were lashed upright along the sides; curved rods, *whiti-tu* arched across the vessel; battens (*kaho*) were lashed horizontally; and then the *huripoki*—a cover or awning of mats made from bark cloth (*tuwhara*)—was stretched over this framework, hauled taut, and lashed down along the sides. In a storm, additional splashboards (*taupa karekare wai*) were secured along the sides. The voyager did not ride naked to the sea. He built himself a moving shelter.

Every part of *Takitumu* had a name. Each of the twenty-six thwarts had its own name. The outrigger timbers, anchors, cables, steer-oars, masts, sails, ropes, bailers—all had proper names. This was not superstition. This was a memory system. By naming every piece, the navigator could call out orders with absolute precision, and the crew—who knew every name—could respond instantly. In the chaos of a storm, that meant survival.

How They Sailed: Navigation Without Instruments

The Māori voyager had no compass, no sextant, no chronometer. He had something better: generations of accumulated knowledge, passed down in chants and oral traditions, and a deep intimacy with the behaviour of the sea and sky.

He navigated by the stars. Different stars marked the routes to different islands. The rising and setting points of particular stars formed a sidereal compass—a celestial path laid across the dome of night. He also watched the sun by day, the moon and its phases, and the planets when visible. He knew that when certain stars stood at a certain height above the horizon, he was on the correct latitude.

He read the swells. Ocean swells, generated by persistent winds thousands of miles away, roll across the Pacific in predictable patterns. An experienced amotawa (sea expert) could feel the direction of the main swell under his canoe, even on a calm day. When that swell intersected with a secondary swell reflected from a distant island, he could sense the change. Some navigators could lie down in the hull and, by feeling the motion of the canoe, determine which swells were dominant and from what direction they came.

He watched the clouds. A fixed patch of white cloud on the horizon often meant an island —the result of moist trade winds rising over warm land and condensing. A greenish reflection on the underside of clouds meant shallow lagoon water. Frigate birds, which roost on land at night but fly far out to sea by day, were living compasses: they flew outward in the morning and returned in the evening.

Their direction of flight at dawn pointed toward land. He watched the sea itself. Floating debris—leaves, branches, pumice from volcanic eruptions—drifted from specific islands. A change in the colour or temperature of the water, the appearance of certain fish species that feed near reefs, the presence of land birds far from shore—all were signs. This was not guesswork. It was science, encoded in oral tradition and tested over centuries.

Drift Voyages: The Accidental Discovery

Not all voyages were planned. Many of the most important discoveries came from drift—canoes caught in storms and carried far beyond sight of land. The first peopling of New Zealand, according to tradition, came from a drift voyage. A people called the Maruiwi arrived in three canoes— *Kahu-tara, Tai-koria,* and *Okoki*—driven from their homeland by a westerly wind. They reached the Taranaki coast and settled. When the voyager Toi arrived centuries later, he found them already occupying much of the North Island.

The most famous drift story concerns Toi himself. His grandson Whatonga had been caught in a storm during a canoe race and blown out to sea. Toi, an old chief, set off in search of him, sailing westward. He visited Samoa, then the islands as far south as Rarotonga, still without success. Then he made a bold decision: he would sail across the Southern Ocean to the great land discovered by Kupe in past times—Aotearoa, New Zealand. His final words to the folk of Rarotonga are recorded: "*I go to seek my child in strange lands, in the moist land discovered by Kupe, and I will greet the land-head at Aotearoa or be engulfed in the stomach of Hine-moana."*

Toi missed New Zealand on his first attempt and discovered the Chatham Islands instead. He eventually reached New Zealand and settled at Whakatane. Meanwhile, Whatonga had returned home, found Toi gone, fitted out the famous vessel *Kura-hau-po*, and sailed in search of his grandfather. He followed Toi's route down to Rarotonga, heard of his voyage to Aotearoa, and crossed the Southern Ocean after him. The two were reunited at Whakatane, and there they settled—two generations of Vikings, never again to see the palm-clad isles of the sunny north.

European records confirm that drift voyages were common. In 1696, two canoes containing thirty persons of both sexes drifted nine hundred miles to the Philippines. In 1721, two canoes reached Guam in the Ladrones after a twenty-day drift. In 1817, Kotzebue found on one of the Radack Chain a native of the Carolines, one of a party that had made a fifteen-hundred-mile drift due east. In 1832, the missionary William Williams found at Manua in Samoa a native of Tubuai in the Austral Group—three months adrift, most of his crew dead. In 1844, a drift voyage from Chain Island, east of Tahiti, carried three natives and one white man all the way west to Manua; only the white man survived.

Cook himself, on his third voyage, found at Atiu some castaways from Tahiti who had been driven there while trying to reach Raiatea. Of this incident he remarked, *"It will serve to explain, better than a thousand conjectures … how the islands of the South Seas may have been first peopled."*

Planned Voyages: Deliberate Colonisation

But drift alone does not explain the pattern. Polynesians also made planned, two-way voyages over immense distances. They had known starting-places for each route and stopping-places at intermediate islands. Voyagers from Tahiti to New Zealand first made the run to Rarotonga, left there in December, the month "*Akaaka-nui*," for the run south-west, and called at Sunday Island, *Rangi-tahua* if needed.

The return voyage was made in June. An old native of the Nga Rauru Tribe stated that Whangarei and Whangateau were starting-places for canoes leaving New Zealand for Rarotonga.

A voyage made by Uenga of Samoa about the twelfth century extended to Tonga, Tongareva, Rimatara, the Austral Group, Tahiti, and the Paumotus—a jaunt of over three thousand five hundred miles. Tangihia, a voyager of the thirteenth century, made an even longer one.Starting from Samoa, he visited Niue, Keppel Island, the Marquesas, Tahiti, Rapa, the Austral and Cook Groups, Rimatara, and other isles. Whiro took a party of settlers to Rarotonga, then sailed to the Marquesas, Tahiti, Rapa, and beyond.

In 1616, Le Maire and Schouten encountered a double canoe under sail west of the Paumotu Group, out of sight of land, with twenty-five men, women, and children on board. The historian of that voyage remarked on the enterprise of natives who, *"without compass, or any of the aids from science which enable the navigators of other countries to guide themselves with safety, ventured beyond the sight of land."*

The Tongans were particularly daring. They made frequent voyages to Fiji—a three-day sail from Tongatapu—and also reached the New Hebrides and New Caledonia. In 1793, an expedition searching for La Pérouse saw a canoe off the coast of New Caledonia containing eight Polynesians—seven men and one woman—who spoke the Tongan dialect. They had come from Uvea in the Loyalty Group, a day's sail distant.

What They Carried

These were not mere exploration vessels. They were colonising ships. They carried not only stocks of food and water—dried fish, preserved shellfish, coconuts, water in gourds and bamboo vessels—but also live animals and plants. Hogs and fowls were transported across the Pacific. So were yams, taro, sweet potatoes, the gourd, breadfruit, bananas, and coconuts. The orange was advancing eastward when Europeans arrived. The sweet potato, of South American origin, reached Polynesia centuries before Columbus—a fact that suggests contact between Polynesians and the Americas.

The animals that reached New Zealand were the dog and the rat. The food plants were the sweet potato, taro, gourd, and possibly the yam. The *aute* tree (paper mulberry), used for bark cloth, was also introduced. Every living thing that came to these islands came in the hull of a canoe.

The Art of the Landing

After weeks at sea, the voyager's greatest danger was not the open ocean but the surf. The reef-lined coasts of Polynesia and New Zealand presented a lethal barrier. A single mistake in the breaking waves meant the canoe swamped, the cargo lost, and the crew drowned.

The *amotawa*, the sea expert, took command. He knew that in the *tai maranga*—the leaping surge—eleven curling dangerous combers (*ngaru wharau*) were followed by one smooth, rounded, crestless billow (*mutu moana*). That was the only wave on which a canoe could ride safely to land. He waited for that wave.

As it reached the canoe and lifted her, he gave the sharp order: *"Kia aronui te hoe!"* Every paddle was held stationary in the water, blade broadside to the sea run. This held the canoe on the swell of the wave. The prow needed to project slightly in front of the wave-crest. If the canoe began to slip back, the command *"Kia korewa te hoe!"* turned all paddles edgewise, and the canoe forged ahead again.

As the wave grounded and began to dissolve, the cry came: *"Kumea te hoe!*" The long bow oars were taken in. Every paddle was plied with fierce energy. The canoe shot up the beach. As one man, all hands dropped their paddles, leaped out, and ran her up beyond the reach of the next wave. The Māori voyager had made his landing, upholding the saying of yore: "*He ihu waka, he ihu whenua*" —the prow of the canoe touches the nose of the land.

The Last Voyages

The Māori did not stop voyaging when they reached New Zealand. As late as the time of Toi—thirty generations ago, about 750 years before the present—Polynesians had not yet permanently settled these islands. The great migrations continued. Later, voyages became rarer, but they did not cease entirely. Ten generations ago, the last known voyage from New Zealand to Polynesia took place.

In 1835, when Ngati-Awa seized the barque Rodney at Port Nicholson to raid and settle the Chatham Islands, they wrote the final chapter in the long history of the Māori buccaneers. And it is on record that these daring Vikings had arranged with an American whaler to transport them to Samoa—a scheme foiled only by the arrival and plunder of another ship, the Jean Bart.

What It Means

The Māori voyager left the so-called adventurous peoples of other cultures to their sailing journeys close to the shoreline. He passed through the dark-skinned folk of Melanesia, despising them not for their colour but for their lack of daring. He roamed far and wide over the vast Pacific Ocean and carried his speech from Nukuoro to the Chathams, from Easter Island to Madagascar. He feared not the dangers of the deep, known or unknown. He harnessed his gods to the task of assisting him. He traced out the *ara moana*—the sea roads—over two great oceans for western folk to treasure and western keels to furrow.

He did all this without metals, without compasses, without maps, without writing. He did it with a dugout log, a stone adze, fibre lashings, and the knowledge encoded in his genes and his chants. When we say that he was a navigator, we mean something more than that he found his way from one island to another. We mean that he looked at the stars and saw roads. He felt the swells and heard the voice of distant land. He watched the birds and understood their language.

He stepped softly on the flanks of new islands and placated the demons thereof. He conducted solemn ritual to introduce his gods. He forgot not those who had protected, guided, and succoured him. For he was ever in sympathy with his surroundings, and ever he vivified them. He endowed them with strange powers. He loved to personify the elements, the forces of nature, and inanimate objects—to feel that he was in unison with them, that all possessed life in common, that all were the offspring of the first all-embracing parents: the Sky Father and the Earth Mother.

Impelled by Tawhiri-matea (god of winds) and borne by Tane (god of forests) across the broad, heaving breast of Hine-moana; guided by Hine-korako (the moon) and urged forward by Huru-moana (the ocean current); succoured in time of stress by Te Ihorangi (the rain) and Tangaroa (god of the sea)—the voyager eluded iron-ribbed Rakahore (the rocky coast) and was received by Hine-tuakirikiri (the fair landing beach). Rolling down the rugged flanks of Hine-tu-maunga (the mountain) came Para-whenua-mea (the food of the land) to restore his waning energies, while Hine-pukohu-rangi (the mist) cast her white mantle over him.

Even so does the Māori voyager return to the Primal Parent—the Parent who brought man forth to the World of Life and who takes him again to her sheltering breast when, weary and wayworn, he returns from his journey. The Parent to whom all voyagers and all men return at last: the first Mother Parent, Papa-tuanuku, Papa-matua-te-kore—the Parent and the Parentless. The old, old Earth Mother. 

Thousands of years ago, the ancestors of Māori journeyed out of South-East Asia and into the Pacific. They sailed in waka, and were some of the world's greatest boat builders, navigators and mariners.

Ancestral seafarers

These ancestors were among the greatest ever of boat builders, navigators and mariners. Over the course of several thousand years, long before they came to New Zealand, Māori ancestors swept eastwards out of South-East Asia into Micronesia, Melanesia, Polynesia, and westwards across the Indian Ocean.

Early sea craft

The earliest crossings were probably made on rafts and dugout canoes. Travel was limited to neighbouring islands that were within clear sight of one another. Rafts could carry several people and heavy loads, but were slow. Dugout canoes were faster, but could carry only a few people. Both were unsuited to longer crossings – high seas washed people off rafts, and dugouts were prone to capsizing.

Outrigger canoes

Over time, an outrigger was added to dugouts to increase stability. Decks gave stability between the hull and the outrigger. Sails were also added for greater speed, and steering paddles controlled direction.

The Micronesian baurua and proa were the most sophisticated outrigger canoes. They were always sailed with the outrigger facing the oncoming wind, so that it did not drag and slow the vessel. Hulls had a distinctive asymmetric shape. The outside of the hull was flat, which stopped the wind pushing the canoe sideways; the inside was rounded to keep the water flowing between the hull and the outrigger. Carefully counter-balanced decks maintained overall stability.

The stability and speed of these canoes allowed navigators to sail across long stretches of open sea between relatively distant islands. European explorers, including James Cook and Charles Wilkes, observed craft like these moving much faster than their own ships: some were estimated to be travelling at up to 40 kph.

Double-hulled canoes

Polynesians developed the double-hulled canoe (sometimes called a twin-hulled canoe or catamaran) to sail in the rougher waters of the open Pacific. Some of these canoes were very large – one Fijian ndrua was 36 metres long (Cook's Endeavour was 33 metres). European explorers and missionaries reported ndrua carrying up to 250 people.

Ndrua had two hulls, one slightly longer than the other. The longer main hull could carry heavy loads; the shorter hull allowed manoeuvrability, functioning in much the same way as an outrigger. The Tongan adaptation of ndrua was called kalia, and the Samoan equivalent was ʻalia. These vessels were best suited to ferrying large numbers of people between nearby islands.

Double-hulled canoes used over long distances were generally shorter (about 20 metres). Such vessels were capable of travelling between 150 and 250 km a day. Tahitians used the pahi and tipairua: on one occasion Cook saw six of these canoes, each 23 metres in length. The Rarotongan double-hull was called vaka-katea.

Hawaiian double-hulls were waʻa-kaulua, usually about 20 metres long; one, probably used for inter-island sailing, measured 33 metres and reputedly carried over 100 people.

Hulls, sails and steering paddles

Canoes could have two main hull shapes: the fast V-shape, and the more manoeuvrable U-shape. All double-hulled canoes sat high in the water to minimise drag, and were therefore capable of great speeds. The record-breaking catamaran yachts of Sir Peter Blake (Steinlager 1) and Grant Dalton (Club Med) were based on Polynesian designs.

Several types of sail were used on traditional craft. Forming a V-shape, sails caught more wind on masts which, made from natural materials, were much shorter than those of modern yachts.

Steering paddles were long, some over 6 metres. Length served two purposes: steering the canoe, and preventing the vessel being pushed sideways by the wind and sea swell. When plunged deep into the water, paddles had much the same function as the keel on a modern yacht.

Preparing to sail

The most manageable long-distance canoes were about 20 metres long, with a crew of between five and 15. Food carried on board might include bananas, taro, kūmara (sweet potato), chickens, pigs, fish, breadfruit, yams and gourds. Coconuts served as both food and drink. Water was stored in gourds, and voyagers also caught rainwater in the sails. West Polynesian traditions speak of thirsty voyagers draining the blood of large fish into coconut shells. This may have been especially tasty.

Voyage routes were preserved in memory, often in song and story. They were mapped using notable landscape features such as mountains, outcrops of rock and prominent trees, lined up with known star paths. The term for this method of navigation is back-sighting. Navigators would set sail at dusk, lining up their canoe with prominent landmarks behind them, and follow the relevant star path as the sun set.

Navigation at sea

The principles of traditional Polynesian navigation were simple, but its practice was refined over generations of experience. The greatest skill of the old navigators was their ability to read the night sky. The rising and setting points of the brightest and most distinctive stars and planets were gauged with the help of sophisticated star compasses, and then memorised. Compasses were also used to chart the winds.

Navigators steered their canoes toward a star on the horizon. When that star rose too high in the sky or set beneath the horizon, another would be chosen, and so on through the night. Seven to 12 stars were sufficient for one night's navigation, and the moon and bright planets such as Kōpō (Venus) and Pareārau (Jupiter) were also useful. At daybreak, navigators noted the position of the canoe in relation to the rising sun. As the sun got higher in the sky, they looked to where it would set in the evening.

When skies were too overcast for navigators to use the sun, the moon, planets or stars, their course could be gauged according to ocean swells. In the Pacific, prevailing north- and south-easterly trade winds pushed up swells that remained constant for long periods.

Navigators kept their canoes at the same angle to these swells. Sudden changes in canoe motion indicated that it had changed course. To avoid veering off course, a rope was trailed behind the canoe – if a wave suddenly jarred the vessel, the rope remained true to the original line of travel. Some navigators also lined up their canoe with wind direction, using pennants tied to the mast and rigging as guides.

Locating land

a. Birds

The pathways of migratory birds helped in the discovery of new lands. There were certainly people who were familiar with patterns of bird migration. For example, the direction of the West Polynesian pigeon's annual migration was followed by navigators between Tonga and Samoa. Ancestors of the Māori may have speculated that there was land in the south-west Pacific, as the long-tailed cuckoo and shining cuckoo fly south from the islands of Polynesia and Melanesia respectively every spring and return in autumn.

An island was signalled by the birds that fly out from it to sea at sunrise to fish, then return to their nests at sunset. Frigate birds fly up to 100 km from land, gannets and petrels 70 km, and terns up to 50 km.

b. Whales

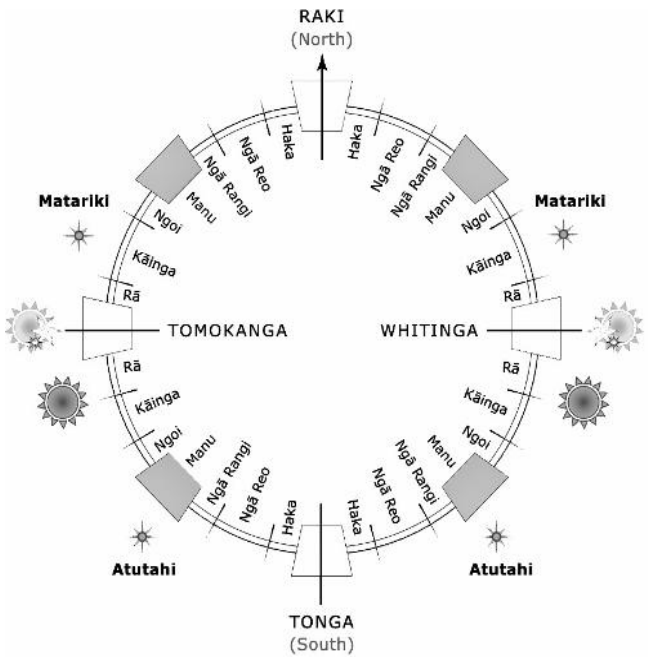
At the beginning of each winter the humpback and other whale species travel in multiple family groups, or pods, as they migrate north from Antarctica to the Pacific. Some pass along the west coast of New Zealand into the waters of Vanuatu and New Caledonia. Some travel along both sides of the country toward Tonga and Samoa, while others pass the east coast to Rarotonga and Tahiti. In November and December, the whales return south to Antarctica.

Māori ancestors may have believed that by following whales they would be led to land, as whales typically calve in the calmer waters off atolls, islands or larger land masses. Because they are slow, whales would have been easy to follow. Their rate of travel, three to five knots, is well within the cruising speed of a double-hulled canoe. According to Māori oral traditions, whales guided canoes to New Zealand, and the ancestor Paikea is even said to have arrived "on" one.

The season when whales migrate south coincides with the appearance of the stars and planets most useful for navigating to New Zealand – the setting sun, Kōpū (Venus), Te Waka o Tamarereti (Scorpio) and Māhutonga (the Southern Cross).

c. Stars

Zenith stars that at their highest point shine directly over known islands were useful for locating land. They were used by Tongan, Tahitian and Tikopian navigators. Arcturus is the zenith star for Hawaii, and Sirius for both Ra'iatea in Tahiti and Vanua Levu in Fiji. Navigators positioned their canoes immediately beneath their target star, knowing that this would place them within 80 km of the destination island.



Measuring the height of meridian stars (stars on the same longitude) above the horizon using fingers and hands was a useful method for finding land. Polynesian sailors may have been guided by meridian stars such as the Southern Cross.

For instance, viewed from Hawaii the bottom of the upright Southern Cross is four fingers above the horizon; sailing south it increases to one full hand span at the equator, and two hand spans approaching the latitude of Tahiti.

d. Clouds

The shape, movement and colour of clouds were important indicators of land. Convection clouds build up during the day over large islands, becoming higher, thicker, darker and slower moving than clouds over the sea.

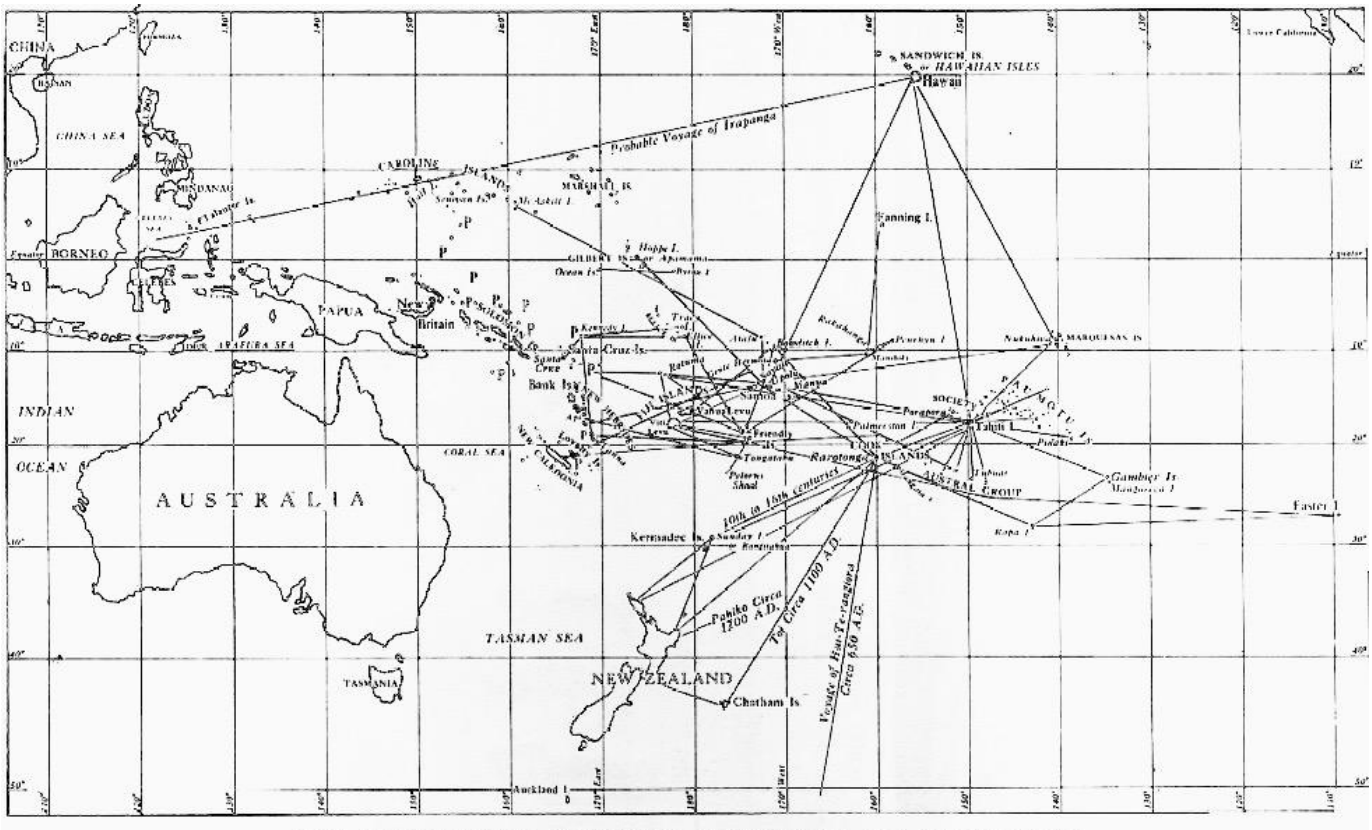
Cloud over high islands such as Tahiti and Hawaii can be seen over 150 km away. The small, characteristically eyebrow-shaped clouds that form over small atolls can be seen up to 50 kilometres away. A reef is indicated by pinkish cloud, while the cloud base over forested islands is dark or green. When a cloud is unusually bright, sunlight is being reflected off atoll lagoons onto the cloud base.

e. Land swell

Experienced navigators used distinctive land-swell patterns, which form when sea swells strike land, to determine the location of land long before it was visible. Land-swell patterns have two distinctive forms. In one, waves take shape when the prevailing swell strikes an island and bounces back on itself. Bounce-back waves can be detected 50 km away from small islands, and up to 300 km away from land masses the size of New Zealand. In the other land-swell form, patterns are created when a swell divides and curls around an island. Navigators can detect the confused wave pattern or shadow of turbulence at some distance.

f. The sea

The sea itself provided useful markers for navigation. Changes in colour, the presence of certain fish species, ocean currents, the 'scent of land' and the appearance of whirlpools were all important signs. Debris such as driftwood and leaves suggested nearby land, and floating rubbish signalled that human settlement was close.



MAP SHOWING SOME RECORDED VOYAGES OF THE POLYNESIANS

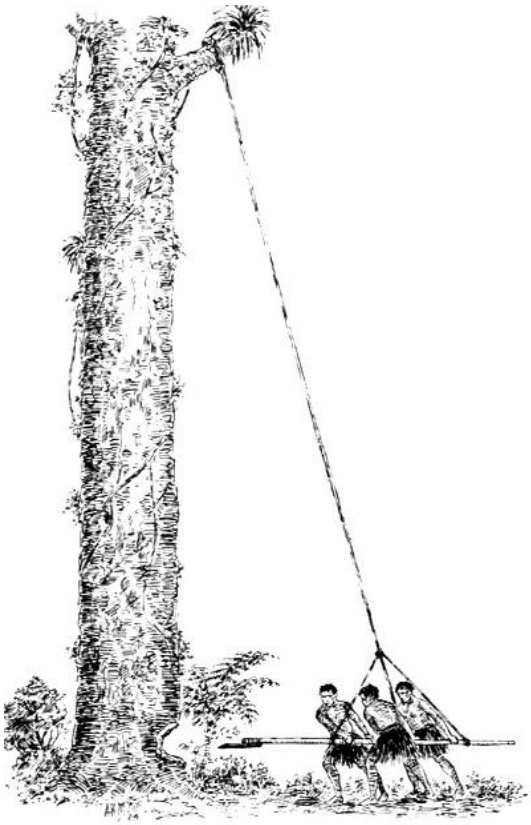


Fig. 17. An East Coast Tree-felling Device.

Just after I finished putting all the above pages together, I discovered 300 pages of pure gold; **THE MAORI CANOE, by Elsdon Best (1925)**. A reprint copy of it can be bought for $120. Or you may be able to get it interloaned. An archived copy is on the internet. I have copied the contents pages for you. If you want pages from it printed for you, ask a librarian or whanau member to go here. (**tinyurl.com/wakamaking**)

INTRODUCTORY REMARKS
The Polynesian canoe. Canoes of New Zealand. Obsolete types. Scarcity of information. Nomenclature. Canoe-structure changed by local conditions. Possible origin of local peculiarities. Principal forms not peculiar to New Zealand. Symbolical terms for canoes. The canoe of Tama-rereti. Ownership of canoes.

Page 8. CLASSIFICATION AND DESCRIPTION OF MAORI CANOES
Three main types of canoes.
(1.) The double canoe. (2) The single canoe with outrigger. (3.) The single canoe with no outrigger.
Subdivision of class (3): (a) The waka taua or war-canoe; (b) the waka tele, or ordinary canoe; (c) the waka tiwai, or river- canoe.
The double canoe seen by early voyagers. Tasman's remarks. Banks's remarks. Two forms of double canoe. Shortland's remarks. Missionary notes. Vessels of immigrants from Polynesia. Origin and distribution of double canoes. Late use of double canoe. The outrigger canoe. Seen by early voyagers. Origin and distribution of outrigger. Outrigger employed in India prior to Christian era. Disuse of outrigger in New Zealand preceded that of double canoe. The double outrigger. Maori tradition of canoes. Distribution of canoes. Use of same abandoned in several regions. The single canoe lacking outrigger. Native names for canoes. Mohi Turei's remarks. Description of war-canoes by early voyagers.

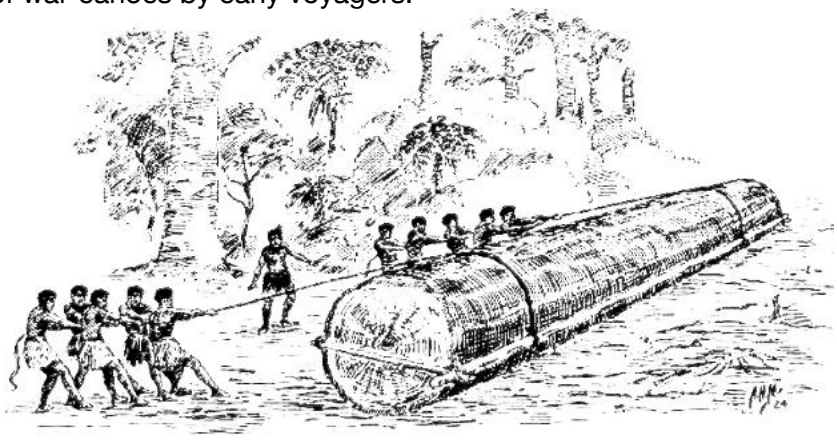


Fig. 23.—The Takamiiti Log-turning Device.

Page 36. THE CONSTRUCTION OF THE WAKA TAUA, FROM TREE-STUMP TO LAUNCHING
Evolution of built-up vessels. Tree-felling. Timbers used. Suitable trees reserved. Special trees named. Superstitions and ritual pertaining to tree-felling. Curious device for tree-felling. Fire employed in tree-felling. The dubbing process. Log-rolling apparatus. Tap of work and workers. Hauling canoe from forest. Hauling-songs. The waka hauni. Fitting up canoe. Joining hull sections. The top-strakes. Different modes of lashing top-strakes in Polynesia. Thwarts. Splitting-wedges. The tawihu, or carved prow. The taurapa, or carved stern-piece. Floor-grating. Canoe-painting. Launching of canoe. Ritual and human sacrifice. Large canoes.

Page 120. FISHING AND RIVER CANOES; CANOES OF CHATHAM ISLANDS; CEREMONIAL OBSERVATIONS PERTAINING TO CANOES
The waka tele, or fishing-canoe. Marked by plain figurehead and lack of adornment. Descriptions of ordinary canoes. The wakd tiwai, or river-canoe. The Henley canoe, an abnormal form. Mending and patching canoes. Canoe fleets. Arrival of European vessels. Rafts and floats. Canoes of Chatham Islands.Ceremonial matters pertaining to canoes.The mauri. Canoes under tapu.

Page 158. METHODS OF PROPULSION; ANCHORS

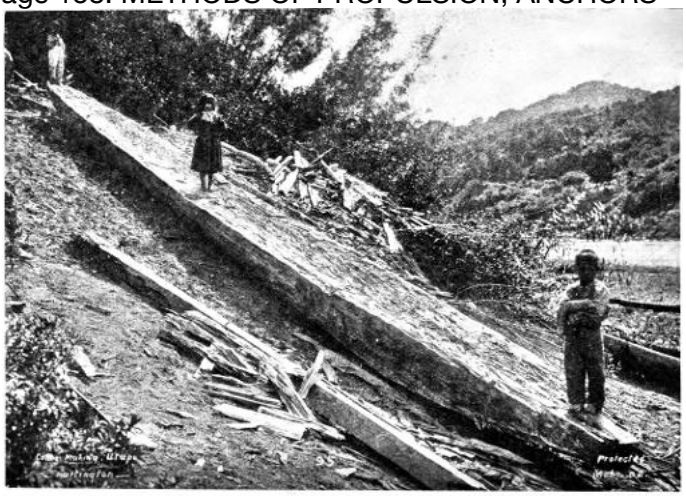


Fig. 25.—A Canoe in the Making.
Steel-tool work. [Partington, photo.

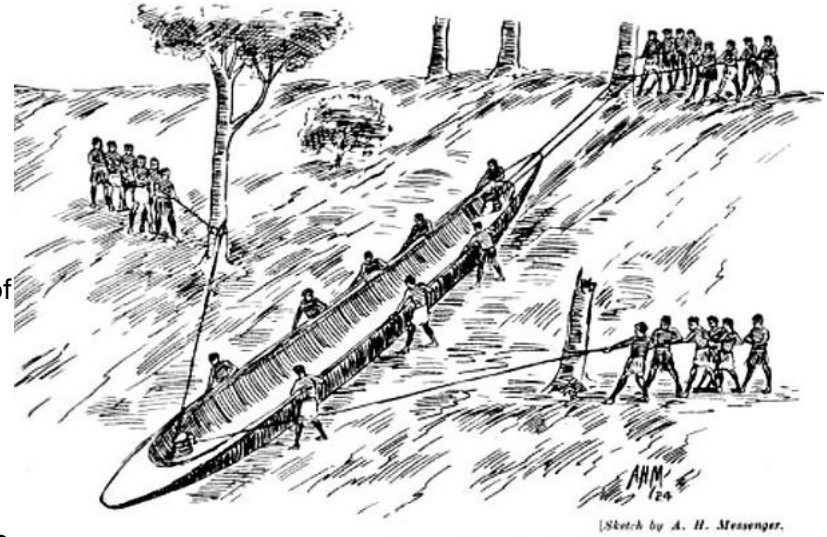
Paddles and their use. Materials used. Steering-paddles. Steering. Fuglemen and songs. Painted paddles. Carved paddles. Modes of paddling. Women as paddlers. Certain canoes beached stern foremost. Bailers and bailing. Sails and sailing. Materials and form. Process of manufacture. Manipulation of sails. Modes of sailing. The lateen sail, or ra kaupapara. The upright sail, or ra kautu. Maori canoe-sail in British Museum. Speed of canoes. Rates of sailing and paddling. Poling or punting. Anchors and their uses. Materials and forms of anchors. Method of raising sea-anchors. Anchors named.

Page 200. CANOES OF THE PACIFIC AREA

Prototypes of Maori vessels. Distribution of different forms. Australian canoes. Double outrigger. Possible evolution of ordinary Maori canoe from outrigger and type with balance-platforms. Superiority of Polynesians as navigators. Polynesian canoes. Canoes of CookGroup. The pahi. Double canoes. Canoes of Mangaia. Curious steering-device. Canoes of Niue. Canoes of Manihiki. Canoes of Austral Isles. Canoes of Tongareva. Canoes of Ellice Group. Canoes of Easter Island. Canoes of Society Group.Canoes of Paumotu Group. Canoes of Marquesas Group. Canoes of Hawaiian Isles. Canoes of Tonga Group.Canoes of Samoan Isles. Melanesian canoes. Canoes of Fiji. Canoes of New Hebrides. Canoes of Santa Cruz Group. Canoes of New Caledonia. Canoes of Solomon Isles. Canoes of New Ireland. Canoes of Admiralty Isles. Micronesian canoes. Canoes of Caroline Group. Canoes of Ladrones. Outriggers of Ceylon and India. Deep-sea vessels mentioned in Maori tradition. Management of same. The double outrigger. Compass-points and wind-names.

Page 272. THE PEOPLING OF NEW ZEALAND

Polynesian voyagers. Oral traditions. Discovery of New Zealand by Polynesians. Voyage of Kupe and Ngahue. A lone land. First settling of New Zealand. Coming of the Mouriuri, a people of unknown origin. Second peopling of New Zealand. Coming of the Maori.The voyage of Toi. The coming of Kura-hau-po. Voyage of Manaia and Nuku from eastern Polvnesia to New Zealand. Coming of the fleet. Vessels of the immigrants. Arawa canoe. The Matatua. Aotea. Takitumu. Horouta. List of immigrant canoes. Voyages made from New Zealand to Polynesia.



[Sketch by A. H. Messenger.

Fig. 30.—Method of lowering a Canoe down a Steep Hill.

Page 292. NAMES OF PARTS OF MAORI CANOES

(There are about 300 names here)

Dear readers,
I do hope all this encourages some of you make an adze (the steel blade out of a carpenter's wood-plane shown on Page 18 works) and a drill, and practice the skills your tupuna used. Or learn and use the chants that made your tupuna to become one with Tane's trees, so that you become one with them too.
And I hope you have enjoyed your voyage through these pages as much as I have enjoyed making them.
And my best wishes for you in finding peaceful shores as you continue on your voyage through life.
Kia kaha
John Archer

THE END