The Sailing Canoes of Ailuk Atoll

Traditional watercraft keep a remote Pacific Island alive

Text and photographs by Amanda Witherell

Asking the people of Ailuk Atoll why their sailing canoes are important is like asking a suburban family of five why they need a minivan. Although these boats are constructed of cheap plywood, rigged with pot warp and flotsam fishing gear, and propelled by plastic tarps for sails, they aren't simply grocery-getters. They are, in fact, the heirs to an ancient, ingenious design, and they offer a glimpse into how a particular population of Pacific Islanders once lived, and how they still thrive today.

"The canoes are the only reliable means of transportation to go to the other islands in the lagoon to get food, to fish outside the lagoon, to make copra, to get materials for handicrafts that the women make, which is one of the only sources of income besides copra," says Rufina Jack, owner of a 24′ outrigger and thrice-elected mayor of this remote Pacific atoll.

Situated 10 degrees north of the equator and 10 degrees west of the International Dateline, Ailuk (pronounced "eye-look") is one of 29 atolls spread across the 70 square miles that compose the Marshall Islands. As early as the 18th century, European explorers praised the speed and design of these ingenious canoes, but today very few of the more than 50,000 inhabitants of this water-bound republic own any kind of boat. Only one other atoll besides Ailuk—called Namdrik, 300 miles to the southwest—still has sailing canoes as part of everyday life.

"I had no idea about the canoes before I came here," says Timious John, a native of Enewetak, an atoll 450 miles to the west, where no canoes have been built since 1964. "They make living here really special." The canoes also make it possible for him, as pastor of Ailuk Protestant Church, to minister to both villages in the lagoon. He wasn't able to travel among such remote population centers at his last post on nearby Maloelap,

***Above*—The remote Pacific Marshall Islands archipelago was once rife with canoes, but today this tradition survives only on the atolls of Ailuk and Namdrik. Among the features that define a Marshallese canoe are a slightly asymmetrical hull and a leeward cargo platform (obscured here) that can carry anything from 100-lb sacks of copra to small, live pigs. Here, Tokjen Takju steers a canoe from Ailuk to Enejelar.**

Traffic in and around Ailuk consists solely of canoes, which are dispatched like taxis to transport friends and family between the two villages.

an atoll twice the size that has no sailing canoes and ekes by with a few malfunctioning outboard motors.

With a 13-mile-long lagoon shaped like New Hampshire, Ailuk's western barrier reef barely breaks the surface; the eastern, windward edge is a north–south string of 53 beautiful, sandy islets. All but three are uninhabited, and any one of them could play the leading role in a poster campaign for Paradise. The main village of Ailuk anchors the lagoon. It is a half-mile square and home to 300 people, two Protestant churches, an elementary school, one road, two cars, and a dirt runway of an airport so basic there's no windsock. The other village, of 49 people, is on Enejelar, the third islet from the top of the atoll; it's about 90 minutes to the north by canoe.

And canoes are truly the only way to travel. With their outriggers gliding low, then flying clear of the waves as gracefully as a shearwater, it's said these fast, simple vessels were designed with bird flight in mind. They embody the essence of sailing.

Sailing and Design

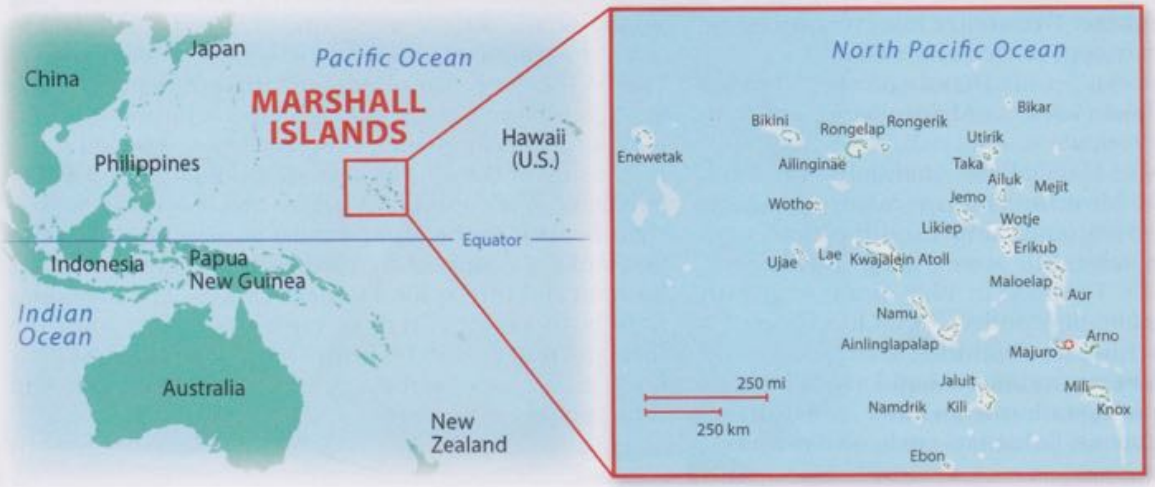
Nack Jidok and his cousin, Taidik Mae, are Ailuk residents who sail a canoe built by Jidok's father-in-law about ten years ago. Jidok and Mae both earn quarterly paychecks of US$130 to $160 working as policemen. They also fish, and they work in the copra—coconut meat—industry, and routinely sail to Kapen, the northernmost islet, where their family cultivates coconuts.

Jidok's canoe has the tired look of a workboat in constant use: paint is chipped from the plywood hull, the screws in the deck are rusted, and sunlight pierces through pinholes in a tarp sail stretched to its limit by the gusty winter tradewinds. Still, just a couple of weeks earlier, during the island's annual Liberation Day celebration, Jidok sailed his boat, ILOWA, to a first-place finish in the three-class canoe race for a $75 prize.

Jidok's canoe is 24′ long and carries a 22′ boom and sprit. The sprit supports the leading edge of the lateen-style sail, which tacks to the bow. The mast is nearly the same length as the sprit and boom and it rakes forward about 20 degrees. It is topped by a long, tusk-shaped hook angled to prevent the sprit from sliding over the masthead. Jidok also has a "racing sail" that sets on a 27′ boom and similar-length sprit; he uses this during the lighter-air summer months.

What Ailuk's canoes lack in surface polish they make up for in speed and grace. Jidok says the 13-mile trip to Kapen typically takes 90 minutes, for an average speed of 7 knots. It's a smooth ride: the flexibility of the lashed outrigger stabilizes the boat and absorbs bumps. Three-foot chop disappears beneath the center platform without a bounce. But it's also a wet ride: the driest seat is Jidok's, at the helm. Mae sits or stands in front of him, keeping tension on the mainsheet with a turn around the mast in a groove worn deep into the wood.

Flexibility is key to the construction. Though a few nails and screws hold the deck to the hull, all other fastenings are cheap nylon cord or 100-lb-test fishing line scavenged from snapped trawling rigs, lashed tightly, and generously coated with house paint. (The cordage for rigging and lashings once came from coconut-fiber sennit, which took months to prepare.) The outrigger,



The Marshall Islands comprise 29 atolls, 1,156 islands, and slightly more than 50,000 people—half of whom live on Majuro, the site of the capital.

Tacking a Marshallese canoe involves releasing the downhaul on the sprit and boom and moving the tack from the bow to the stern—which, respectively, become the new stern and the new bow. Here, Taidik Mae moves the sprit to the new bow while changing tacks.

or *kubitaak*, is approximately 14′ long; it is lashed to a parallel timber above it, the *jojo*, which in turn is fixed to the end of several long beams lashed to, and jutting out from, the canoe itself. The kubitaak is typically a solid, heavy piece of breadfruit wood, and it serves more as ballast than as a float. It always stays to windward: the rig is reversed when the boat changes tacks.

Changing ends rather than turning the boat through the wind—"shunting"—is, in fact, the defining characteristic of Marshallese canoes. During the procedure, the mast pivots in its step as everything else—sail, boom, sprit, tiller, bowman, and helmsman—swing around it. It sounds complicated and troublesome, but when it comes time to change tacks, Mae releases the sheet and Jidok lets the boat come head-to-wind, with the sail luffing. ILOWA glides to a stop. Mae releases the forestay, and this releases the tension holding the mast forward and also eases the pressure on the sprit so it may be lifted free of the bow and carried to the opposite end of the boat. Jidok unships the rudder, setting it on the center platform as he tightens the backstay, making it serve now as the forestay. The mast rakes toward the new bow—formerly the stern—and the stays are tensioned through holes drilled into the *dipakaak*, which are identical well-worn cups of wood at either end of the hull in which the heel of the sprit sits. The sprit and boom are lashed together, and are simply braced against these curved wooden stoppers. The sheet is then led to the new helm position, the rudder shipped

The Future

Ailuk villagers between the ages of 14 and 18 move to Wotje Atoll to attend the only high school north of Majuro. This experience is the beginning of a life away from Ailuk. Many will move to the capital for college, then stay there. Others will relocate permanently to the United States.

Few return, but Nisa Tibon is one who did. He had left his native Ailuk to study at Brigham Young University in Hawaii, but the lack of familiar foods left him longing for home. Now he fishes every day and plans to build his own canoe. As Ailuk's elementary school principal and eighth-grade teacher, he's observed that most of his students "want to leave and go to Majuro or Hawaii." What this means for the canoe culture, he can't say, but all the warning signs are there. "We almost lost everything," he says, recalling the disappearance of woven sails.

Alson Kelen, working with Dennis Alessio, founded Waan Aelõñ in Majel (WAM), a Majuro-based program for high-school dropouts and at-risk youth that uses canoes and other Marshallese traditions to teach essential life skills. Most students are Majuro residents or recent arrivals from outer atolls, and the challenges they face include substance abuse, gang involvement, and teen pregnancy. Founded in 1998 as an outgrowth of Alessio's documentation project, WAM has fostered a canoe revival, teaching boatbuilding, seamanship, and sailing. The teachers are traditional builders, and there's an annual race drawing sailors from outer atolls, including Ailuk—whose teams, Kelen says wryly, always win.

The six-month curriculum includes basic woodworking skills and canoe building techniques for 25 kids. It has evolved over the years to also include English and math proficiency, as well as life skills such as how to manage a bank account and the importance of arriving for work on time. Graduates receive two years of further mentoring, and the program has created a small but growing generation of gainfully employed young adults.

Today, the kids on Ailuk don't seem destined for WAM. Canoes are an integral part of their lives now, and they all want canoes when they grow up. They begin racing carved models and soon graduate to korkors and, eventually, tipnols. And just like kids anywhere, they transform what they see every day into their play. Poised at the water's edge, each holds a small, homemade toy canoe fashioned from what's immediately at hand—the long, shriveled breadfruit fallen from the drought-stricken trees. Stiff green leaves are carefully torn into fat triangles for sails, laced to sharpened stalks for booms, and stayed by thin strips of palm tied to the outrigger. The countdown begins and, as one, they drop their boats into the water amidst cheers. One boat tips and sinks, a couple bob to leeward, but most sail off as buoyant and sure as their fathers' canoes. The ingenious little boats sail hundreds of yards from shore, over the reef, and out of sight. It's a one-shot toy: the kids set their boats on a course and watch until they disappear. And then they build another.

—*AW*

DAVID HARTMAN

Here we see the smallest of the three distinct Marshallese canoe styles, a *korkor*. Canoes of this type are typically paddled by no more than two people, though they also may be sailed by children.

on the new stern, and the sail sheeted in. The boat speeds away as water quickens against the hull as a fresh breeze fills the tarp sail. There is no drama and no chaos, and little way is lost during the procedure.

Not that they need to change tacks much. The long, north–south orientation of Ailuk's lagoon, combined with consistent tradewinds from the northeast to southeast quadrants, make for one-tack trips to Kapen, sailing close to the wind. The homeward course is typically more of a beam reach or broad reach, which is a little easier despite the added weight of the day's work—which can be as much as 800 to 1,000 lbs of copra.

History and Construction

More than 2,000 years ago, travelers in canoes from Southeast Asia initially populated Micronesia. From that time until World War II, a particular type of Marshallese outrigger evolved in three sizes: *walap*, which measured up to 100′ and carried about 50 people on long distance voyages; *tipnol*, which were 20′–30′ and carried up to 10 people for inter-island travel; and *korkor*, which were small canoes built for two and typically paddled.

It's been decades since any walap have been constructed. Today, Ailuk's sailing canoes most closely resemble tipnols, which were designed specifically for rapid transport and fishing. They come in two basic lengths: the large ones are 25′, and the small ones are 18′–20′. There are korkors, too; they measure about 12′. Smaller sailing canoes have proportionally larger outriggers for stability. There are about 15 medium and large canoes on Ailuk, and most are sailed daily, outside the lagoon to fish or inside it for transporting people and cargo. There are just as many korkors, typically paddled no farther than the closest fishing reef or sailed by kids sharpening their skills.

The hulls of these canoes were once built of sewn-together planks of breadfruit or a single large harvested or driftwood log carved out with sharpened clamshells. Breadfruit (*Artocarpus atilis*); *kiden* (*Tournefortia argentea*), a local timber akin to beach borage; and other trees were often planted and pruned for specific canoe parts. A unique method of measuring and lofting curves involved the long, green leaves of pandanus (*Pandanus tectorius*), or "screwpine," which were cut into 1″ × 3′ lengths. The distance from the tip of the canoe builder's middle finger to the middle of the wrist was the standard of measurement and the leaf was folded to that distance five times, making five sections, which were folded again to make a total of ten equal measurements. With the roughed-in canoe hull turned upside down, the line of the keel was projected forward; from this line, the leaf was used to locate the midpoint in the curve of the bow. Since the hulls are symmetrical, the same method was used to create the curve at the other end of the boat.

Pandanus leaves were also soaked in seawater and pounded into workable fibers for sailmaking and hull caulking. Spars were often *lukwej* (*Calophyllum inophyllum*), of the mangosteen family, one of the largest species growing locally. It's still used for outrigger beams and spars.

Most canoes today are built from construction-grade plywood reinforced with epoxy resin, nailed to frames of carved kiden. A large canoe requires about six sheets of plywood for the deck and hull, butted together and backed internally with 4″–6″ reinforcing strips of plywood. Outriggers have five supporting beams created from scarfed kiden, though they also use breadfruit, lukwej, and "lumber"—the catch-all term for any hardware-store-bought wood, which is typically pine 2×4s and 4×4s. Two beams protrude through the main hull, two abut it and curve down to meet the

All of a canoe's components are lashed together, usually with cheap nylon cord or heavy-duty fishing line scavenged from snapped trawling rigs. This view shows the beams connecting the outrigger to the hull.

Nack Jidok steers his canoe, ILOWA, past another canoe that's returning to Ailuk village with a load of copra and kids.

outrigger. Some have a fifth, center beam that extends from the outrigger and ends abruptly about two-thirds the distance from the hull; its purpose is unclear, though it could be for ballast.

Knowledge of canoe building was historically concentrated in certain families due to societal hierarchies still in force today, and these skills are still passed down through families. If anyone could be considered an innovator of the craft, it's Rice Senight, who learned traditional methods from an uncle and has spent his life refining his designs through the adaptation of modern materials.

"His canoes are always the fastest," says his friend Tokjen Takju, who also serves as translator, since Senight speaks very little English. "They're lighter because he uses less wood. This canoe only needs three people to carry, it's so light," Takju says as he taps the baby blue hull of Mayor Jack's boat, which won the Liberation Day race last year. Its frames are slightly thinner than usual, and so are its outrigger beams. It was an exploration of the structural limits of a canoe: the outrigger beams snapped when the boat accidentally changed tacks during this year's race.

Senight is also the island's sailmaker. Sipping milky instant coffee from an oversized mug, he appraises an old genoa donated by a cruising boat's crew, directing younger men where to cut to make the most of the precious Dacron. Eyeing the new foot, he marks out a generous 6″ and snaps a carpenter's chalkline, using a stick to further fair a graceful curve.

Originally, sails were constructed of pandanus leaves, woven in a special two-layer method, tighter at the edges and looser in the center to flex and allow gusts to pass through, like a built-in reefing system. That unique sailmaking skill has been lost, though there are some nascent efforts by the University of the South Pacific to reconstruct the method based on studies of old weavings and photographs.

Sails are usually seamed by hand with any available thread—fishing line, yarn, string—and sewn with scraps of 100-lb-test line directly to the boom and sprit. A thin cord is sewn to the sail's luff and foot as a boltrope and used to haul out the corners. Cheap, 20′ × 20′ plastic tarps are the "sailcloth" of choice, the more colorful the better, though genuine synthetic sailcloth is highly coveted. Ailuk sailors are competitive, and even when working they often wait at the water's edge for another boat to finish rigging so they can race each other out to their destination. They take great pride in their boats and are open to innovation. To outperform their neighbors, they introduce any modern modifications they can get their hands on—blocks to better control the mainsheet, or rigging refinements using cherished bits of first-world hardware obtained in trade from passing yachts.

All of these modern adaptations might make Ailuk's canoes seem like mongrels when compared to the original Marshallese outriggers. But they have one other distinction: they have survived.

In the process of transforming a cast-off Dacron cruising genoa into a sail suitable for a 25′ canoe, Tokjen Takju and Rice Senight examine the lashings that join the boom and sprit. Shape is built into a sail by adding curvature to the luff and foot, and by shaping the spars that support the sail's edges.

Kids on Ailuk have only the toys they make. The racing of pint-sized canoes fashioned from breadfruit and leaves is a rite of passage among the atoll's children.

Survival

The arrival of whaleships and European trading schooners marked the beginning of the end for Marshallese canoes. Many island chiefs were attracted to the larger vessels and instructed their canoe builders to copy them; construction of voyaging *walap* lagged. Before World War II, Japanese occupying the atolls banned interisland travel by canoe, leading to a further decline. Canoes played a lifesaving role during the war, however, carrying many villagers to safer atolls. Peacetime brought an influx of American goods, including outboard motors that were assumed a superior type of propulsion to the native sailing canoes. Gas-powered skiffs soon reigned. But the introduction of first-world goods at first-world prices to a population earning third-world wages is an equation that's never worked—a fact that Dennis Alessio proved back in 1991.

Alessio, a boatbuilder from the U.S. West Coast, supervised the joinery of TOLE MOUR, a 156', three-masted topsail schooner built during the 1980s as a floating clinic for the Marshall Islands. The project brought him to Majuro, where his interest in boatbuilding led him to the few remaining canoe builders. Alessio eventually became deeply involved in building canoes and preserving the tradition, which led to a research and documentation project of existing canoes on five atolls. Called *Waan Aelon Kein*, the project included Ailuk, which he visited in 1991, surveying 23 canoes and noting the differences in construction from adjacent atolls. His documentation represents some of the only detailed information about how canoes were designed and built at that time, and it also uncovered several reasons why their demise was imminent. In his study, Alessio wrote, "outrigger canoes were economically feasible over outboard motor systems for an outer islands economy and lifestyle."

Alessio's assessment, and his sharing of contemporary boatbuilding methods, tools, and materials, fell on deaf ears on all atolls but Ailuk. These adaptations prepared Ailuk well for what would be a drought-stricken future: since 2013, the islands have suffered an extreme water shortage. Increased soil salinity due to rising sea levels has further stressed the atoll's resources. Distribution of water and food is thus critical, and this distribution is done economically by wind-driven canoes.

Jommy Bunglick still uses a canoe he built in 1992 to sail between the villages of Ailuk and Enejelar, where he lives. Earlier, he built two others, learning from "old builder-men who are all dead now." There were more canoes 40 years ago, when he was a kid, and canoes today would still be built from the same materials if they were available, but circumstances have forced change. "We need more kiden and breadfruit, but all the trees are too small at the moment, and because of the drought they aren't growing as well," he says. "This canoe is old, but we don't have money to build a new one, to buy plywood, paint, resin."

A new canoe today costs about $1,000 in imported materials. Two years ago, Mayor Jack successfully applied for an $11,000 grant to revive the island's aging fleet. "Many of the canoes are very old and are passed from father to son. People were still sailing them, but they all needed something—a new sail, a new mast, a new boom, paint," she recalls. Another $10,000 grant for more materials is pending. "Everybody knows how to repair them, but some people aren't able to because they don't have the money."

In spite of these constraints, Ailuk's canoes have managed to survive, because, people say, they simply didn't let them go. "We never stopped using them. It's in our culture," says Mayor Jack. "Other islands did stop. They wanted outboards. Ailuk has canoes. There is not much fuel available for motorboats, and we try not to use it. Most people can't afford motorboats and fuel."

Gasoline, which sells for $10 per gallon, arrives via quarterly trips of notoriously unreliable government ships: in early 2016, nearly six months passed before one showed. At great expense essentials can be flown in from Majuro, 200 miles away, via Air Marshall Islands. Planes are scheduled weekly, although delays are not uncommon. A few years ago, Mayor Jack broke her leg and waited three weeks for a flight to the hospital.

Given a choice between an outboard boat and a canoe, Tokjen Takju doesn't deliberate: "A canoe is better than an outboard because we always have the wind." To Takju, the equation is simple: A life without canoes would mean "no food, no fish, no copra, no money."

New Hampshire native Amanda Witherell lives and travels aboard the 41' sailboat CLARA KATHERINE, which is currently docked in Tauranga, New Zealand. She has reported on the arts and entertainment scenes for the Capital Times of Wellington, and she covered energy, homelessness, free speech, and environmental issues for the San Francisco Bay Guardian.