Palauan Canoe-Building:

Building the midsection of a *Kabekl* Canoe

By

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Introduction

This paper will describe Palau's *kabekl* traditional canoe-building concentrating on the midsection area of canoe including the captain's chair, deck area, and the outrigger assembly.

Palau is composed of approximately nine major inhabited islands and more than 700 islets stretching 435 miles from Kayangel Islands in the north to Helen Reef in the south. The archipelago consists of four high islands including Babeldaob, Koror, Peleliu, and Angaur, two low coral atolls including Kayangel and Ngeruangel Atoll, and the famous limestone rock islands. In addition, there are six isolated islands called Southwest Islands approximately 211-372 miles southwest of Koror including the islands of Helen Reef, Tobi, Merir, Pulo Anna, Sonsorol, and Fana.

Although Palauans had paddling and sailing canoes, Palauans did not venture beyond coastal navigation. The canoes were used mostly to visit foreign ships off the East coast outside the barrier reef or to sail from one island to another especially to reach Kayangel in the North or Angaur in the South (Kramer, 1926). Canoes were very useful in Palau in the old days. They were used for fishing, sailing from one village to another, transporting cargo, trading and relaying messages, and for inter-village warfare. At times, the canoes were also used for sports events like sailing and paddling races.

There are five types of canoes in Palau. There is the *kaeb* (for sailing and racing), *kabekl* (for warfare), *borotong* (for fishing and carrying cargo), *koteraol* (for carrying cargo), and *mlai ra bul* (Southwest Islands canoe). The most spectacular looking canoe is the war canoe called *kabekl*. This is usually colored in dark red and decorated with white designs and hanging cowrie shells. This canoe was considered the pride of the village. (Vitarelli, p. 11)

Building a canoe was an important task and had many stages including selecting and cutting the tree, hewing the tree (rough carving of the hull), hauling the hull to the canoe house, finishing carving of the hull, constructing the outrigger, painting, and launching the canoe. Many rituals were associated with the work of building the canoe. When a canoe project is planned, the proper time must be selected for each stage by consulting the stage of the moon, reciting the proper chants, and recognizing the spirits of the land and ocean to ensure success in building the canoe.

Today in Palau, canoe-building is a dying art. With the advent of outboard motorboats, the use of canoes has become obsolete. In addition, with the construction of the Babeldaob road, traveling from one state (formerly village) to another has become easier by automobile. In the early days, some areas were only accessible by boats.

Currently, there are some existing canoes in Palau built for historical or cultural preservation projects, and more importantly to try to keep the art of canoe-building alive. In fact, just this year, master canoe-builder *Ebekeu*[1] built three traditional canoes at Palau Community College's boathouse (*diangel*). These canoes are to be used to revive and perpetuate the traditional Palauan canoe-building as well as sailing skills for the Palauan Studies Curriculum. Recently, Palau Community College has offered two classes in traditional non-instrument navigation classes led by master navigator Sesario Sewralur[2]. This particular class covers additional topics like sailing techniques, water safety training, survival skills, weather prediction, as well as non-instrument navigation techniques.

[1] Palauan traditional title for men (*rubak*).
[2] Master navigator from Satawal, Yap.

Methodology

For this paper, my research methodology included resources from the Internet, books, and interviews. For Internet resources, I found some articles on canoe-building in Guam, Yap, Marshall Islands, and Hawaii. These articles provided me with details about canoe-building, descriptions of the parts of the canoe, and traditions associated with such an activity. Unfortunately, there were no articles discussing canoe-building in Palau. However, some of the text including the ones from Guam and Yap did reference canoes from Palau.

I also read some books on Palau traditions and customs. These books had general descriptions of canoes and canoe-building but not really detailed. The most helpful book I found was *Palau Volume 3* by Augustin Kramer. He was a German anthropologist who wrote about Palau's material culture and cultural life. His books are now in the process of being translated. I was fortunate that the volume that covers canoe-building has been partially translated so I was able to utilize some of this content for this research paper.

Moreover, I did a few interviews which were most helpful in putting this research project in context and gave me some practice in interviewing and writing in the Palauan language. I found out that three active canoe-builders are now living in Ngchesar in the main island of Babeldaob. The primary person I talked to was Mr. Ananias *Rechedebechei* Bultedaob. Mr. Bultedaob works at the Palau National Musuem. Fortunately, he also lives in Ngchesar with the other two canoe builders – Mr. Robat *Oltbap* Sabura who specializes also in building canoe models and a master canoe-builder, Orrukei *Ebekeu* Bukringang. I had a few interviews with Mr. Bultedaob and my final interview with all three canoe-builders in Ngchesar.

When I initially approached Mr. Bultedaob for an interview, he was very amiable. I explained the purpose of the interview and objectives of the Macimise Project, and he was more than happy to share his knowledge of canoe-building with me and supported the idea of converting this knowledge to school learning materials. I had similar reactions with the other canoe builders I interviewed.

I didn't really have a set of questions to ask during the interviews.   However, I did have a rough outline of the canoe-building process. The articles I found on the Internet, particularly the ones for Hawaiian canoe-building, gave a good outline of how to build a canoe. This sequence included cutting the main tree for the canoe, transporting the tree to the canoe house, construction of the canoe, and the painting/finishing of the canoe. Thus, the approach I took was more of a discussion then having a set of questions. For example, when I interviewed about the cutting of the tree, I asked, "What is the process of choosing and cutting the tree for the canoe?" Drawing from that discussion, I would ask more details on the size of the tree, the type of tree, and other specific details.

My initial difficulty in researching this topic was just finding written documents on Palauan canoe-building. At Palau Community College's library, there were some reference books and articles that were missing and it took me awhile to get a copy of the text of Kramer's book from the Palau National Museum Library.

I was also surprised and disappointed that no articles or references were on the Internet regarding canoe-building in Palau. However, I did discover that Palauans are more conservative in sharing their traditional knowledge and practices so such things are not normally published on the Internet.

The interviews went smoothly. The only challenge was scheduling the appointments for the interviews. I had to juggle between my work schedule and Mr. Bultedaob at the museum who also has a work schedule he had to follow. Overall, I did enjoy the interviews and looking forward to doing more in the Macimise Program.

During the research process, I always wondered if I had enough information for the research paper and for developing the math curricula. However, in one of our classes, it was mentioned that to discuss the whole process of building the canoe might be too much. Thus, I decided to concentrate on a particular part of building the canoe, particularly the deck/outrigger area. In this regard, I feel I do have enough information that I can use to develop good math curriculum materials.

For the most part, I think the research for this paper was very successful. I only wish that Kramer’s book on Palau has been translated completely so I can actually read the whole book. The excerpt from his book on building the canoe was very helpful but some pages were still not complete. In addition, some of the illustrations were missing. Again, it would have been nice to see the whole book.

As I was writing the description, I realize that I don’t really have good detail descriptions of the lashing styles. For example, lashing the outrigger booms to the transverse beams, lashing the bamboo deck, and lashing the outrigger float required different styles of tying. If I had more time, I would have researched this more.

Furthermore, hearing or reading about constructing something is not the same as actually seeing the object being built. I just wish I could have seen an actual canoe being built or better yet, given a chance to videotape such an event. This would have been an important resource for this paper as well as a historical archive material.

Description

For this research, I took pictures and measurements for two *kabekl* canoes. The *kabekl* is the traditional paddle war canoe with a single outrigger. The first one is from Ngchesar State called *Bisbusch* (“lightening”) and the second from Airai State called *Kesebekuu* (“eel”). For this discussion, I will use the dimensions of the *kabekl* canoe from *Ngchesar* State. The description will concentrate on the midsection of the canoe to the outrigger assembly (figure 1). The names and the dimensions of the parts of the midsection are in Appendix A for reference.

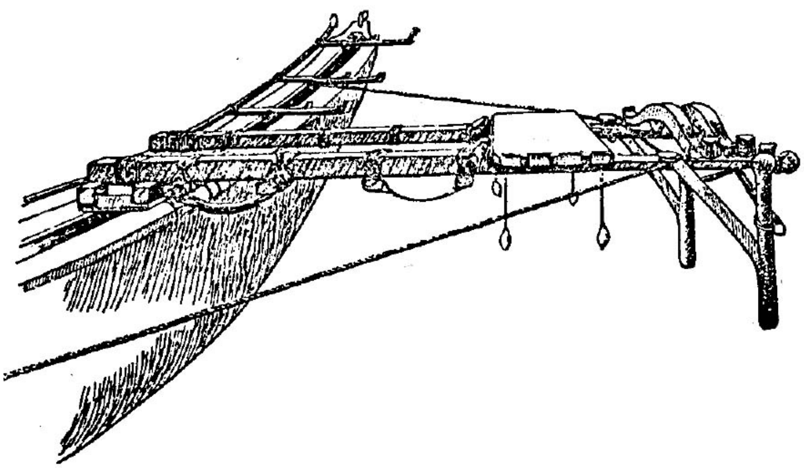

Figure 1: Midsection of canoe.
Sketch by Kramer, 1926, page 179

The midsection of the canoe is called *blu* (figure 2a), and is the Captain’s chair. This is a rectangular frame (50.5 inches by 24 inches) adjoining the deck of the canoe, opposite the outrigger. To construct the deck, we start with two lower transverse beams (*kamagarasag*) which will form the front and back foundation base for the midsection seat. These beams start as a rectangular beam, flat on top, with two triangular cutouts on the left and right side, and a slightly curved cutout in the bottom middle which will be tied by twine later (figure 2b). The beams and most of the other parts of the canoe were shaped with an adze in the old days.

Figure 2a: Captain's Chair

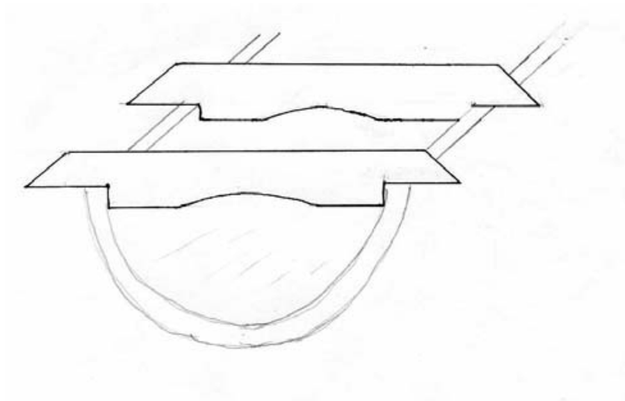

Figure 2b: Transverse beams

These transverse beams are not attached directly to the canoe, but are secured by the longitudinal beams (*goruaol*). The longitudinal beams have eight holes and two rectangular notches that hold the transverse beams in place (figure 3a). The sides are shaped again with an adze and tied in place with sennit twine called *suld*. All the lashings are made with this material of various sizes. These lashings called *goru* are extremely important. If they are cut, the canoe becomes unstable sooner or later depending on the damage. Even today, no nails or metal fastenings are used, as this would destroy the canoe's flexibility, which allows it to withstand shocks of wave and current and reef without breaking up (Robinson, 1970).

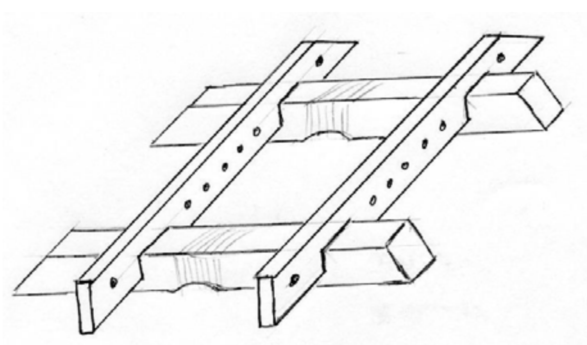

Figure 3a: Longitudinal beams

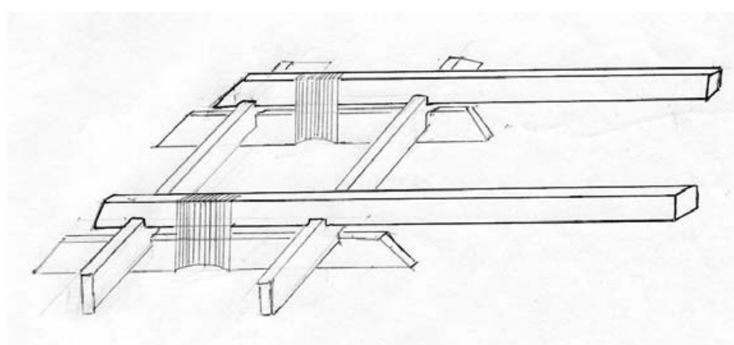

Figure 3b: booms tied to lower transverse beams

The outrigger canoe called *kabekl* consists of two outrigger booms called *soaies*. These two long transverse beams are lashed on the front and the back with the lower transverse beams (figure 3b). Since these are used to hold the outrigger assembly and lateral support for the canoe, the lashings are tied with a thicker twine as shown in figure 4a. The other end of the *soaies* holds the outrigger assembly, which will be discussed later.

Figure 4a: Lashing of transverse beams to outrigger booms.

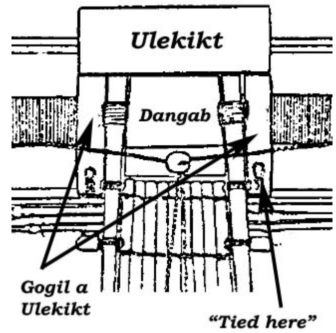

Figure 4b: Parts of chair
Sketch by Kramer, 1926, page 174

Looking at the top of the midsection, on the frame structure there is a seating plank that consists of various boards. The main central plank (*dangab*) is bordered on the left edge towards the lee side by a type of gunwale, an angular plank known as a *ulekikt* – this has been replaced by plywood when the canoe was repaired (figure 2a). Towards each end of this plank, there are two narrow boards (top transverse beams) called "the legs of *ulekikt*" or *gogil a ulekikt*. These two beams are placed next after the two outrigger booms (*soaies*) have been installed (figure 4b). The beams are tied only on the outrigger side of the canoe. A hole is made on this side and tied to a transverse stringer (figure 5a). This design allows the seating assembly to open toward the outrigger side to place cargo such as fish inside the canoe (figure 5b). Once these top transverse beams have been secured, then the angular plank (*ulekikt)* and the seating plank can be installed.

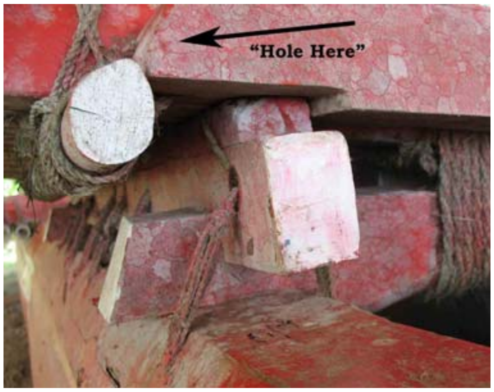

Figure 5a: Top transverse beams

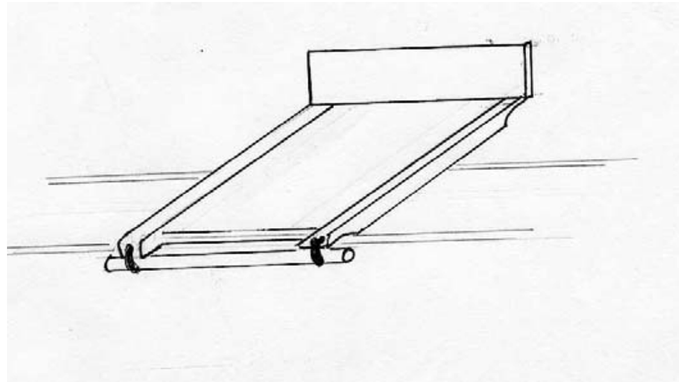

Figure 5b: Chair lifts up for cargo storage

The next stage is to secure the outrigger booms before the deck area can be constructed. The booms must be perpendicular to each other and are tied in place with 5 lateral braces called *telkau kelsokes* (figure 6a). These round poles about 1.5 to 2 inches in diameter are lashed on each end, about 10-11 inches apart. These are placed perpendicular to the booms to keep them in place and also to provide the foundation support for the bamboo deck of the canoe (figure 6b).

Figure 6a: Under the deck: lateral braces

Figure 6b: Bamboo deck of canoe (*klsokes*)

At this point in the building process, the float should be constructed because its actual dimensions will determine the length and size of the parts for the outrigger support. The *Bisbusch* float is 19 feet 8 inches long, 7.75 inches wide, and 11.5 inches tall. It is rectangular with rounded tips and removable.

The size of the outrigger float is determined by the size of the main canoe. According to canoe builder *Oltbap*, most of the canoe measurements are based on the “even system of measurement”. For example, the length of a 30-foot canoe will be divided in the middle, giving you 15 feet. The 15 feet will be further divided in the middle resulting in 7.5 feet. This as he explained will be half of the outrigger float length. The actual length of the float becomes 15 feet after doubling the 7.5 feet. However, he did add that the canoe builder might make the float shorter or longer depending on the length and width of the main canoe.

This convention as explained has a ratio of canoe length to the float length of 2:1. I did a measurement analysis for *Bisbusch* and *Kesebekuu* canoes. For *Bisbusch*, the canoe length is approximately 44 feet and the float length is approximately 20 feet giving a ratio of 2.2 to 1. For *Kesebekuu*, the canoe length is approximately 47 feet and the float length is approximately 19 feet giving a ratio of 2.5 to 1.

The outrigger float is a long, buoyant, and tiny trunk of a tree. The main canoe is usually made of breadfruit tree or *Ukall* tree (Serianthes grandiflora). The same tree maybe used for the float, but a mangrove tree called *kaiirs* is preferred because of its lightweight and buoyancy. The float is carved with both ends pointed, slightly turned up. This allows the float to skim over the water and avoid dropping into the trough as waves go by.

The purpose of the outrigger float is to keep the canoe from rolling over. The buoyancy of the float will not allow the canoe to roll in the direction of the outrigger and also the weight of the outrigger will not allow the canoe to roll in the opposite direction. While the outrigger float provides stability to the canoe, it also creates drag. Thus, a long slender float with ample buoyancy to support the load displacement on the canoe hull as well as the outrigger will give good performance. In contrast, a short float or one that does not have enough buoyancy can cause the canoe to roll easily once it is submerged in water.

Before the deck of the outrigger can be constructed, the outrigger assembly must be completed. The outrigger assembly consists of two outrigger booms, the float support (*torar*), the stanchions or pegs (*ulai*), and the float (*desomel*). Toward the outside of the deck, there is an indentation on the topside where the sitting board (*golakaskl*) is installed, see figure 7.   The sitting board is placed last, after the bamboo deck is finished.

The next step is to construct the outrigger support assembly. First, the forked supports (*ulai*) are positioned under the yoke (installed later) and lashed to the end of the outrigger booms pointing down vertically. These are two round wooden stakes that are supported on the inside and are positioned and kept in place by two crossed bars. The straight vertical side of the *ulai* will be placed inside a special round hole (*ultoatel*) in the outrigger float while the other side will be positioned toward the canoe (figure 8).

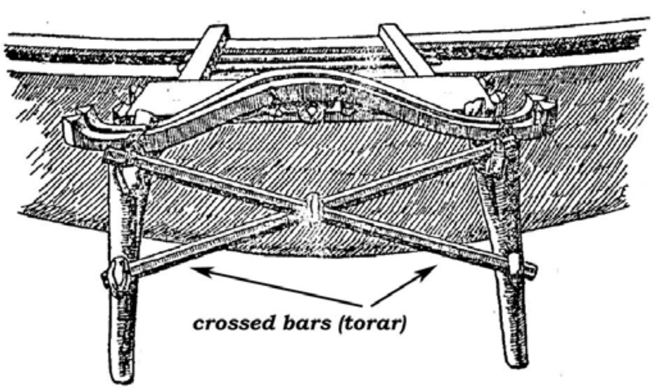

Figure 7: Outrigger Assembly
Sketch by Kramer, 1926, page 179

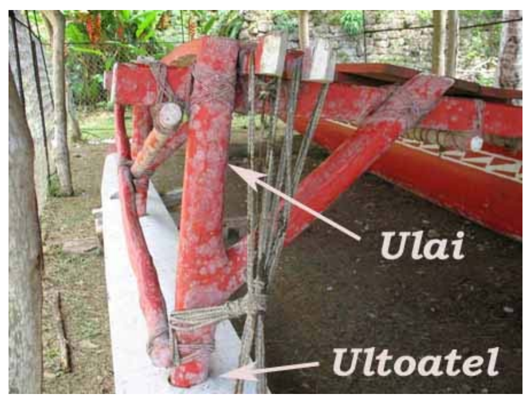

Figure 8: Vertical supports (*ulai*)

With the outrigger in place temporarily, the vertical crossed bars (*torar*) are then fastened on the left and right forked supports (figure 7). After this, the final part of the outrigger support assembly is placed. This part is the yoke (*kematal*) which holds the outrigger booms on the top as well as holds the float so that it cannot fall out of the *ulai* (figure 9). This rectangular frame has a little rainbow arch and has half-H cutout on each end. The inner end of this cutout is tied to the boom, while the outer end with an L-shape hook is used to tie and secure the outrigger float. The lashing technique to tie the yoke to the float is a little elaborate. A figure-eight tying is done from the yoke (left and right hooks) to the additional holes in the float called *golotoangel*. Once this is done, an additional tie grips the float lashing to the *ulai* support for added support.

Figure 9: The yoke (*kematal*)

Figure 10: Seating board (*golakaskl*)

The outrigger support assembly is now done with the outrigger float secured, and at this point the canoe-builder completes the deck. The deck is made of bamboo strips about 1.5-2.0 inches wide and 36 inches long. The bamboo strips are tied to the lateral braces (*telkau klsokes*). The lashing technique is like a sewing pattern that goes up and transverse across the bamboo, down to the lateral brace and around it, and up to the bamboo strip again. The tension on the twine must be strong and maintained to hold the bamboo strips in place (figure 6).

The final piece of the canoe deck is the seating board (figure 10). This plank is usually fastened with twine. However, in this picture it has been replaced and nailed down when the canoe was repaired.

Finally, the completed outrigger assembly with the float, deck, and the captain's chair is done as shown below – *Bisbusch* on the left and *Kesebekuu* on the right (figure 11a and 11b).

figure 11a: *Bisbusch* (lightening) from Ngchesar State

figure 11b: *Kesebekuu* (eel) from Airai State

Note: All photos and sketches were taken or created by me unless otherwise attributed.

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Bukringang, Orrukei *Ebekeu*, male, age 91, Ngchesar State, Master Canoe Builder.

Personal interview on canoe building, Ngchesar, Palau on 21 March 2010.

Appendix A: Outrigger Canoe Midsection Components for *Bisbusch Kabekl*

	Part of Canoe	Palauan Name	Dimensions (inches)
Midsection (Chair section)	Captain's chair	*blu*	50.5" x 24"
	Lower transverse beams (pair)	*kamagarasag*	23" x 3.5" x 2.5"
	Longitudinal beams (pair)	*goruaol*	50.5" x 1.75" x 2.75"
	Outrigger booms (pair)	*soaies*	106" x 3" x 2.5", 8' 10" length
	Top transverse beams (pair)	*gogil a ulekikt* *"legs of ulekikt"*	24" x 3.5" x 2.5"
	Central seating plank	*Dangab*	37" x 18"
	Angular plank	*Ulekikt*	50" x 4.5" x 3.5"
Outrigger assembly	Outrigger booms (pair)- same above		
	Cross float support (pair)	*Torar*	53.5" height/ 4.5" girth
	Stanchions or pegs (pair)	*Ulai*	24" vertical length/ 8.5" girth
	Yoke	*kematal*	57" x 4.75" x 1.5"
	Outrigger float	*Desomel*	236" x 7.75" x 11.5" , 19' 8" length
Deck assembly	Outrigger booms (pair)- same above		
	Sitting board	*Golakaskl*	50.5" x 24"
	Lateral braces (5 pieces)	*Telkau klsokes*	47" length/ 6.5" girth
	Bamboo Strips (1.5" x 61" each)	*Klsokes (deck)*	61" x 38" bamboo deck area
Others	Sennit twine	*suld*	Various lengths and thickness
	Lashings (ties)	*goru*	Various tying styles

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