



Historic Preservation Office - Waan Aelōñ in Majel
HPO/WAM Program
2014 FINAL REPORT



RMI Historic Preservation Office
Waan Aelōñ in Majel Program
(Canoes of the Marshall Islands)
Final Report
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Waan Aelōñ in Majel (Canoes of the Marshall Islands)

(WAM) is a grassroots non-profit, non-government organization that trains Marshall Islands youth based on the traditions of the Marshallese canoe. WAM provides vocational and life skills training to youth-at-risk using the medium of traditional outrigger canoes, boat building, carpentry and woodworking. The program links the new generation with the old, working together to keep this unique aspect of Marshallese culture alive, while simultaneously addressing serious social problems affecting youth in Marshallese society. The WAM mission is to work with youth, their families and the local and international community to perpetuate and safeguard Marshallese culture and tradition through canoe building and sailing, and through this cultural linkage develop life skills and modern work skills that create meaning in the lives of all participants. Established in 1989, WAM has strong support from the RMI government and society, and is well recognized internationally for its history of successful programs.

The RMI Historic Preservation Office (HPO) awarded the Waan Aelōñ in Majel (WAM) program a total sum of USD \$21,638.00 to support the construction of one full sized sailing canoe and five small-scale canoe models as well as documentation of the building process. As mentioned in the contract, the HPO program was to coincide with a WAM's six-month program. The program structure includes a training manager, an English/Math teacher, a male and a female counselor, a cultural/canoe master



builder/trainer, and an assistant trainer. This program takes young men/women between the ages of 17 and 25, and at this time the maximum entries is 25.

I. CANOE MODEL BUILDING

Canoe model building training has been a successful part of the Waan Aelōñ in Majel program that educates the trainees about the names of parts, building materials, and tools in order to ready them for the actual canoe building. WAM makes sure that the trainee builds the models to the scale of an actual canoe. This allows them to practice by showing them the process of building a full size canoe.

In the past, WAM brought in a master weaver from Ujae Atoll to train our trainees in the traditional weaving technique of the mat sail. She was one of the actual three that we worked with to revive this unique knowledge. Traditionally this skill was for women only, but she has been teaching it to both our young male and female trainees.

a. Canoe and Canoe Model building materials

Following are local trees that are used for both canoe model building and actual size canoe building:

It was common for Marshallese to plant trees specifically for building canoes. In fact, this used to be a common practice in most if not all, boat building areas of the world. A good example locally is the breadfruit tree, from which the hull and outrigger float are built. It would be cultivated and probably pruned to shape until they were old and large enough for a canoe. During the 50 or more years that the tree grew, people would literally enjoy the fruits of their labor eating the large edible fruit grown at the branch tips. This cultivation practice could very well have been uninterrupted from the time the first settlers arrived until the landing of the trading schooners. This factor is probably the major reason for the decline of the construction of the voyaging canoes, with the cultivation of the tree following close behind. Today, to my knowledge, the only time I've witnessed tree planting with canoes in mind has been during the construction of the canoes for this project, where a number of breadfruit trees were planted to replace the non fruiting old ones which we cut down. The types of wood used for canoe building varies little between most of the atolls, usually relating to the preference of woods used by the builders (Alessio, 1989a, 1990a, 1991a,b, c, 1993). Along with a bit of technical information and a few common uses I've seen with these materials, I will be explaining the varieties of woods that we used for this canoe project, as well as the types of woods which are common for particular canoe parts. The woods described herein with a star before the name represent the drift logs and imported woods used for this canoe.¹



¹ A good source of information about wood species of the Marshall Islands is Bryan (1967 &1972). Another source of information on the description, distribution and uses of plants and environments of the Marshall Islands is Merlin, Capelle, Keene, Juvik and Maragos (1994).

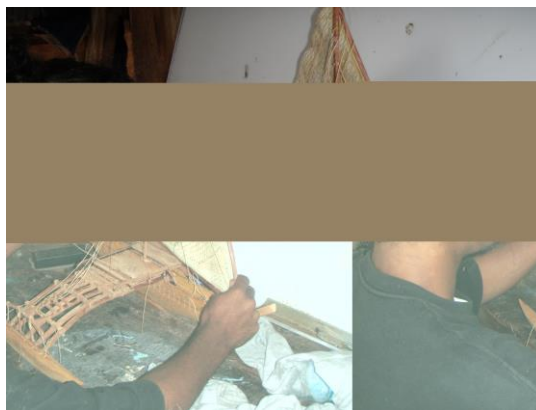
Armwe: (*Pipturus argenteus* - URTICACEAE) Growing to heights of 15-20 ft (5-7m), *Armwe* is indigenous to the Marshall Islands. A rather common tree with simple, acuminate leaves, almost hand-like with miniature flowers on hanging clusters. The fruits are small, soft, whitish berries. The tying line (*ekkwā* in *armwe*) used in making the traditional Pandanus sail as well as the traditional fishing line (*eo* in *aelōñ kein*) comes from the skin of the young shoots of the *Armwe*. This line is very strong and is usually made in lengths of 100 ft (30m), but can be produced to any desirable length. Even the small 3/16 in (0.5cm) diameter line can withstand the pulling weight of hundreds of pounds.²

Bōb (*Pandanus tectorius* - PANDANACEAE)

This is a wide-branched tree that grows to the height of about 25 ft (8m). The trunk has aerial prop roots and long leaves up to 10 ft (3m) in length with thorny leaf edges. It is sometimes referred to as the “screw pine” because of the twisted form in which the leaves are produced at the end of the branches and the many-sectioned fruit has the general resemblance to a large pinecone. The large edible fruit is an aggregate of many angular, wedge shaped sections or “keys” that turn orange as they



mature *Bob* is one of the few edible plant species found in the Marshalls Islands. Not only is it an important source of vitamin-A, it also has small amounts of thiamine, riboflavin and vitamin-C. Horizontal staging (*bakutu*) is built from the forked stems of the *Bob*, laid in such a way that the heavy *jim* stem piece can be slid in and out of position while fitting it to the *jouj*. From the scrapings of the aerial root of the Pandanus tree (*liok*), comes a caulking (*jakaibo*) driven into the lashing holes in the hull of the canoe to prevent water from leaking into the canoe. The long leaves (*maan* in *bob*) are dried and pounded to supply for baskets, mats, hats, fans and most recently the *wūt*, made from fresh flowers and worn on the head, which has been copied and has become a very popular item locally with the women. *Maan* is common for roofing and siding thatch (*aj*) for houses and in the past, traditional sails (*ujele*)



for their outrigger canoes. The dried leaves were also used as a caulking for the seams of the outrigger canoes (Alessio, 1993). In the northwest quadrant of the Marshalls Islands of which Ujae belongs, grows two variety of *bob* prized for their supreme strength and durability. Sailors would voyage from all over the Marshall Islands to get the *maan* from the *Kerōk* and *Kūnuum* for their canoe sails. An old chant about this *maan* goes like this: “*Rekemelet maan in Kerōk ko iaar tilimi, eitabtab Kūnuum*” meaning “people talk about the *Kerōk* that I make, but there is much *Kūnuum*”, relating to how popular

this *maan* was, and still is, for that matter. In addition to this, the green *maan* was and is still used today as the unique measuring and design tool for outrigger canoes designs.

² The author Merlin, et al, mention that *Armwe* cordage is made from the bark of the tree and is used to bind canoe parts together. In all of my research where I have specifically inquired about this line being used for canoe lashings I was told that it was not. This error appears in one book on the Marshalls (Merlin, 1994: 32).

Ekkōñ (Terminalia samoensis - COMBRETACEAE) is an indigenous and common forest shrub growing to the height of between 6-50 ft (2-25m). It is used for the *erer* and the *lot* where *kōñe* cannot be found. Although builders have talked about the uses of this wood, I have never seen any of this wood worked since I began this project, as *kōñe* is the wood of preference. They mention that it is good for the *apet*.

Jijo (Calophyllum inophyllum - GUTTIFERAE) The European common name *Lukwej* is a member of the MANGOSTEEN FAMILY. The trees grow to heights of up to 60 ft (20m) with a canopy many times with the same diameter. It has simple lustrous leaves, which make the best spoons when eating fish gravy over rice on a breadfruit leaf plate. There are small fragrant white flowers in the center of the leaf cluster and hard round fruit about 1 in (2.5cm) in diameter, which the kids play baseball with, among other games. I've seen a 6 ft (2m) diameter trunk on many trees throughout the Marshalls. With this size you might imagine that they make very nice shade trees. In fact, every building project with which I've been involved in the outer islands, our canoe was built under the shade of one of these big *Lukwej* trees. The name *Jijo* is an old term with *Lukwej* being commonly used today. In 1989, I began testing the qualities some of the woods where I cut many planks from different species, observing their curing process over an eight-month period. The configuration of the wood grain is sporadic continually changing direction, resulting in warping and splitting during the curing process. Planing the wood is difficult as the grain changes continuously throughout the planks. Nonetheless, the wood has a beautiful lustrous sheen to it and is very hard. *Lukwej* is used for some of the longer parts of the canoe such as the *apet* and the *kie*. The builder has to be very careful when choosing the parts as the grain can go from long to very short and run right off the side of the piece leaving it susceptible to splitting and breaking. When a builder finds good long grained tree limbs for these parts, he has a strong durable piece, which lasts a very long time. (Alessio, 1990). It is also used for the *bōklap*, *jojo*, *kein-ioon-ere*, *jirukli*, *dipakaak*, *mweiur*, *jōbwe*, *jidjid* and the traditional bailer (*lem*). I thought this *lem* was incredibly heavy as all of the other *lem* I've seen were explicitly made from *Ma*, which cures out very light. The *Lukwej lem* weighs more when empty than the *Ma lem* weighs when full of water.



Kiden (Tournefortia argentea - BORAGINACEAE) It is an abundant forest tree with rough gray bark, rosettes of long, soft, hairy, gray-green leaves, and minute flowers and fruits on curled, "finger-like" flower stalks. One of the most widely used medicinal plants of the Marshall Islands. It is used for the *apet*, *jojo*, *kiju*, and sometimes the *kie* on the smaller canoes. Because of the strength factor (it has a soft cork-like plug through the center of the branches), it is used only for smaller parts of the larger canoes like the *kein-ioon-ere* and *jirukli*.

Kimeme (Lumnitzera littorea) is recognized by its rough bark and brilliant red flowers borne in terminal inflorescences, its entire, firm smooth leaves being narrowed below. It is a mangrove species and grows near the swamp in the interior of the island. Its wood is dense and is used primarily for the sacrificial keel piece *erer* on the hull, although it is occasionally use for the *kie* and *apet*.

Kōno (*Cordia subcordata* - BORAGINACAE) Called Kou in Hawaii. It is a small tree with gray-flecked bark, tubular orange flowers, and a globular fruit. The brush-like branches of the tree are long and curved with a dense and strong wood. It is used for the *apet*, *kein-ioon-ere*, *roñ*, *bōklap*, *jōbwe*, *mweiur*, *dipakaak*, *jojo*, *lem*, and sometimes on the small canoes, the *kie*. It is a very beautiful wood used for making canoe models.³

Kōnpat: Mangrove (*Sonneratia caseolaris*) this tree gets its name from *pat*, meaning swamp. In Namdik, this wood, along with *Joñ* are most desirable for making the *erer*. In fact, both trees are known by both names, *Joñ* and *Kōnpat*.

Kōnnat (*Scaevola frutescens* - GOONENIACAE). A common beach shrub-tree with Split-tubular white or purple flowers ½-2 in (1-4 cm) long and grows to the height of about 10 ft (3m). The leaves are bright yellowish-green 6-10 in (15-25 cm) long. This wood is used for the *roñ*, *jōbwe*, *mweiur*, *dipakaak*, *jojo*, *lem*, *pōtak*, *kein-ioon-ere*, and on the smaller canoes, the most desirable wood for the *apet*.

Kōñe (*Pemphis acidula* - LYTHRACEAE) This tree belongs to the crape myrtle family. It is a shrub or smaller tree with heavy, hardwood and wiry twigs, bearing thick, narrow leaves with white pubescence, scattered among solitary white flowers. This wood is so dense that it sinks. Carving and drilling holes produces clean and smooth edges, which polish during use. When the holes are chamfered at the edges they are the preferable wood for the line blocks and sheaves. As the wood seasons, it stays intact and stable, without any noticeable warping and very little shrinkage. Although it's hard, if your tools are sharp, it is a very easy wood to carve, but your tools have to remain sharp, sometimes with a sharpening every 10 minutes. If you saw this wood, you'll generally want to reshape your saw after a short amount of time. I've seen in longer pieces for the larger canoes "wet" looking lines very dark in contrast to the already dark reddish-brown color. These lines



tend to split very easily if worked. Because of this tight grain, *kōñe* has to be worked carefully as it is easy to split the wood at any location if chiseled. I've seen beautiful fly-fishing floats with the gorges made from *kōñe* in Namdik (Alessio, 1990). It is also the best wood for skids when launching the canoe. On the canoe, the wood is used for the *erer*, *lot*, *dipakaak*, *bwij*, *tarwak* and *debwel*.

*Mahogany, ***Maokoni*** The origin of this tree is unknown and grows in a variety of places throughout the world. The most common areas

are in the West Indies as (*Swietenia mahagoni*), also called Cuban Mahogany and Honduran

³ Merlin & others (1994:53) mention that *Kōno* is used especially as the keel of the canoe. *Kōñe* is the only wood I have ever seen as canoe keels with *Ekkōñ* being the mentioned, but never seen, second choice.

Mahogany. The wood is chiefly a tropical tree of the family MELIACAE. Its colors vary from a durable yellowish brown which can be light weight to a hard and heavy deep red. At the time of this writing I have not received the results of the lab reports as to the species and origin of the trees used to build this canoe. I can only guess that they could have drifted from the direction of the Philippines where the wood is commonly distinctive of any of several Philippine timber trees. These trees resemble that of the aforementioned true mahogany and known as: Philippine cedar, Narra, Lumbayao, Red Luan, Tanguile, Almon or the wood of the Philippine Mahogany, Bagtikan (Merriam Webster, 1986). The particular drift-logs, which we found and used for this canoe, had been sitting for more than ten years. We used one, the lighter colored one, for the jout and jim and the heavier, bright red one for the keja side planking. Drift logs are often used for many applications on the canoe with examples of the *ko*, *rā*, *bwā*, *pōtak*, *kūro jalto*, *ubōn won*, *roñ*, *kōdo* and *kein-ioon-ere*. Another drift-log we found was used for the two *rojak*.

Mā (*Artocarpus atilis* - MORACEAE) is a member of the Fig Family. There are numerous varieties of breadfruit known and distinguished by the Marshallese all of which grow up to 80 ft (25m) tall. The variety containing seeds (*Mejwaan* and *Mekanono*) generally grow in the interior of large islets; the seedless forms (*Metete*, *Bataaktak*, *Bukdral*, *Mebob*, *Mejoklap*, *Merool*, *Menaknak*) are planted as a food source. Both are large trees with large leathery leaves of variable shape, some deeply grooved or lobed. Male and female flowers occur in the same tree. The wood is durable and naturally rot resistant. The root system goes directly into the freshwater lens, drawing large amounts of water into the wood, easily noticed while working it. It maintains its stability during the curing process and planes out to an almost satin finish (Alessio, 1990). *Bataaktak* is the preferred breadfruit for the *kubaak*. *Mejwaan* can be used, but the risks are great that it might be too heavy for the application and some trees tend to have heavy pitch pockets which suck in water after they are cured out allowing accelerated water-logging and rot. Because of this, *Mejwaan* is always risky to use as the *kubaak* wood. *Mejwaan* is consistently the wood of choice for the main hull of the canoe when there are no drift-logs, because it is commonly regarded as the strongest and longest lasting of the breadfruit throughout the Marshalls, that is, when you get a good one.⁴ It also is a good choice for decks and planking for the *roñ* and *pōtak*. Even though I highlighted these two varieties as the preferred woods for the *kubaak* and the hull, others varieties are used as well.⁵



Ni (*Cocos nucifera* - PALMAE) The coconut palm grows to heights of up to 80 ft (25m) with fronds up to 12 ft (4-5½ m) and a flowering stock of 6-7 ft (2 m). I think it would be safe to say that the coconut tree probably has more uses than any other plant in the world. As it

⁴ I know this seems like a contradiction of terms, as I've just mentioned the heavy pitch pockets in the previous paragraph. The difference with the applications is that the *kubaak* is a solid piece, sometimes up to 12-16 in (30-43cm) thick, leaving it impossible to detect these pitch pockets until it's too late. On the other hand, with the planks being ¾-1½ in (2-4 cm) thick and even the bottom of the *jout* at 1½-3+ in (4-8 cm), these susceptible areas are easy to detect, cut out and replace with a healthy piece of wood.

⁵ All of the Marshallese outrigger canoes I've seen, had *kubaak* built from breadfruit (Alessio, 1989; 1990; 1991a, b, c; 1993). I imagine that through the centuries other woods were tried and possibly a stray drift-log or two might have been superior, but breadfruit holds fast as the number one choice.

would take me pages to mention them all, I will remain loyal to the use of the ni when we built our canoe. We used baskets from the fronds to hold the husks (*bweô*) while we soaked them in the lagoon for making our coconut coir lashing line (*ekkwâl*). We cut and shaped the main trunk for the staging (*bewa*) for the *jouj*. The spine of the leaf of the coconut (*nok*) was used as a needle for the *ekkwâl* lashing line. When coming in from the first seas trials, we used the *nok* for marking the leaks. The *kein alej*, a distancing/measuring tool, we made from the middle spine of the coconut leaf (*melwe*). Of course with the same middle spine we made great spoons to eat with. The individual leaflets were good throwaway tape measures and place markers for short distances. The fronds made good temporary skids for launching and beaching the canoe.



*Pine; Genus (Pinus) The straight grained white or yellow, usually very durable, often highly resinous wood of a pine, varying from extreme softness in white pine to hardness in the longleaf yellow pine or related forms. The mast (*kiju*) is made from yellow pine power polls.

Piñpiñ (Hernandia sonora - HERNANDIACEAE) A large tree growing up to 65 ft (20m) or more with large heart-shaped leaves and small white 3-petaled flowers on the male and 4-petalled flowers on the female. I've

seen these huge trees on many of the atolls from Namdik in the south, to Ujae, 230 miles to the north. It's common to see double and triple trunks, many times shooting straight up into the sky with no branches for the first third of the distance. The men from Ujae say *Piñpiñ* is good for making *rojâk* and *kiju*.⁶ The builders in Namdik do not like this wood for canoes as they say it holds too much water and rots quickly. We built two 5 ft (1½ m) canoe models in Namdik with *Piñpiñ*. It was easy to work, very light in color and weight and was very stable when cured out. One of the models was given to the Australian Embassy in Phone, FSM, who funded that particular project. The second model is still on display at the Alele Museum here in Majuro and after close to six years, it looks as good as new (Alessio, 1990).

Wût (Guitar speciosa - RUBIACEAE) also called *witor ut* are two small trees which represent the coffee family, has pear-shaped leaves, tubular white flowers and hard smooth brown fruits. There is also a flower tree often cultivated into a hedge (Polyscias guilfoylei [Bull Bailey]) or (P. Scutellaria). The wood is a popular choice for the *kie*, but none was available in the size the men needed. I have seen two beautiful *kie* built for the Enewetak Voyaging canoe (Alessio 1993). The *jirukli*, *bôklap* and *dipakaak* have been made with the *wût* on Ujae. On this canoe, the men used it for a couple of the *apet*.⁷

⁶ The builders in Namdik will not use this wood for any parts of their canoes as they say it holds too much water, is too light and rots quickly. They are sorry that this is the case as it is easy to work, very light in color and weight and very stable when cured out. We built two 5 ft (1½ m) canoe models with this wood of which one is still on display at the Alele Museum here in Majuro in new condition after six years (Alessio, 1990).

⁷ After seeing that the *wût* was an inferior wood for this application, as it was short-grained and split very easily having to be patched and lashed, I asked if this was a common choice for the

This is a scene from the documentary “*Waan Aelōñ in Majel*” (*Canoes of the Marshall Islands*)



apet. Both Macbi and Thomas said that they had never seen the *wût* used for the *apet*. When I continued by asking why this was used, the answer to me was “*ebwe*” (good enough). I can only respond to this insomuch as it was my hope and understanding that the trainees would see the various idiosyncrasies of this canoe as a learning and thinking process to make up their own minds as to the quality of their own workmanship.



II. CANOE BUILDING

a. Jedkã (Selecting logs)



The word *Jedkã* is used in the first two of the canoe building processes. When the builders and apprentices first search for canoe building logs and when they are actually selecting the best logs for each canoe part from a bundle or bundles of logs that have already been cut and delivered. So keep in mind that when selecting logs, each log is selected from different locations on an island depending on the size and curvature needed. For example, if logs or woods are needed for the *Apet* (primary

outrigger booms) or the *Kie* (secondary outrigger booms), the master builder will most likely go to the windward side of the atoll. And as they go toward the leeward side of the island, the straighter the logs they find. In the olden days, when the log or logs are selected, the master and his apprentices study the log. At this stage the log is still too big to carry to the building site, so the process would be to measure and cut down to raw shape. The master builder would lay and *ekkwai* from one end of the log to the other end, making sure the good wood is within the $\frac{3}{4}$ of the *ekkwai*. They do this process to ensure there will be enough good wood for the part or parts they need, in most cases the primary part always the *jouj* or the bottom of the hull. This first process is called *Tibilomar* (If you break the word into three sections you would have *tib* meaning to cut; *ilo* meaning inside and *mar* meaning inland or bushes, hence to chop a tree in the forest). Another term used for this process is called *Bõlekdik*.



In this case, the canoe building site was the WAM program, and of course with the availability delivery truck, the *Tibilomar* process was skipped.



b. Jōk Wa Eo (Building of the canoe)

In the olden days, the process of building each part of the canoe was very time consuming, and this was mainly because of the tools and of course the continuous sharpening process of each tool. All tools were made out of *Kapoor* (giant clam) or *Ajaj* (solid piece of the reef). So every four or five times the builder chopped on the log the tool needed to be sharpened again. Re-sharpening tools is a process in itself. Somebody had to unlash the stone, pass the stone to the next guy and give it to the sharpener, and then pass it on to the next guy to re-lash it and give back to the builder. This process continued from sun up to sun down. Of course, over hundreds of years ago, the European Whalers visited the RMI, and with them they brought the steel lipped adzes which replaced the old stone adzes. The builders today still use these steel lipped adzes that were brought in by the whalers. The WAM program has been lucky to have acquired such tools from tool collectors in the US and Europe.



Trainers are chopping down the logs before shaping them into hull and other parts

i. Jouj eo

The *jouj* is the foundation or the bottom part of the hull, and it usually built solid on the *kōrkōk* (small size paddling canoe that carries up to 2 or 3 people), and the *tipñōl* (Mid-size sailing canoes) size canoes. When logs are available, the *jouj* on the *walap* (large voyaging canoes) are built solid, but otherwise built in sections. The *jouj*, which means kindness, was considered *jouj* because she carries the whole canoe and the cargo wherever the voyage takes them. The *keen wa* comprised of three main section, the *jouj* (the foundation), the *jim* (the bows/sterns), and the *mej* or the *rā* (the planks). To shape the hull, the builder marks the hull into 8 sections, which are called *rakwōj*. These sections are marked so both ends of the hull are the same size. So the middle of the canoe is called *mejenanij* (eyes of God), it is believed that it was called this because it watches over the canoe. Second section is called *bejōñ* (bird chest because it shape like it), next is the *rakwōjlap* (the big section/shape), the next is the *rakwōjdik* (the small section/shape), next one is *jōrjōr* (A point on the hull of the outrigger canoe where the bottom of the hull takes a sharp turn upward toward the bow. There are two measurement techniques that the masters used for the *keen wa*, one is the measurement of the *Allok* (the five measurement of the depth of the hull; 1. *mwijitbok*; 2. *taburur*; 3. *mālmel*; 4. *tojeik*; 5. *jekad*), and the *Nok* (the layout of the *jim* or bow/stern of the canoe). First of all the *Allok*. The master builder usually selects the depth of the hull according to the beach or the lagoon that the canoe will mostly be used. For example, the canoes from Ebon are mostly *mwijitbok* because there are a lot of shallow coral heads and beaches in Ebon. And most canoes in Likiep are *taburbur* because Likiep has a deep lagoon and the beaches there have sudden drop into deep water. Secondly, the *Nok* techniques are mainly a master builders' signature. If the canoe will sail in choppy waters, the bows are designed to cut through more than one wave at a time. In this case, the *jouj* was a solid piece, the *jims* were also solid, and the planks were few pieces sewed together.



Trainee is putting the last touch of paint on the Kubaak

the *apet* (secondary outrigger booms). These booms in most cases, one end lashed from the *retam* (windward side of the hull) of the hull and the other end lashed to the *ae*. Other booms laying parallel to the *apet* are the *kie*. The *kie* does not lash to the *kubaak*. On top of the *ere*, straight above the *kubaak*, toward the *retam* side of the hull lays all the *jojo* (1. Flying fish, family EXOCOETIDAE. 2. The outrigger lift lashed to the *kie* directly over the *kubaak*), *tarwak* (Crosspieces lashed to the *kie* between the *mweiur lon* and the *jojo*, for tying the *to-kubaak* (shrouds), *kedrikdrik*, *kuro jalto*, and the *pōtak*.

ii. Ere eo or Kein Ioon Ere (Literal translation: Things on top of the *ere*. Referring to the canoe, this refers to the slats of the secondary platform which are lashed to the *kie* and *apet* approximately mid-way from the outer rail (*kuro jalto*) of the main platform (*potak*) to the first shroud crosspiece (*tarwak*). The *Ere* is the part of the canoe that starts from the *ae* of the *kubaak* all the way to the *keja* side of the *keen wa* or the hull. This whole section was comprised of booms, slats, and platforms lashed together. Let's start from the *kubaak* (outrigger float). Lashed to the *ae* or the elevated mid-section of the *kubaak* are



Beautifully done layout of the Kein ioon ere



Lashing of the Apet or the secondary outrigger boom to the outrigger float.



Ino in lejrōñ (unique square lashing) on the kein ioon ere. Notice all lashing line are Ekkwal or coconut sennit.



Trainees working on a kubaak (outrigger float)

iii. *Kubaak eo*

The *kubaak* is the outrigger float. Most of the time, the *kubaak* is built out of breadfruit wood. Building the *kubaak* seems simple, but it takes skills and patience. First the builder must pick the right breadfruit tree, keeping in mind that some trees don't float well. Secondly, there is a curing process which usually takes up to 3 months.

The length of a *kubaak* is the same distance between the *wajadik jōrjōj* to *wjablap jōrjōr*. The shape of the *kubaak* is different from one design to the next. Similar to the hull, the builder uses the *rakwōj* technique to section the *kubaak* to make sure both ends of the *kubaak* are the same. Once the *kubaak* is completed, it is aligned parallel to the side the hull right under the *apet* where it'll be lashed to the *apet*. At this time a process called *arto-artak* (aligning) takes place to make sure the *kubaak* is lashed straight in place.



Assistant Trainer is working with trainee on a canoe model

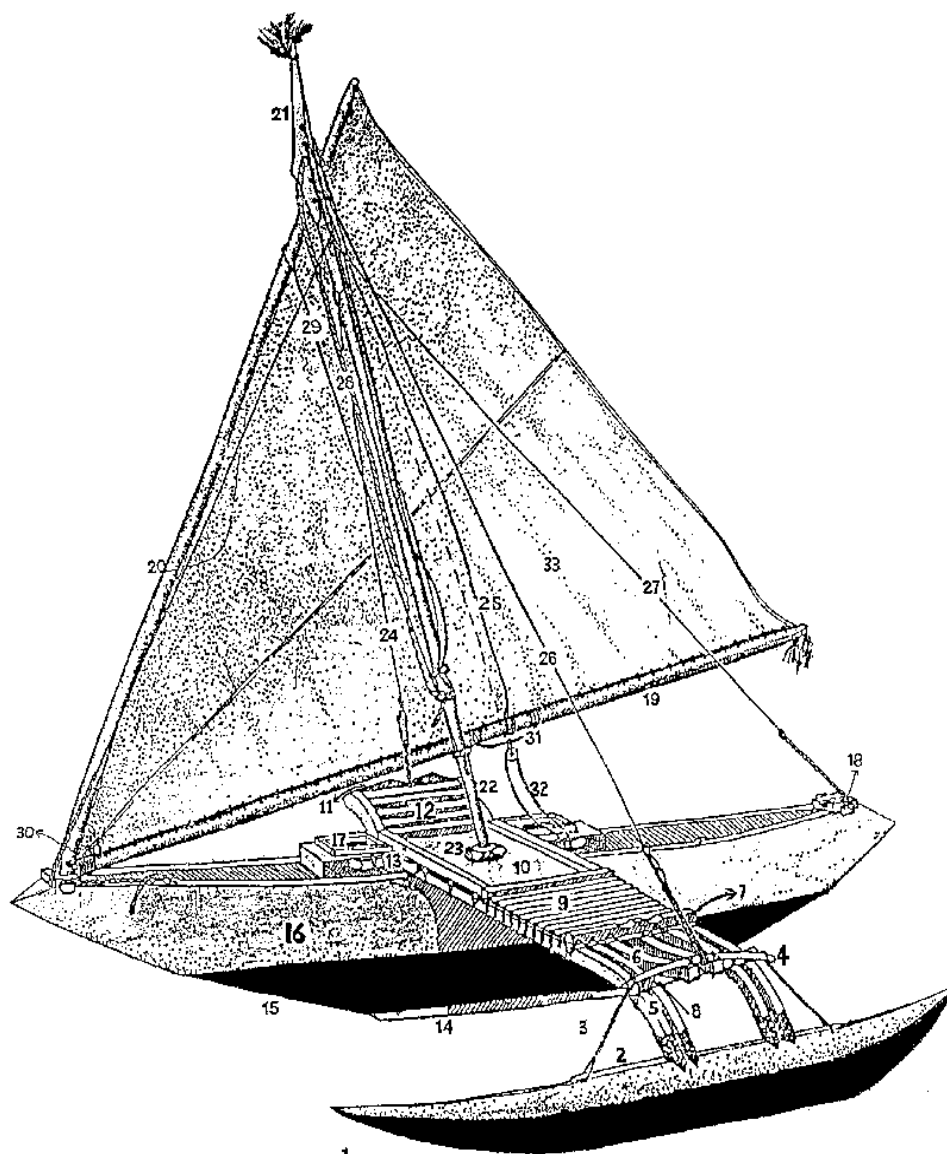
c. *Eout Wa Ko* (lashing the canoe parts): Traditionally all the parts of the canoe are lashed with *Ekkwal* (coconut twine), and in the past WAM did offer *ekkwāl*-making training. WAM has actually documented this process for future training. This process takes up to 2-3 months, time that WAM did not have for before the PIF. For this reason, WAM acquired *ekkwāl* from the other islands. Marshallese traditional lashing techniques are very unique in the Pacific, and each part is lashed differently according to their uses. Each trainee had to learn these techniques because they also use them when lashing the canoe models.



Trainee is lashing the keion ere or outrigger complex



Trainee is cleaning the lashing on the hull of the canoe model



- | | | |
|-------------------|----------------------|----------------------|
| 1. Kubaak | 12. Roñ | 23. Böklap |
| 2. Ae | 13. Jirukili/Kilkili | 24. Toon roñ |
| 3. Kabøj | 14. Erer/Mal | 25. Tiliej |
| 4. Jojo | 15. Jouj | 26. To kubaak |
| 5. Apet | 16. Mej | 27. Jomur |
| 6. Kie | 17. Boor aj | 28. Maan |
| 7. Mwejur lõñ | 18. Depakaak | 29. Jelllikok/keplik |
| 8. Mwejur lal | 19. Rojak kõrā | 30. Kõpālpel |
| 9. Kein ioon ere | 20. Rojak maan | 31. Iep lik |
| 10. Ere | 21. Lot | 32. Iep/toon iep |
| 11. Kein maan roñ | 22. Kiju | 33. Ujelā |

GLOSSARY OF MARSHALLESE WORDS⁸

Ae: Literal translation: The ocean current; at the top of the *kubaak* from *bejōñ* to *bejōñ* is a raised platform where the *apet* are placed to be lashed.

Ait: The term for laying out the width of the very bottom of the canoe hull.

Aō in kijidik: Literal translation: Swimming like a mouse. The lojidamal station line on the *kubaak* takes this name to represent the ripples the *kubaak* makes as it skims over the water, resembling the same soft ripples that a mouse would make when swimming. A skilled Marshallese sailor can keep the sail in such trim to keep the *kubaak* just barely touching the top of the water.

Apet: Secondary outrigger booms.

Apet meto: Literal translation: *Apet* on the ocean. This refers to the pointed taper carved into the ends of the raised platform on the *kubaak* where the outside *apet* are lashed. These are the first *apet* the water hits while sailing.

Ar: Traditional measuring technique; the width of a finger. Usually 0.75 in (1.9cm).

Arelōñ (Kwōj dik – Ratak chain): The back (leech) of the sail.

Arto artak: Aligning the *kubaak* to the main hull.

Bakur: Side rails of the main outrigger platform (*pōtak*).

Bakutu: The horizontal staging built from the forked stems of the Pandanus tree, laid in such a way that the heavy stem piece can be slid in and out of place while fitting it to the *jouj*.

Bewa: Staging for the *jouj* made from coconut logs.

Bein roñ: Foundation framing for the lee platform.

Bejōñ (Malmal – Ratak chain): One of the station lines on the hull, between the *mejanij* and the *rokwōjdik*.

Bien jim: The inner top of the *jim*.

Bōlbōl: In laying out the design shape of the canoe, this is the process of fine-tuning.

Bōklap: The mast step.

Bōlekdik: Literal translation: Small leaves. When the log is found either out in the bush or on another island and is too heavy to bring to the place where it will be built, this term is used to rough shape the log to make it light enough to transport. Another term used is *tibe ilo mar*.

Bubu: A knot in a line of *ekkwāl* to mark a spot to make a measurement.

⁸ NOTE: This glossary is an updated copy of the original glossary that was compiled by the documentation project “Waan Aelōñ Kein” or Canoes of these Islands. This project was under the auspices of the Alele Museum.

Bûddik: The primary rough shaping of any part of the canoe.

Bwã: Literal translation: The hard shell like cover, which protects the chest of the turtle. The shelf piece left solid as the planks are shaped so that the two main outrigger booms (*kie*) can sit securely in place on top of them and lashed through holes drilled on each side, through the *bwã*.

Bwjj: Upright supports between the *kubaak* and the *kie*.

Debwel: Cleats lashed to the lower part of the mast, usually made from *kõñe* wood so that the *tiliej* and *maan* can be secured.

Denjenbat: Literal translation: To slap the smoke away. A style of *kubaak*.

Deñlok: Literal translation: To slap something or someone refers to this style of *kubaak*, which supposedly was shaped in such a way that it would slap the waves away from the canoe.

Dipakaak: Boom step for the *rojak-maan*.

Diak: To tack the canoe, that is, to change direction of sailing 180°.

Aebõke: The final shape of the bottom of the *jouj*.

Ekkwal: Coir fiber rope made from the husk of the coconut.

Eoeo: The general term used for the lashings of the canoe.

Eo in kõjjel: Knots tied in the ends of a line for measuring from both ends of the canoe and from center to end in order to make both ends the same shape from the middle.

Eolap: Middle; center

Eoti: The action of *eoeo*, or lashing.

Eljor: In fitting two pieces of wood, the act of cutting the gap as both pieces are laid together.

Elmakwõt: Temporary lashings for tying canoe pieces together to allow finish shaping.

Em: Lashing which ties the parts of the main hull together.

Ere: The entire outrigger complex consisting of all of the parts from the *retam* side of the main hull to the *kubaak*, which are lashed to the *kie* and *apet*.

Errer: The sacrificial hardwood keel piece sewn to the bottom middle section of the hull to save to bottom of the hull from being torn away when the canoe is launched and brought to shore.

Erran: This term is commonly used throughout the Marshall Islands, although it is a *Ratak* term. A traditional marker made by burning the dried husk of the coconut just enough to make carbon. Water is poured over the husk when it is taken from the fire so the black will rub easily on the wood.

Etto: Ancient times.

Iep: The line known as the mainsail sheet which adjusts the angle of the sail in reference to wind direction and the course the canoe.

Ieplik: A lashing in the center of the *rojak kõrã* where the mainsail sheet (*iep*) block is tied.

Ino: For certain parts of the canoe this is the common term used for lashing.

Ino in depin apet: Literal translation: Lashing of the *apet*. Common term for lashing the *apet* onto the *kubaak*.

Ino in rewa: Lashing which connects the secondary outrigger booms (*apet*) to the outrigger float (*kubaak*). *Rewa* refers to two canoes ramming each other during battle. The lashing was developed to lower the chance of the canoe coming apart. It is thought to be the strongest lashing for this application.

Ino in learn: Lashing, which connects *mweiur lal* to outer *apet*. *Lejron* is a term used for a woman who likes to show off her beauty. When the man has the beauty of this woman in his heart it is very hard to get her out. Hence the name, referring to the lashing which is strong and hard to take apart. It is a very beautiful lashing.

Ino lep: Lashes *mweiur lal* to *kie*.

Ino kutileik: General term for all of the lashings from the *ubôn wôn* to the *jojo*.

Ino mej: Literal translation: The lashing of the eye. This is the place at the top of the *jouj* where the planking is lashed.

Iumwin-jouj: The bottom of the *jouj* log.

Jakaibo: Made from the scrapings of the aerial root of the Pandanus tree (*liok*), a caulking driven into the lashing holes in the hull of the canoe to prevent water from leaking into the canoe.

Japdik: The name of one end of the canoe; facing the outrigger float from the main hull, the *japdik* end of the canoe is to the left.

Japlap: The name of one end of the canoe; facing the outrigger float from the main hull, the *japlap* end of the canoe is to the right.

Jebañdrik: Literal translation: Little helper. This paddle is used to help stabilize the steering paddle (*Jûburen ae*) of the canoe.

Jebed: Traditional measuring technique; while the hand is laid palm down and with fingers and thumb together, this distance is taken from outside of thumb to outside of palm usually between 4-5 in (10-12cm). If one checks, this distance is always the same width as the side of the face.

Jekad: The deepest of five recognized hull designs of the Marshallese outrigger canoe. The *Jekad* is the black noddy (*Anous tenuirostris*), a bird that lives most of the time on the water.

Jerakrôk: Sailing.

Jeneel: A planking piece to fill a smaller space, which would not be filled with the main, larger plank.

Jepooj: The cornet fish; *FISTULARIA PETIMBA*. A style of *kubaak* built for racing.

Jidjid: A long cylinder shaped tool for pounding the *bweô* in preparation for making *ekkwâl*.

Jôtan: Traditional measuring technique; with the hand flat, fingers and thumb spread open-palm down, the distance between the end of the thumb and the end of the middle finger. Depending on the size of the builder's hand, this could be a distance between 6 in (15cm) and 9 in (23cm). In general, though, it would be more likely to be between 6 in (15cm) and 7 in (18cm) due to the smaller size of the Marshallese hand as compared to that of a Europeans.

Jim: At both ends of the canoe, similar in function to the stem of a European wooden vessel, the wooden bow/stern piece sitting on and fastened to the bottom *jouj* section where the ends of the planking is likewise fastened.

Jinen wa: Literal translation: Mother of the canoe. There are special parts of the canoe, which are held with a special, almost spiritual understanding as their relationship to the sailor and the canoe. These parts are the *matatip*, *Jûburen ae*, *lem* and *iep*.

Jirukli: Cleats lashed to the *retam* side of the hull for the main sheet.

Jõbwe: All types of canoe paddles. In Ujae there are three: 1. *Jõbwe in aõnõn*. 2. *Jebañdrik*. 3. *Jûburen ae*.

Jõbwe in aõnõn: Canoe paddle used to paddle the canoe. *tûbe ilo mar*.

Jojo: 1. Flying fish, family EXOCOETIDAE. 2. The outrigger lift lashed to the *kie* directly over the *kubaak*.

Jõrjõr: A point on the hull of the outrigger canoe where the bottom of the hull takes a sharp turn upward toward the bow.

Jouj: Literal translation: Kind. The bottom section of the canoe, named because it carries the weight of all of the other parts of the canoe, which are built on the top of it. Also, by carrying the weight of all of the other parts, it also is instrumental in carrying people, food and supplies needed for everyday existence.

Jûburen ae: The main steering paddle for the canoe.

Juloñ: Digging out the inside of the hull.

Jurõn okme: The two forked branches, which are driven into the ground supporting a wooden crosspiece, which support the *kie*, temporarily where they will sit over the *kubaak* so they can be lashed in place at the hull.

Kabõj: The lashing, which ties the ends of the *jojo* to the top of the *kubaak*, acting as a shock absorber as the canoe is under sail allowing the *kubaak* to flex independently of the main hull. The reef heron, EGRETTE SACRA.

Kabin bõran noniep: Literal translation: The back of the head of the demon. One version of the shape at the end of the *jim*. In pre-missionary times, it was common that the *Iroi*j (chief) were knowledgeable in many of the arts of traditional knowledge. Of course, one was canoe building. Of course there were also commoners knowledgeable in building the canoe. The shape at the end of the canoe is a very important aspect of "signature" of a builder. As an example, if the end piece of the canoe was much better shaped than that of a chiefs handiwork, many times, that chief would have that commoner put to death. As custom dictates, the people of Ujae named the shape this so that there would be no mistaking the builder's expertise being better than that of the chiefs.

Kabin jouj: Literal translation: Bottom of the *jouj*. This term refers to the lengthwise center-line laid out at the bottom of the *jouj* during the shaping process.

Kadmej: Process of pounding the *jakaibo* into the lashing holes.

Kõja: The flat side of the asymmetric hull which is to leeward, that is, away from the direction of the wind.

Kakûñkûñ: Literal translation: A smelly place. Place on the canoe where the sailor defecates.

Kajijjõt in jim: Literally means where the *jim* sits.

Kādrīkdrik: The secondary platform crosspieces, located from the edge of the primary platform to the *mweiur lōñ*. The word *kūñkūñ* refers to the smell from human excrement. The term for this canoe part came about because at that area of the canoe is where the sailors went to the bathroom.

Kōpālpel: Area where the two sail booms are lashed together.

Kattok: A hardwood wedge driven in the temporary lashings for the planks so that the planks will be especially tight in order to do the final lashing.

Kein alej: Literal translation: Something to aim with. A distancing/measuring tool used to transfer the shape of one line to another, made from the middle spine of the coconut leaf (*melwe*). ex: Fitting plank edge to plank edge.

Kein ioon ere: Literal translation: Things on top of the *ere*. Referring to the canoe, this refers to the slats of the secondary platform, which are lashed to the *kie* and *apet* approximately mid-way from the outer rail (*kūro jalto*) of the main platform (*pōtak*) to the first shroud crosspiece (*tarwak*).

Kein maan jim: One version of the shape at the end of the *jim*.

Kein maan roñ: The two outer beams, which support the frame structure forming the lee platform (*roñ*).

Kie: Primary outrigger boom.

Kiju: The mast.

Ko: The bulkhead/frames inside the main hull, which the planking is lashed to in order to maintain the shape and integrity of the hull.

Kōdo: Literal translation: cloud. A bulwark lashed to top plank on the *keja* side of the hull, which acts as a support beam for the lee platform (*kein maan roñ*).

Kōpālpel: The area where the two booms are lashed together.

Kōrkōr: A small rowing canoe.

Kōtkōt mejenrom: Literal translation: Blinking eyes. The shortest design length of the *ere*, enabling the *kubaak* to lift out of the water, making the sailor to remain “always alert”.

Kubaak: The outrigger float.

Kūbed: The old term for canoe paddle. Today the term *jōbwe* is used.

Kūbedbed: In the half-breadth view and on the *keja*, or leeward side of the hull, the *kūbedbed* is the concave shape in the bottom section of the canoe.

Kōbñur: The regular design length of the *ere*, enabling the canoe to sail easily on a straight tack.

Kūllik: Literal translation: the skin of the back. An extra amount of wood left on the *keja* side of the while carving and shaping it. The wood sticks out over the side of the hull so that when the canoe has lateral drift in shallow waters and is scraped on the rocks of the reef, the *erer* takes the brunt of the scraping instead of the side of the hull.

Kūro jalto: The outside rail of the primary outrigger platform (*pōtak*).

Kwal aidik: The smallest size of coconut coir, usually 1/16 in-1/8 in (0.3cm) or slightly larger in diameter.

Kwal aelep: Coconut coir made larger than *kwal airik*, up to 3/8 in (1cm) in diameter. Made from the shorter thicker fibers of the *bweô*.

Kwal jil: Largest of the three sizes of coconut coir made by twisting three strands of *kwal aelep* together. many times up to 3/4 in (1.9cm).

Kwôjak: Tying the sail to the booms.

Lebout: The process of wrapping the loose end of the lashing line, threading and tightening it around itself.

Likwôn wa: A general term for the center of any vehicle (*wa*).

Liok: The aerial root of the Pandanus tree.

Liwetak: Literal translation: *Li*, referring to the canoe as feminine, similar to the English synonym referring to a boat as “her” or “she”. *Wetak* refers to sailing into the wind. *Liwetak* is the longest design length of the *ere*, tending to pull the canoe into the wind with the weight of the *kubaak*.

Elôko or Lloko: The lashing, which ties the primary outrigger boom to the main hull shelf (*bwã*).

Lobal: From the middle to the end of the booms where they are tied together.

Lojidamal: One of the station lines on the hull, between the *rokwôjdik* and the *Jôrjôr*.

Lot: The mast top, usually made from a piece of hardwood lashed to the upper section of the mast, which acts as a block for the main sail hoist line (*maan*) and spiller lines (*tiliej*).

Ma: Breadfruit tree and fruit.

Maan: Lines, which raise and lower the sail.

Maañ in bob: Pandanus leaf.

Maan wa: The end of the canoe.

Makwôj: Traditional measuring technique: the distance of the first joint to the end of the index finger. Usually 1 in (2.5cm).

Mâlmel: The middle design of the five recognized designs of the Marshallese outrigger canoe.

Matatip: In the bottom section of the canoe hull, approximately a quarter of the way from both ends and at the middle, a section of wood is left solid while hollowing out the hull. This creates strength and integrity of the lower hull section much like a floor beam does in a European style wooden vessel.

Mej: Literal translation: the eye. In building the canoe, the top of the *jouj* where the planking is lashed to is known as the *mej*. You might compare it to the way Americans refer to the top of a drum or barrel as the “lip”.

Mejanij: Literal translation: The eyes of God. Remember, the term God is new in the Marshallese language, which traditionally would be considered the spirit. The end-to-end centerline of the canoe, first lay in when the *jouj* is made. This is the master station line for all measurements of all parts, which are located on the canoe throughout the construction process. When the construction is completed, there is a special lashing put in this spot to always show the center of the canoe. An old belief is that when the sailors run out of fresh water during a voyage they will always be able to suck fresh water from the *mejanij*, believing that fresh water will always be there and that God is always watching over them.

Melwe: Literal translation: belt. The middle, main stem of the coconut leaf.

Mweiur: Crosspiece between the *apet* and *kie* which acts as a leveler for the canoe as well as a strengthening member for the lashing of the *kie* and *apet*. It is also the crosspiece, which sits on the two *Jurōn okme* to hold the *kie* temporarily in place.

Mwijitbok: Literal translation for this term *mwijit* (to cut) and *bok* (sand). One of five recognized designs of the Marshallese outrigger canoe. This is the shallowest and first design and gets the name because it can sail in the shallows and was a "sandcutter".

Ñadñad: The waterline of the main hull.

Ne: Literal translation: foot. Traditional Marshallese measurement. With both hands laying flat with finger and thumbs extended, and with the ends of the thumbs touching each other, the distance from outer palm to outer equals one *ne*, or approximately one foot.

Ñeñe: Traditional measurement of a double arms length equaling approximately 6 ft (2m) or one fathom.

No: Waves

Nok: 1. To lay out the shape of the *jim* with the *maan* and *ekkwat* so it will fit onto the *jouj*. 2. The spine of the leaf of the coconut.

Pej: The eaten, discarded and dried fruit of the Pandanus used as a natural brush for applying oil, glue or paint

Pōtak: Main outrigger platform.

Rā: The planking of the hull.

Rālik: Western or sunset chain of islands in the Marshall Islands, running north to south.

Ratak: Eastern or sunrise chain of islands in the Marshall Islands, running north to south.

Rātam: The rounded side of the asymmetric hull, which is to windward, that is, facing the direction of the wind.

Rokwōjdik: One of the station lines on the hull, between the *rokwōjlap* and the *lojidamal*.

Rokwōjlap (Wāmeto – Ratak chain): One of the station lines on the hull, between the *bejōñ* and the *rokwōjdik*.

Rojak-kōrā: The lower sail boom. *Kōrā* is a woman.

Rojak-maan: The upper sail boom, sometimes referred to as a yard in English terms. *Maan* is a man.

Roñ: 1. The lee platform extending over the mid-section of the hull where the crew sits while under sail. 2. The generic term for a hole of any kind. Referring to the construction of a canoe, it is the hole drilled in the parts for lashing.

Roñ in apet: Hole cut in the top of the *kubaak* for the lashing of the *apet*.

Roro: Special chants used for specific purposes to embellish the act which is taking place; ex. chopping on the hull; launching the canoe, bringing the canoe to shore, etc.

Taburbur: The second to the shallowest of five recognized designs of the Marshallese outrigger canoe.

Tarwak: Crosspieces lashed to the *kie* between the *mweiur lõñ* and the *jojo*, for tying the *to-kubaak* (shrouds) to.

Tiliej: Reefing lines, which spill the wind from the sail in heavy weather by raising the lower boom, also keeping the sail directly over the boom while raising and lowering.

Tipñōl: A mid-size sailing canoe.

Tip: Each layer of wood chopped away while shaping the hull.

To in jomur: Staying lines, which hold the mast in the forward and aft position.

Tojeik: The second to the deepest of the five recognized designs of the Marshallese outrigger canoe.

To kubaak: Standing rigging line from the upper portion of the mast to the outer portion of the outrigger, which holds the mast and sail in place against the force of the wind. Shrouds.

Tûar: A piece of wood, which tie the top plank and the *jim* together. It is always placed on the *keja*, or leeward side.

Tûbilomar: Literal translation: If you break the word into three sections you would have *tib* meaning to cut; *ilo* meaning inside and *mar* meaning inland or bushes, hence to chop a tree in the forest. When the log is found either out in the bush or on another island and is too heavy to bring to the place where it will be built, this term is used to rough shape the log to make it light enough to transport. Another term used is *bôlekdik*.

Turkie: The middle *apet*.

Ubaeno: Literal translation: The chest of the waves. Literal interpretation: The shield from the waves. A piece of wood, which ties the top plank and the *jim* together strengthening the integrity of the hull. It is always placed at the *retam*, or windward side and is usually quite a bit longer than the *tûar* as this side of the hull gets more of a beating.

Ubōn kãār: Literal translation: Chest of the black-napped tern, STERNA SUMATRANA. On all tools which are hand sharpened, such as the adze, machete and chisel, for example, the area from where the tip passes the bevel to the flat part of the blade is known as the *ubōn kãār* because of the resemblance of the chest shape.

Ubōn wōn: Literal translation: Chest of the turtle. A bulwark lashed to top plank on the *retam* side of the hull, which acts as a support beam for the planks of the Main platform (*pōtak*) as well as a splashguard for water coming over the side into the hull. If you take a picture of an outrigger canoe hull and turn it upside down, it surprisingly looks like a turtle.

Ujlā: The sail.

Wa: In pre-colonial times the only vehicle known was the canoe called *wa*. Since the colonization of the islands the names for all vehicles remained *wa*.

Wajabdik: When facing the hull from the *kubaak*, the name of the end of the canoe that is to the right. If you separate this word into three sections, *wa* is the canoe; *jab* refers to a side, and *dik* is small. Thomas explains this by saying that this side of the canoe is the first to visibly get smaller as it sails away. Also the second *apet* on this side.

Wajablap: When facing the hull from the *kubaak*, the name of the end of the canoe that is to the left. If you separate this word into three sections, *wa* is the canoe; *jab* refers to a side, and *lap* is big. Thomas

explains this by saying that this side of the canoe is the first to visibly get bigger as it sails in toward shore. Also the second *apet* on this side.

Walap: A large voyaging canoe.

Wetak: When the canoe pulls into the wind under sail.

Weto: When the canoe pulls away from the wind under sail.