

DISCOVERERS of the PACIFIC

Produced by the Cartographic Division
National Geographic Society
MELVIN M. PAYNE, PRESIDENT
NATIONAL GEOGRAPHIC MAGAZINE

MEVILLE BELL GROSVENOR, EDITOR-IN-CHIEF
GILBERT M. GROSVENOR, EDITOR
WILLIAM T. FEELE, CHIEF CARTOGRAPHER
DAVID W. COOK, ASSOCIATE CHIEF CARTOGRAPHER
WASHINGTON, DECEMBER 1974

Design and artwork: Herb Kawainui Kane
Principal Illustrator: Kenneth P. Emery, Jr., D.D.
Senior Anthropologist: Bishop Museum, Honolulu
Text: Herb Kawainui Kane, Michael E. Long
Research: Judith Brown

THE SEA PEOPLE

Nightfall in the Marshall Islands. Miles from land, a solitary outrigger canoe tosses in the rolling swells. In the bilge of the canoe, a man lies on his back, silent, his every sense attuned to the slap of wave upon hull, to the rhythm of the dance between his vessel and the sea. Incredibly enough, he is fixing his position—at night, in the open ocean. From years of training and experience, he knows that ocean swells, rebounding from islands in his archipelago, form patterns that vary from place to place. By interpreting his canoe's response to the swells, he knows his location.

He is a navigator. A navigator without compass, chart, or sextant, but a navigator nonetheless, and one of the last remnants of a determined breed of voyagers—the Polynesians, the Micronesians, and to some extent, the Melanesians—who discovered every habitable island of the vast mid-Pacific from New Guinea to lonely Easter. They accomplished all this before Columbus set sail, before Vikings ventured westward.

They voyaged in canoes hand-hewn from trees, lashed with coconut fiber, and rigged with sails of plaited leaves. Rugged, seaworthy, their vessels excited the admiration of European sailors. "They sail the best of any Boats in the World," noted the English buccaney William Dampier of canoes he saw at Guam in 1688. Of the Hawaiian outrigger, the missionary William Ellis observed, "One man will sometimes paddle a single canoe faster than a good boat's crew could row a whale-boat." One of Captain Cook's crewmen paid this tribute to Tongan seamen: "These Canoes run us nearly out of sight... they sail about 3 Miles to our two..."

Where did they come from—these dauntless explorers of the Pacific? The Polynesian languages, plants, and domestic animals—pig, dog, and jungle fowl—suggest an origin in the islands of Southeast Asia. Their immediate ancestors were the Lapita people, ancient voyagers known mainly by the pottery they scattered from New Britain to the cradle of Polynesia, the islands of Tonga and Samoa. Here, from perhaps only a few families, the people we know as Polynesians evolved.

Around the beginning of the Christian Era, they pointed their canoes into the blue infinity eastward, into an area of ocean more than four times as large as the United States, to discover a galaxy of islands whose total land area, excluding New Zealand, is not quite that of New Hampshire.

Were their discoveries planned? Or were they accidental—canoes driven by wind or storm on one-way trips to new landfalls? Scholars fitting together the pieces of the past still debate the question, but the majority theorize that many were voyages of exploration, deliberately planned and skillfully executed.

When the Europeans arrived, the heyday of Polynesian exploration had long since passed; Western accounts of the navigational techniques of the Pacific peoples are fragmentary and inconclusive. Captain Cook observed that they sailed with "the Sun serving them for a compass by day and the Moon and Stars by night."

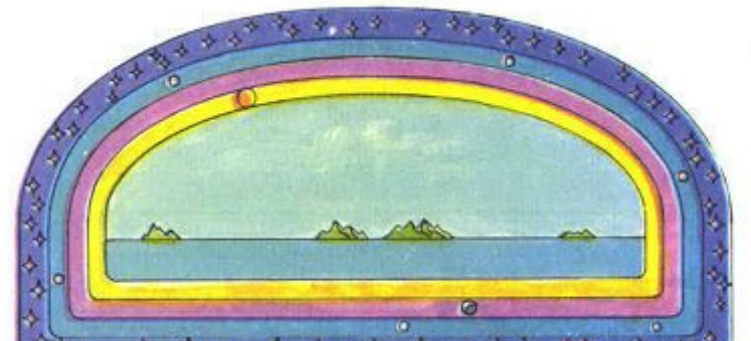
In 1965 Dr. David Lewis, an accomplished navigator who had made three solo crossings of the Atlantic, put theory to the test of sail. Disdaining conventional instruments, using only the signs of the sky and the sea, he sailed from Tahiti to New Zealand, and made his landfall with only 26 miles of error. Later he voyaged with navigators of the western Pacific, absorbing the seagoing lore of men who still roam the open ocean as did their forebears (see the article beginning on page 747 of the December 1974 GEOGRAPHIC).

For the Pacific Islanders of old, the canoe was the lodestone of life. Some voyages were forced—by lost battles, famine, even outraged husbands. Others were for gift-exchange, to be tattooed (*tatau* is a Polynesian word), to gain the status of explorer, or just to relieve boredom. Only in a few remote islands does the ancient urge to go voyaging persist, where trips of several hundred miles are made to reaffirm manhood, or, if anyone should ask, to buy cigarettes.



Helmet and cape of a Hawaiian noble required the feathers of thousands of birds.

Pigeon feathers of iridescent green enliven the helmet of a Tahitian ruling chief.



STEERING BY STARS AND SEA

Unlike the early European navigators, who feared sailing off the edge of the world, Pacific Islanders faced the ocean with confidence. For the Polynesian, god-ancestors ruled an orderly universe. When the sun, moon, and planets kept to their appointed paths, when stars predictably rose and set, when the sea itself was the bosom of his ancestor Tangaroa—what was he to fear?

But there was much for him to respect: the dangers of voyaging of ships and men wrecked upon a reef or foundering amid storm-tossed waves. Nevertheless, the Polynesians saw such misfortunes as arising from faults of their own, such as a helmsman who erred in navigation, or one who failed to observe an obligatory ritual.

Guide the handle of my steering paddle. My paddle floats in the water. The handle heaves high into the sky. The endless receding sky. The endless approaching sky. The sky wherein resides the heavenly force. The air enveloping, the air-carrying force. The sacred force of the sky. This is the sacred path no man has taken. The path between heaven and earth. The path of the hosts of ancestors—the path now of this earthly chief. Be back to Rauiha and Tama-the-shining-down.

—Moon Sea Chant

Blowfish helmet and semi-armor helmet of a Gilbert Islands warrior. Shark's teeth edge his sword.

Boar's tusk pendant and a comb of coconut-wood ribs lashed with human hair adorn a Tongan warrior. He carries an ironwood club.

White tapa turban and a headpiece of pearl shell and ivory armor of a Fiji chief.

Face scarred with tattoos, a Maori chief of New Zealand donned a jade war club.

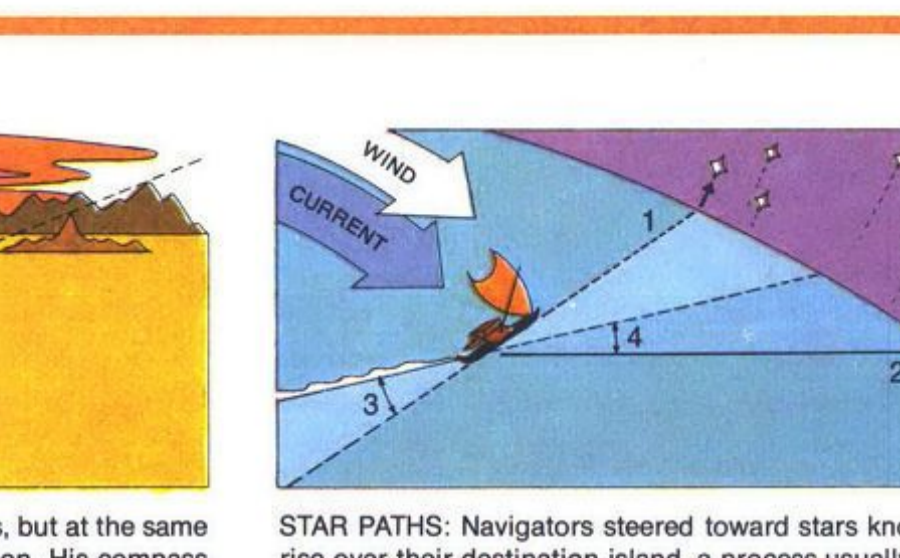
Reveler of the Santa Cruz. Later one of the last of the Polynesian navigators and tutor to Dr. David Lewis, in 1930 this aging and proud man, sensing he would soon become a burden to his family, bade farewell to them and paddled out to sea in a frail canoe, never to return.

We Kauiua. "Well calculated for speed," wrote a 19th-century observer of this sleek Hawaiian canoe. "We have seen the natives... fairly run them under water."

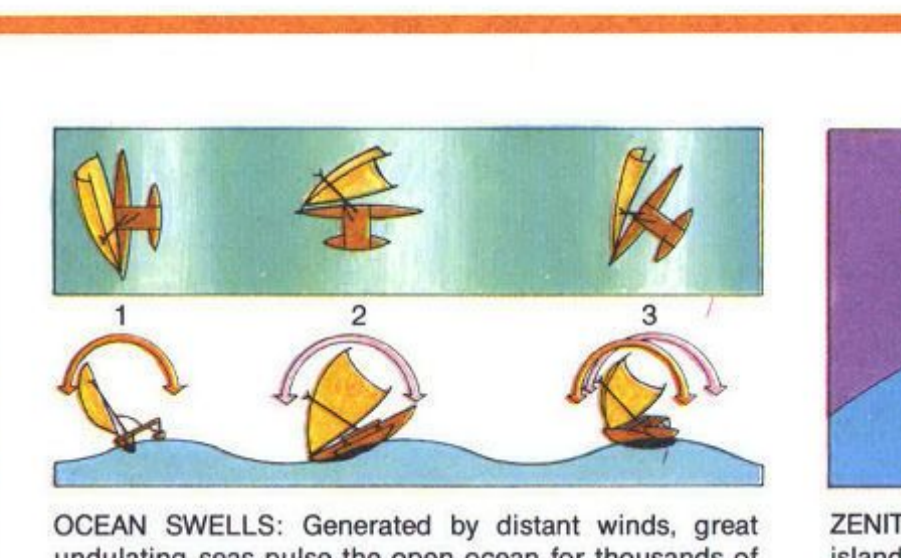
Pahi. Carved this crown the upper bow and stern of this double-hulled voyager of the Society Islands.

Waka Tauara. Canoe craftsmen of Marakahi in the Cook Islands adorned their vessels with rich designs of mother-of-pearl.

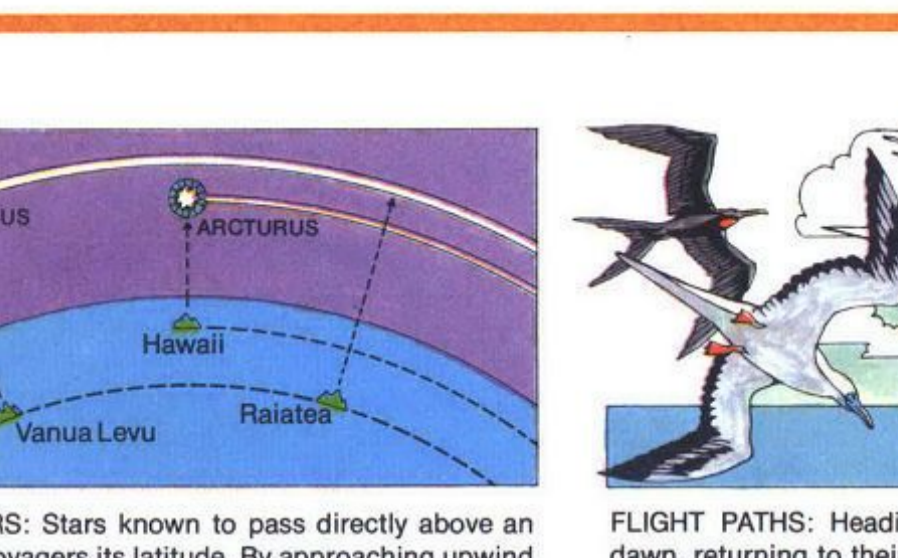
Waka. Dolphinlike bow distinguishes this trading canoe of Pukapuia. It could carry several tons of cargo.



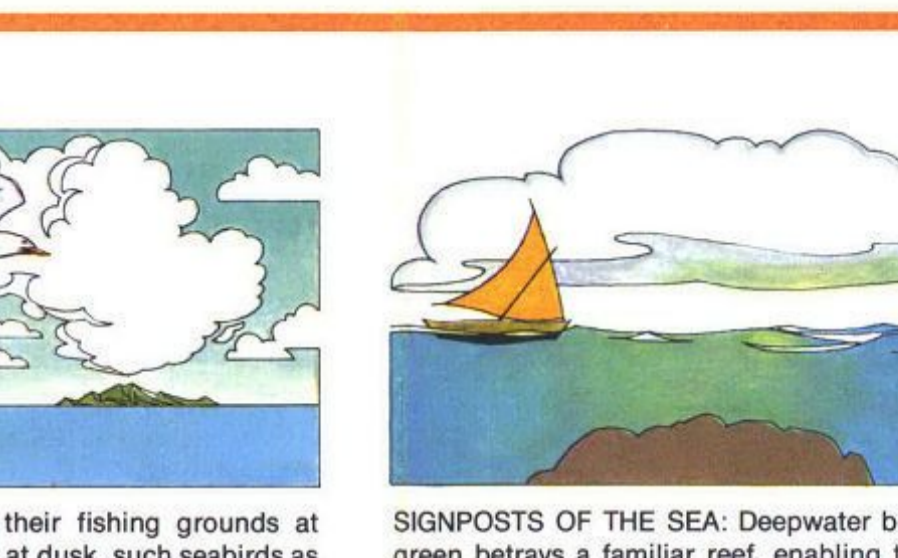
STAR PATHS: Navigators steered toward stars known to rise over their destination island, a process usually complicated by wind and current. Buffeted by waves and yet another signal, a helmsman chooses a star (1) well to the left of his desired course (2). He allows for the wind, which he can gauge by his heavey, or angle his boat makes with its way (3), and for current (4), an angle he must estimate from experience. Such corrections allow him to sail true to his landfall. "I cannot miss my island," says a Tikopian navigator. "It is where I follow the stars."



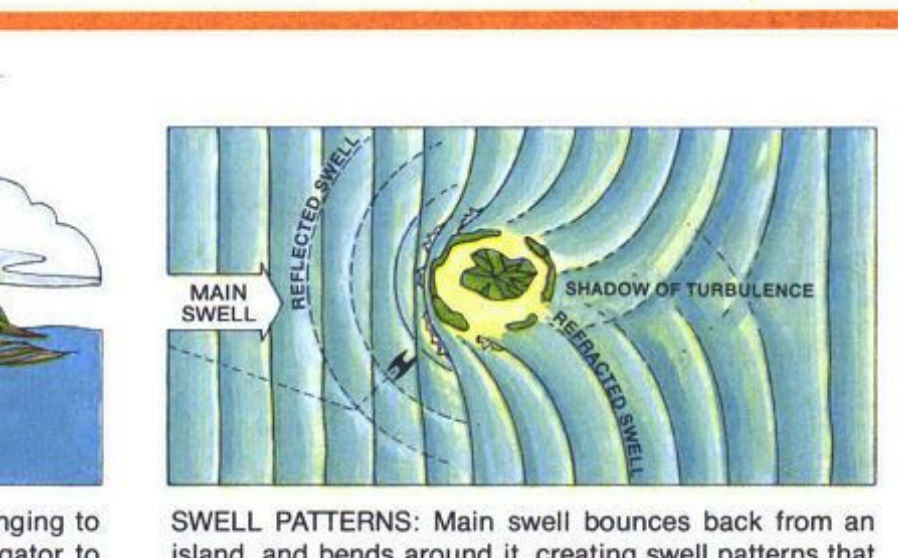
OCEAN SWELLS: Generated by distant winds, great undulating seas pulse the open ocean for thousands of miles, providing the navigator with yet another signal. He can maintain a heading by regulating his degree of roll (1), pitch (2), or combination of the two motions (3).



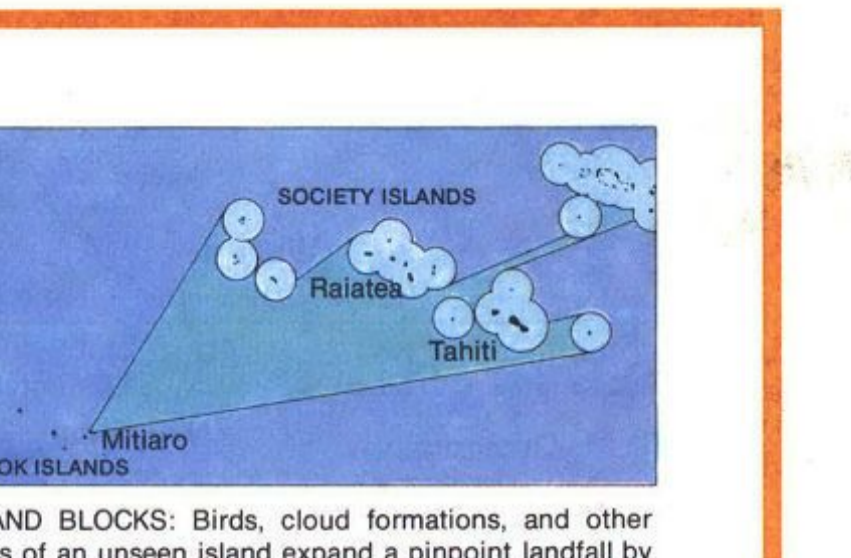
ZENITH STARS: Stars known to pass directly above an island gave voyagers their clue. By approaching upwind of an island until its zenith star was overhead, the navigator could then turn due west and run with the wind to his destination.



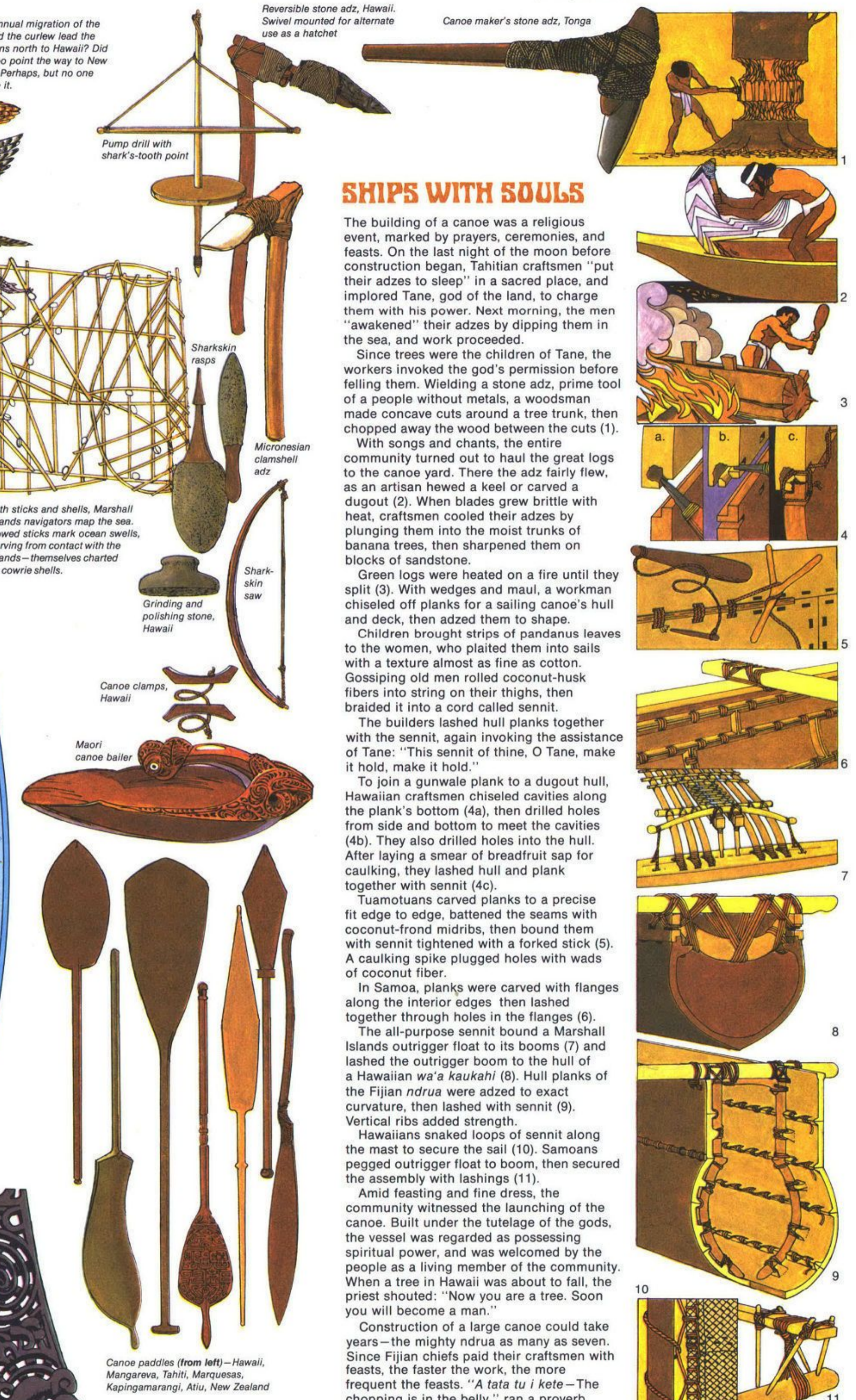
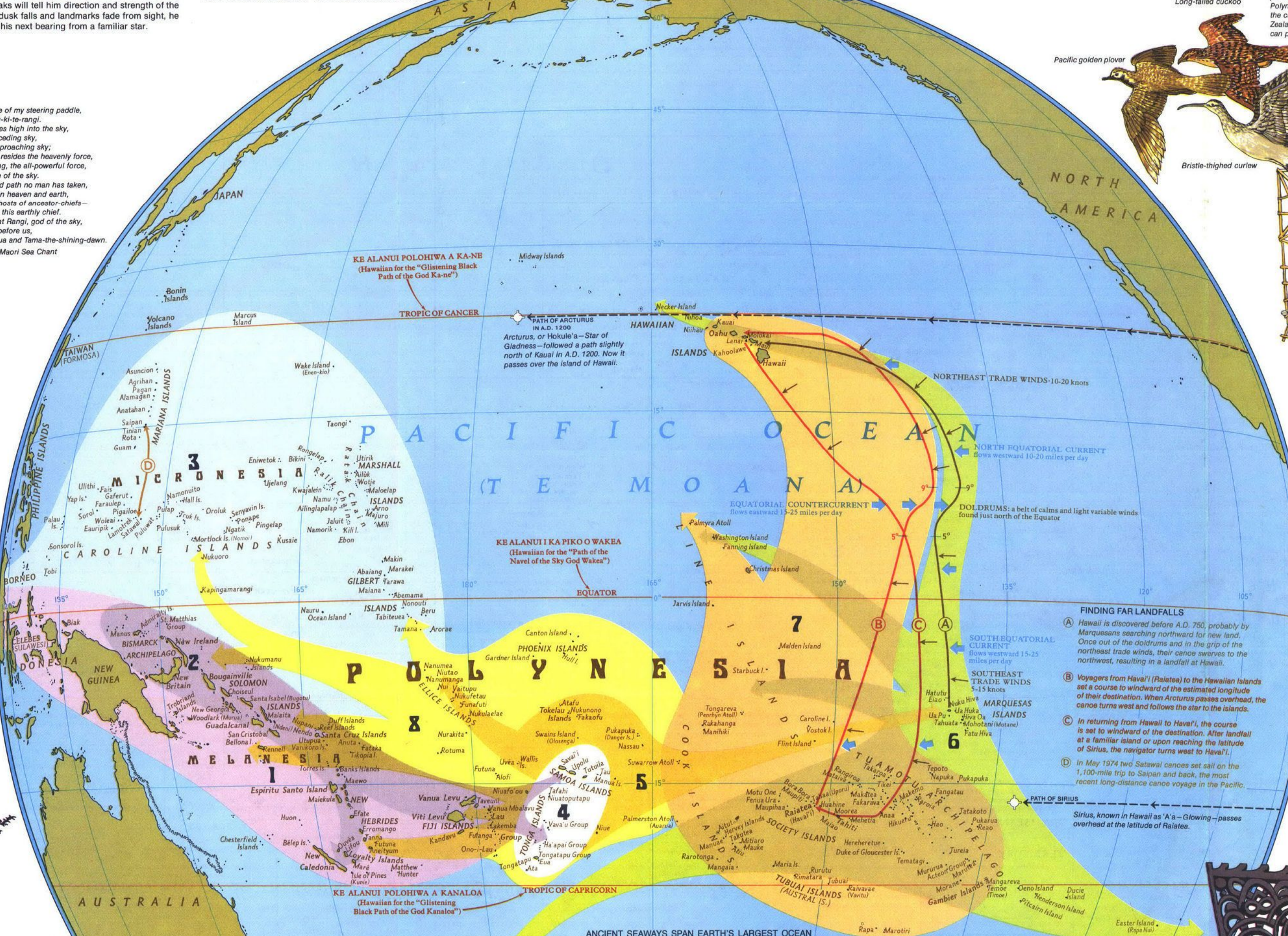
FLIGHT PATHS: Heading for their fishing grounds at dawn, returning to their roofs at dusk, such seabirds as frigates, terns, and boobies point the direction to windward, while seaweed indicates an up-current reef. Light green underside of a cloud heralds the presence of a distant island.



SWELL PATTERNS: Main swell bounces back from an island, and bends around it, creating swell patterns that reveal the island's bearing. "I feel the sea hit the canoe, shake him, like he move him go back," says a Polynesian. Meeting the reflected swell at an angle, the navigator turns into it and proceeds toward his unseen landfall.



ISLAND BLOCKS: Birds, cloud formations, and other signs of an unseen island expand a pinpoint landfall by a radius of 25 to 30 miles. In island groups the circles overlap, forming a screen hundreds of miles wide. Sailing from Mikoto to Tahiti, a voyager could aim for the center of the Society Islands, then change course after spotting familiar land.



SHIPS WITH SOULS

The building of a canoe was a religious event, marked by prayers, ceremonies, and feasts. On the last night of the moon before construction began, Tahitian craftsmen "put their adzes to sleep" in a sacred place, and implored Tane, god of the land, to charge them with his power. Next morning, the men "awakened" their adzes by dipping them in the sea, and work proceeded.

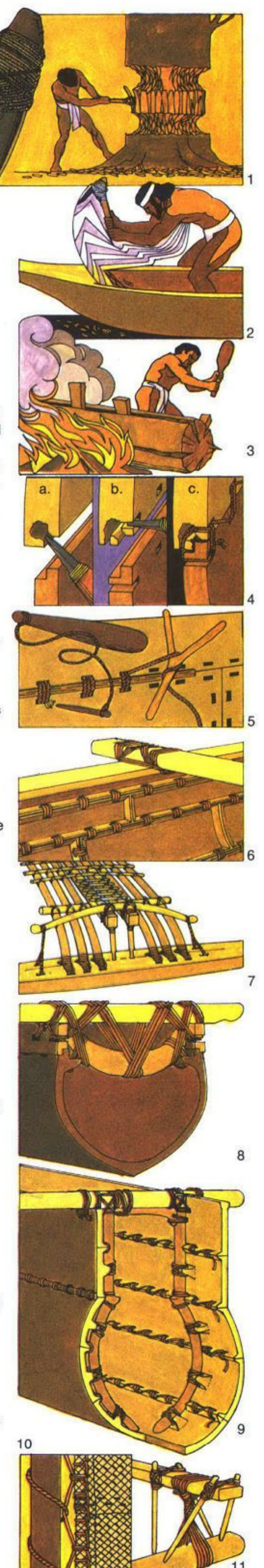
Since trees were the children of Tane, the workers invoked the god's permission before felling them. Wielding a stone adz, prime tool of a people without metals, a woodsman made concave cuts around a tree trunk, then chopped away the wood between the cuts (1). With songs and chants, the entire community turned out to haul the great logs to the canoe yard. There the adz fairly flew, as an artisan heaved a keel or carved a dugout (2). When blades grew brittle with heat, craftsmen cooled their adzes by plunging them into the moist trunks of banana trees, then sharpened them on blocks of sandstone.

Green logs were heated on a fire until they split (3). With wedges and maul, a workman chiseled off planks for a sailing canoe's hull and deck, then brought them to shape. Children dragged strips of pandanus leaves to the workers, who plaited them into sails with a texture almost as fine as cotton. Gosspingid old men rolled coconut-husk fibers into string on their thighs, then braided it into a cord called senit.

The builders lashed hull planks together with the senit, again invoking the assistance of Tane: "This senit of thine, O Tane, make it hold, make it hold. To hold, make it hold. To hold, make it hold." In Samoa, planks were carved with flanges along the interior edges, then lashed together through holes in the flanges (6). The all-purpose senit bound a Marshall Islands outrigger float to its booms (7) and lashed the outrigger boom to the hull of a Hawaiian *waikahi* (8). Hull planks of the Fijian *nidrua* were added to exact curvature, then lashed with senit (9). Vertical ribs added strength.

Hawaiian snaked loops of senit along the mast to secure the sail (10). Samoan pegged outrigger canoe to senit, then secured the assembly with lashings (11). Amid masting and fine dress, the community witnessed the launching of the canoe. Built under the tutelage of the gods, the vessel was regarded as possessing spiritual power, and was welcomed by the people as a living member of the community. When a tree in Hawaii was about to fall, the priest shouted: "Now you are a tree. Soon you will become a man."

Construction of a large canoe took years—the mighty *nidrua* as many as seven. Since Fijian chiefs paid their craftsmen with feasts, the faster the work, the more frequent the feasts. "A fare tu i kete." The chopping is in the belly," ran a proverb.



- ANCIENT SEAWAYS SPAN EARTH'S LARGEST OCEAN**
- 1 Melanesia (which means Black Islands) is the region of first human settlement in the Pacific. Dark-skinned Southeast Asians inhabited New Guinea more than 25,000 years ago.
 - 2 Lapita pottery, found from New Britain to Samoa and Tonga, reveals the presence of an ancient seafaring people, the immediate ancestors of the Polynesians.
 - 3 Micronesia (Small Islands) received voyagers from the Philippines, Indonesia, and islands north of New Guinea between 3000 and 2000 B.C.
 - 4 Polynesia (Many Islands) saw its first settlements in Tonga and Samoa some 3,000 years ago.
 - 5 Polynesians from Samoa and Tonga sailed east to the Marquesas, north to the Tokelau, and northwest to the Ellice Islands about 2,000 years ago.
 - 6 Before A.D. 500, Marquesan explorers reached Tahiti and Easter Island, later establishing themselves in Hawaii, New Zealand, and various eastern Polynesian islands.
 - 7 About A.D. 1000 Hawaii (Pleiades) became the religious and cultural capital of the Society Islands. From here high-ranking adventurers sailed to establish their rule in the Hawaiian, Cook, and Tubai Islands, and the Tuamotu Archipelago.
 - 8 During the past 1,000 years Samoans and Ellice Islanders penetrated Micronesia and Melanesia to establish such isolated Polynesian outposts as Kapiganganrangi, Nukunoro, Nakunama, and others. Fierce Tongans ranged far to the west and north to dominate West Polynesia.

How did the sweet potato, native to South America, get to the fields of the Pacific Islands? Perhaps a drifting Peruvian craft reached the eastern edge of Polynesia, or a Polynesian craft touched Peru, introducing the only food plant native to Asia or the Pacific.

Tongkaki. Fair-weather voyager, this Tongan canoe became a maverick in storms, requiring several men on the huge steering paddles.

Anaetai. Cowrie shells decorate this graceful Samoan fishing canoe.

Pahi. Master shipwrights, the Tuamotuan fashioned a crazy-quilt of planks into a superb vessel that roamed their 1,000-mile-long archipelago—and sailed west to Tahiti.

Wa'ho'u. Graceful as seabirds, curved sternpiece adorns this double-hulled Marquisian canoe, helping to blunt waves of a following sea.

Waka Taua. Powered by sail and paddles, a Maori war canoe heads for battle (left). Craftsmen adzed the hull from a plant log, designing the vessel for beauty as well as war. An intricate carving graces the stern (above).

Waka. In quest of tuna and bonito, this craft (left) veers far from its atoll home, Kapiganganrangi.