

PRESERVING THE ENDURING KNOWLEDGE OF TRADITIONAL NAVIGATION AND CANOE BUILDING IN YAP, FSM

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*The best inspiration I got for Avatar 2 and 3
was dealing with the master navigator
culture in Micronesia.*

—James Cameron¹

INTRODUCTION

The collection of high islands and atolls within the Caroline Island group of Micronesia is home to cultural traditions that have endured for thousands of years. One such form of wisdom that was no doubt necessary in ancient times was the suite of abilities required to sail across vast expanses of the Pacific Ocean on single-hulled outrigger voyaging canoes. The knowledge of what to do while on the open ocean was also complemented by the detailed mental blueprints and carving skills needed to build the handcrafted canoes that carried people and provisions safely from one island to the next when needed. So remarkable are these skills and the people that embody them that one of the most successful film producers in the world, James Cameron, has credited Micronesian master navigators² with providing a model from which to create an alien culture for his

1. Rebecca Keegan, "James Cameron: 'Avatar' Sequels to Draw on 'Master Navigators,'" Hero Complex, *Los Angeles Times*, March 30, 2012, <http://herocomplex.latimes.com/movies/james-cameron-avatar-sequels-to-draw-on-master-navigators/>.

2. Cameron, an avid ocean explorer and researcher, has visited Micronesia several times for various philanthropic and scientific reasons, including an expedition to the bottom of the Marianas Trench, the deepest location on Earth. His time with master navigator Ali Haleyalur (who performed a traditional blessing three days before Cameron's solo seven-mile dive to the bottom of the Pacific Ocean) and others in the region no doubt fueled Cameron's imagination in such a way that his upcoming *Avatar* projects will feature a culture inspired to some degree by the Micronesian navigator culture touched upon here.

upcoming sequels to the highest grossing film of all time, *Avatar*.³

In today's world, it is a wonder that such knowledge still exists given the availability of new technologies such as GPS and older ones such as outboard engines and fiberglass boats. Despite these modern conveniences, though, the traditional knowledge surrounding navigation and canoe building does endure. It survives in an unbroken chain of cultural transmission between masters and apprentices that has taken place for centuries on the Outer Islands of Yap and Chuuk in the Federated States of Micronesia. This essay will give readers a glance at this knowledge, the people who hold it, and how it remains an important part of Micronesian identity for so many still.

THE YAPESE EMPIRE

Yap State in the Federated States of Micronesia is known as “The Island of Stone Money” to most outsiders familiar with the tropical Pacific island group. This is because of the incredibly interesting system of stone disc currency that still exists today on the main islands of the state (Figure ①). Carved out of rocky hillsides in Palau three hundred miles southwest of Yap, one of the ways these often



3. Ibid.

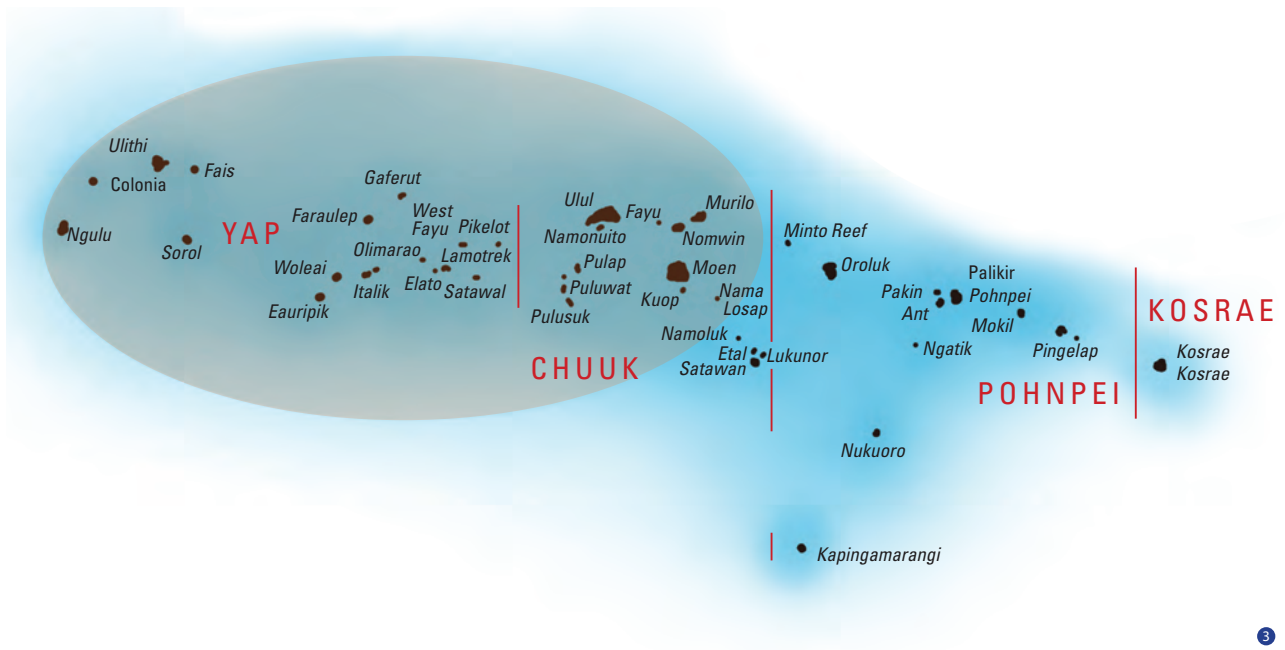
① Yapese stone money on display after it was given to Ngolog Village in 2014 during a rare *mitmit* ceremony. © Stefan M. Krause

huge and very heavy stone discs gain their individual value in Yap is by the rich history each holds, including the perilous journey traveled over hundreds of miles of open ocean via bamboo rafts pulled by Yapese sailing canoes. Today, these two facets of Yapese cultural heritage—the stone money and the open-ocean navigation required to transport it—remain an integral part of the Yapese cultural identity. So important are these aspects of their heritage that each was symbolically inscribed onto the new Yapese state flag in 1980 shortly after the FSM officially gained sovereignty and became a nation (Figure 2).



Along with their main islands, the states of Yap and Chuuk in the FSM also include numerous dispersed outer islands that have jurisdictional ties to their high island state capitals today. As in the past, several of the islands on the present-day maritime border separating the FSM states of Chuuk and Yap still hold strong cultural ties to each other that are bound through a matrilineal clan-based system in which family members are dispersed throughout the island group. These ties were in turn part of the greater Yapese Empire that once stretched over seven hundred miles east from the main Yap islands. It was only during colonization and the introduction of formal boundaries and districts that a line was drawn separating many of these islands from each other (Figure 3).

2 The Yap state flag was created by artist John Gilinug and selected by Yapese citizens in 1980 as the official state flag. In it, one can see the important Yapese symbols of stone money, a voyaging canoe, and a star. According to the artist, the stone money symbolizes “tradition and custom.” The canoe represents “the means and ways of accomplishment” (the way forward to achieve success), and the star is symbolic of a guidance toward the “state’s determinations and goals.” The color blue represents the ocean that surrounds the state, and the white symbolizes “peace and brotherhood.” © Yap State Government



Ethnographer Eric Metzgar has spent decades studying and learning Micronesian navigation and points out the irony that it was actually this division of state territories that may have helped save the traditional knowledge associated with long-distance oceanic navigation.⁴ This is because with the new territorial boundaries, regular ship service connecting related islands did not occur. According to Metzgar, it is likely that navigators from islands such as Satawal and Lamotrek (both in Yap), Polowat (Chuuk), and others continued to practice and transmit their knowledge as they had in the past principally out of necessity—they needed to travel to neighboring islands for vital social and economic reasons.⁵ These reasons could include visiting clan relatives during important periods or traveling to islands or other faraway spots in the ocean that have long held abundant stocks of fish or turtles. It was also important to be able to pick up and leave an island should a typhoon or other disaster wipe out resources there. All of these reasons combined created the rare situation in which modern technologies were not able to overcome traditional wisdom on how best to survive in certain environments. According to Eric Metzgar, a further condition that helped to keep this knowledge from disappearing may have been what is called the “indigenization” of the Outer Island religious community that emerged over the last several decades.⁶ A new wave

4. Eric Metzgar, “Carolinian Voyaging in the New Millennium,” *Micronesian Journal of the Humanities and Social Sciences* 5(1/2) (2006): 293-305.

5. Ibid.

6. Eric Metzgar, personal communication with author, 8 March, 2014.

③ Map of the Federated States of Micronesia showing the outer islands of Yap and Chuuk states in the shaded area.

of Micronesian religious leaders on the islands provided a more flexible modernizing presence that did not discount the value and importance of traditional beliefs and knowledge—including those surrounding navigation. In today's world, it is indeed important to consider the value traditional knowledge can have in addressing modern concerns—something often discounted or at least overlooked by many.

TRADITIONAL KNOWLEDGE IN YAP

Like on so many islands in the Pacific, the period of colonization in Yap (sometimes referred to locally as *Wa'ab*) that occurred over the last couple of centuries took its toll on the abilities of Yapese to continue teaching and learning many of their various forms of traditional knowledge. This disruption in cultural transmission loomed larger on the main island group of Yap, where Germany, Spain, Japan, and eventually the United States each imposed their own cultural norms onto the traditional society to varying degrees. According to preeminent Micronesian scholar Father Francis Hezel, Yap's traditional practices began to fade away at an even more accelerated pace beginning around the 1960s for many reasons having to do with the process of modernization.⁷

The Outer Islands of Yap, however, were not as easily administered largely due to their inaccessibility. Because of this, the process of passing customs and culture on to newer generations faced fewer obstacles from external pressures. This helps explain why today traditional navigation and canoe building are mostly taught, learned, and practiced on the outer islands and not on Yap's main islands. Indeed, on the main islands of Yap, there is only one master canoe carver alive today who still builds canoes as was done by his main-island ancestors: Chief Bruno Tharngan. As far as navigational skills go, it is only the *paliuw*⁸ of Yap and Chuuk's Outer Islands that still hold and protect this incredible body of knowledge.

7. Francis Hezel, personal communication with author, 23 July 2014.

8. According to Eric Metzgar (personal communication), *paliuw* is the designation given to navigators in most of Yap's Outer Islands except Satawal. In Satawal and the western islands of Chuuk State, the term is instead *palu*. So as not to confuse, the term *paliuw* will be used below to refer to both groups.

THE PALIUW

“I was born into a family, a lineage of navigators. They are all master navigators. Their ancestors are all navigators also. So it is something that has been passed down from generation to generation.”

-Ali Haleyalur, master navigator from Lamotrek Island, Yap State⁹

Ali Haleyalur from Lamotrek (Yap) is one of a few master navigators still practicing and teaching the ancient art of wayfinding (Figure 4). He has been on numerous journeys across the open ocean on various outrigger canoes such as the famous *Simion Hokule'a* (Figure 5). As indicated in the quote above, he is the latest in a long line of *paliuw* (navigators). He is



also the son of a famous *paluelap* (grandmaster navigator) from Satawal and Lamotrek, the late Jesus Urupiy, who himself embarked on countless voyages throughout Micronesia. Indeed, Urupiy was instrumental in the efforts to preserve the traditional knowledge associated with Carolinian navigation when in 1990 he performed the *pwo* initiation ceremony for five apprentice *paliuw*, including his son, Ali. The last time the *pwo* was conducted prior to this was in the early 1950s, when the well-known navigator Mau Pailug from Satawal (Yap) was initiated. It is now up to Ali and a very small group of additional master navigators (including Urupiy’s last remaining brother, Rapwi Alwaich) to continue to initiate

9. Ali Haleyalur, personal interview with author, 21 February 2014.

4 (From top left clockwise) Master Navigator Ali Haleyalur, Chief Bruno Tharngan, former Yap State Governor Vincent Figir, and master canoe carver Xavier Yarofaliyang. This photo was taken on Lamotrek (Yap) during the launching ceremony of the voyaging canoe known as the *Queen Veronica*. © Manuel Eloimai

5 The *Simion Hokule'a* in Guam, captained by Ali Haleyalur. The *Simion Hokule'a* joined the *Mathow Maram*, captained by Chief Bruno Tharngan, on a historic journey in 2010 from Lamotrek to Guam, and then on to Yap and Palau. As ethnographer Eric Metzgar notes, it was the first time in over a hundred years that this journey was taken. This picture was given to the captain of the canoe, Ali Haleyalur, by an unidentified tourist.

future generations of worthy navigators who are willing to undergo the intense training needed to captain sailing canoes across the dangerous open ocean without the use of modern instruments.

THE PWO AND THE ART OF WAYFINDING

The incredible suite of traditional knowledge that goes into understanding how to sail across hundreds of miles of open ocean is a collection of skills that is held and protected among the few remaining paliuw in Micronesia. Traditionally, paliuw learn this knowledge from fathers or uncles within their family and eventually, when ready, may pass through the pwo ceremony. This knowledge is a valuable gift given to them by their ancestors, and as such it is only taught and given to those deemed worthy. To do otherwise would not only dilute its value as a specialized knowledge in a society where such skills can be traded for other things (most importantly, food); by giving out this knowledge freely to all, it would also dishonor the ancestors and master navigators of an earlier age who knew how important it was to protect this special information since it is, in many ways, a magical gift from beyond the natural world.

Among the paliuw of Micronesia, wayfinding is a remarkable skill that draws on a fund of information held in the minds of the navigators. The stars, the ocean, the sea-life, the clouds, the winds, the currents, and the waves—all part of the physical environment around them on the open ocean—are each variables of which paliuw must master an understanding. As Father Hezel points out, “Gladwin¹⁰ and others remind us that in dead reckoning, the method used by island navigators, such knowledge [as cloud formations, species of birds and their flight patterns, nuanced understanding of how colors (e.g., of the sea and the sky) change in the proximity of land] offers a clue as to the closeness and even direction of land.”¹¹ Of course, this takes years and years of intense learning on the islands from their teachers and then, most importantly, practical experience at sea on the canoes. It is understood that if you do not learn everything there is to know, you will be risking not only your own life on the journeys but also those of your fellow crew.

10. For a comprehensive account of traditional navigation in Micronesia, see Thomas Gladwin's *East is a Big Bird: Navigation & Logic on Puluwat Atoll*, Cambridge: Harvard University Press, 1970. In it, Gladwin described this suite of knowledge needed as a way of “expanding the target.”

11. Hezel, personal communication, 2014.

Part of the training on learning how to navigate is to memorize all the stars in the night sky and the locations where they rise and fall on the eastern and western horizons (Figure 6). Navigators must



also know the locations of all the islands in the region in relation to the stars that rise above each so that they can line up their headings according to the routes from one way-point to another, all of which they also memorize. Since it is rare, however, that a voyage will take a straight course at all times, this skill takes much more than knowing under which stars to orient their canoe. Currents, bad weather, and all sorts of other variables make it necessary to constantly determine the canoe's changing position in relation to its route and to recalculate the heading. Along with the stars, paliuw need to learn a whole host of other types of knowledge in order to ensure they stay on course. They are, therefore, taught how to read the waves, currents, sun, wind, and clouds in the daylight or whenever the stars are not visible. Lessons, experience, and practice, therefore, all combine to give the master navigators an incredibly perceptive ability to “feel” their way along their paths when needed. Oftentimes, paliuw will sit for hours in silence on the canoe “feeling” the waves,

6 Larry Raigetel of Waa'gey observes as a student demonstrates his knowledge of the star compass used by Yapese navigators. Each stone represents a star in the night sky that navigators must memorize. © Stefan M. Krause

winds, and currents in order to correctly adjust their headings. Given the enormous amount of information that must be processed at all times, it is truly remarkable how accurate non-instrument Carolinian navigation can be.

However, it is not only wayfinding that paliuw must master for survival on these journeys. They must also know other crucial things such as the magical chants and incantations needed to deal with adverse weather. They need to learn where certain forms of sea-life are to be found so they can use this information to determine the location of their canoes on the open ocean. They have to know how to repair canoes at sea and how to right canoes that may have capsized.¹² Similarly, they need to possess a keen understanding of local medicinal practices in case of injury or illness on board the canoe. Along with all this, master navigators must also be skilled leaders in order to deal with their crews and know how to manage them in times of crisis. If, for instance, one member becomes unruly and threatens the safety of the others, the paliuw must be able to take control of the situation; this could include using their skills of martial arts when needed to subdue the crew member. It is indeed remarkable to consider just how much knowledge, confidence, wisdom, and practical experience a master navigator needs to possess to ensure that perilous journeys have the best chances for safety and success.

YAPESE CANOES¹³

“The first canoe that came here to Yap we called thow'ab... they lowered it from heaven...and thow'ab means something like 'it came from Yap,' that's why they call it 'tho' 'wa'ab.”

Chief Bruno Tharngan¹⁴

Before the introduction of boats and outboard motors to the islands, various different types of canoes were commonly found throughout Yap's main island group. There was a canoe named a *thow'ab* that was flatter and mainly used for transporting people and things throughout the calm canals and near-shore waters. This canoe was

12. A related skill is the ability to flip a canoe over in the event of a major storm or typhoon. Since the wooden vessels do not sink, the masts can be taken down and the canoe can be turned upside-down to provide protection during severe weather. Crew can take shelter underneath and inside the canoe where an air pocket is formed. Eric Metzgar (personal communication) notes that this a major advantage of the single outrigger canoe style found throughout the Carolines since it is not possible to do the same with the double-hulled canoes found elsewhere in the Pacific.

13. For a much more detailed and informative presentation of Micronesian canoe building traditions, please refer to “Sailing Canoe Building on Mwoakilloa Atoll” in this volume.

14. Bruno Tharngan, personal interview with author, 21 February 2014.

propelled by paddling or with long bamboo poles to push it through the shallows. As Chief Tharngan notes above, it is thought to be the first canoe that was built in Yap. There was also the *chugpin*, a more ornate and decorative canoe that could be sailed or paddled and was known for its white swan-neck carvings on the tips of both ends, from which dangled a string of shells. According to most accounts, the *chugpin* was a seasonal canoe that was used when fishing for flying fish around Yap's reefs. Then there was the *gawel*, a special paddling and sailing canoe that had at both tips a carved crescent-shaped feature with a bird in the middle that rotated to one of two positions—an open-facing position perpendicular to the canoe that indicated it was at war, and a closed position in line with the canoe that communicated it was on a peaceful mission. Finally, there was the *popow*, a voyaging canoe built with specifications that enabled it to sail long distances across dangerous seas (Figure 7).



15. While the *popow* and the *chugpin* are the only main-island style canoes found on Yap, the outer island communities on Yap's main islands have several canoes of their own. Many are smaller canoes not meant for voyaging. It should also be made clear that throughout the outer islands of both Yap and Chuuk states, canoe building (of various types) is still commonly practiced.

Until just recently, it was only the *popow* that could still be found on the Yap main islands.¹⁵ In 2013, however, Chief Tharngan resurrected the *chugpin* (Figure 8) by using historical pictures to complement the little knowledge still heard in the oral histories about their design. It was the first time in decades that a *chugpin* sailed the waters of Yap. Chief Tharngan hopes to one day also revive the *tho'wab* and *gawel*

7 The *Laikiy*—a *popow* voyaging canoe built by Chief Bruno Tharngan. © Stefan M. Krause

as well with the help of the Yapese Traditional Navigation Society (TNS) (Figure 8).



SAILING AHEAD

A few decades ago, several master paliuw from the Outer Islands of Yap and Chuuk helped to usher in a period of revived interest in traditional navigation throughout the Pacific. Eric Metzgar notes that this revitalization movement can perhaps be traced to a handful of master paliuw such as Hipour and Ikuliman from Puluwat (Chuuk) and Repunglap and Repunglug from Satawal (Yap), who in the late 1960s and early 1970s began to once again “open” ancient sea routes used by their ancestors before them.¹⁶ It was then the well-known navigator Mau Piailug from Satawal (Yap) continued the renaissance by completing numerous voyages throughout Micronesia and even helping to teach the ancient art of oceanic wayfinding to Hawaiians and other Polynesian cultures that had lost the traditional knowledge. As mentioned above, Chief Bruno Tharngan and TNS have taken the torch to carry forward a tradition of canoe building that had almost been lost completely in their society but that is

16. Eric Metzgar, “Carolinian Voyaging Reinvigorated.” IN *Vaka Moana: Voyages of the Ancestors*, ed. K. R. Howe (Honolulu: University of Hawaii Press, 2007), 330-331.

8 Members of the Traditional Navigation Society launch the *chugpin* that Chief Bruno Tharngan built. This is the first time in many decades that a *chugpin* has been in Yap’s waters. © Stefan M. Krause

9 Chief Bruno Tharngan, the only canoe builder from Yap’s main islands, using his adze to carve one of his canoes. © Stefan M. Krause

now seeing a resurgence through efforts such as the annual Yapese Canoe Festival. What these knowledge-holders have in common is the recognition of the dangers of these traditions being lost forever and an understanding of the need to find new ways to teach their wisdom to newer generations.

Along with those above, Larry Raigetel and his wife Regina are working with their community-based NGO, Waa'gey, in preserving canoe building and navigational traditions in Yap. One of Waa'gey's recent projects has been to hold workshops with students at Yap Catholic High School, who participate in building a small traditional Outer Island canoe as an after-school activity (Figure 10). According to volunteer teacher Patrick Kelly, interest has been high with the program as numerous students regularly choose to come and grab an adze and join in on carving supervised by Raigetel and several outer island navigators/canoe builders.¹⁷ Learning from navigators such as Carlos Yarofaireg (who himself had passed through the *pwo* ceremony with Ali Haleyalur on Lamotrek in 1990 and had also captained numerous voyages) is a wonderful opportunity, and youth participants recognize the value of participating.



As 18-year-old high school student Eunice R. Yamada states, “I want to learn how so I can encourage youths to participate in learning the skills so that they wouldn't be lost. Because I know it is important for our culture to have it. It's our tradition.”¹⁸ Yamada comes from a family of Outer Island navigators and also notes, “I like working and building canoes and building houses because I want to follow my father's footsteps. My father is a master canoe carver and I want to be like him, I want to carve canoes.”¹⁹ Yamada also pointed out one of the most practical reasons why these traditions should still be passed on: fuel and fiberglass boats are expensive. Traditional canoe building and navigational knowledge offer a sustainable alternative to costly motorboats used for fishing and traveling to neighboring islands. This understanding of the economic benefits of preserving this important element of Yap's cultural heritage is a powerful argument that underscores the relationship between traditional knowledge and sustainable development practices not just in the Pacific, but around the world.

17. Patrick Kelly, personal interview with author, 27 February 2014.

18. Eunice R. Ramada, personal interview with author, 27 February 2014 .

19. Ibid.

10 Larry Raigetel and members of Waa'gey working with students at Yap Catholic High School who are learning the basics on how to carve a traditional Yapese canoe. © Stefan M. Krause

Raigetel often uses a navigational metaphor to help students such as Yamada understand the importance and necessity in continuing to teach and learn the traditional knowledge from the islands. He points out that cultural heritage preservation is vital to a society's development and that this awareness can be cultivated using an analogy to sailing under the stars. As Raigetel notes, “Before losing sight of the land of origin, the navigator must look back to know which star it will disappear under so he can determine the course for the land of destination—it is a critical celestial navigational reference.”²⁰ He further makes this clear when speaking about how critical cultural preservation is: “In order for us to move forward, we must know from where we came. Thus, our culture, which is really our identity, is key for us to move forward.”²¹ Keeping an eye on their pasts, today’s Yapese navigators and canoe builders are helping to steer a course to a better tomorrow.



20. Larry Raigetel, personal communication with author, 25 February, 2014.

21. Ibid.

11 Master navigator Rapwi Alwaich (brother of the late Uripey) and his grandson inside the lagoon of Puluwat (Chuuk). © Christine Wagner

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