

JPS

The Journal
of the
Polynesian Society

VOLUME 126 No.2 JUNE 2017

THE POLYNESIAN SOCIETY
THE UNIVERSITY OF AUCKLAND
NEW ZEALAND



WITHOUT PRECEDENT: SHIFTING PROTOCOLS IN THE USE OF RONGELAPESE NAVIGATIONAL KNOWLEDGE

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At the onset of light winds characteristic of the traditional voyaging season known as *rak*, in June of 2015, the protégé of one of the last reputed navigators in the Marshall Islands attempted a canoe journey under extraordinary social conditions. The elder, who had trained secretly in his youth on the northwestern atoll of Rongelap, had only recently (in 2006) received permission from his chief to attempt a trial at sea to become a navigator and to pass on his knowledge to an apprentice.¹ This sharing of navigational knowledge extended beyond direct family lines of inheritance for the first time in the Rongelap community. Complicating an already delicate balance between, on the one hand, the imperative for cultural revival of an art on the brink of being lost forever and, on the other hand, respect for chiefly authority and maintenance of family prestige, the navigator became severely ill just a few days before the 2015 voyage. His protégé made the bold decision to set sail without his teacher. I contend that an apprentice navigator demonstrating his prowess without his teacher was unprecedented under traditional chiefly protocols, which restrict the use of traditional specialist knowledge in the Rongelapese community. Nonetheless, such a shift in etiquette might have been the only viable path to ensure cultural survival amidst encroaching environmental and social impacts.

RESTRICTIONS

Specialised voyaging knowledge was especially powerful in the Marshall Islands during the pre-contact era and early historic times. After settlement approximately 2,000 years ago, building and sailing the lateen-rigged voyaging outrigger canoes, predicting the weather and strategising the timing of voyages based on astronomical observations, and navigating by sensing disrupted wave patterns enabled widespread communication within and beyond the two main island chains. This resulted in the greatest geographical extent of a single linguistic group in Oceania (Rehg 1995). Inter-island voyaging connected island communities, making life on these resource-poor coral atolls possible. The first Western contact with the Marshallese was chronicled by the Spanish explorer Álvaro de Saavedra Cerón, who sighted several northern atolls—including Rongelap—in 1528 and then went ashore at either Bikini or Enewetak in 1529 (Fig. 1). This moment, and occasional

brief visits in the 16th century by other Spanish explorers along the galleon route, did not significantly alter these traditional patterns of voyaging (Hezel 1983). Observations from the early historic period suggest that the highly specialised proprietary knowledge and techniques remained tightly held by members within lineages, such that village elders or hereditary navigators controlled their use and transmission. Synthesising this information, D'Arcy (2006: 94-97) argues that throughout Oceania the restrictions and tight controls on the dissemination of navigation, weather forecasting and astronomy, and to a lesser extent canoe-building, contributed to a fragility of seafaring institutions that made the voyaging cultures vulnerable to sudden catastrophic events. For example, natural disasters and introduced Western epidemics could annihilate a community's seafaring expertise very quickly.

A glimpse into the pre-contact social structure and regulations of proprietary seafaring knowledge in the Marshall Islands comes from the German Catholic missionary and long-time resident August Erdland (1914: 99-101) who documented four levels of hierarchy, mostly pertaining to land tenure. The *kajur*, or commoners, were effectively serfs with rights to some

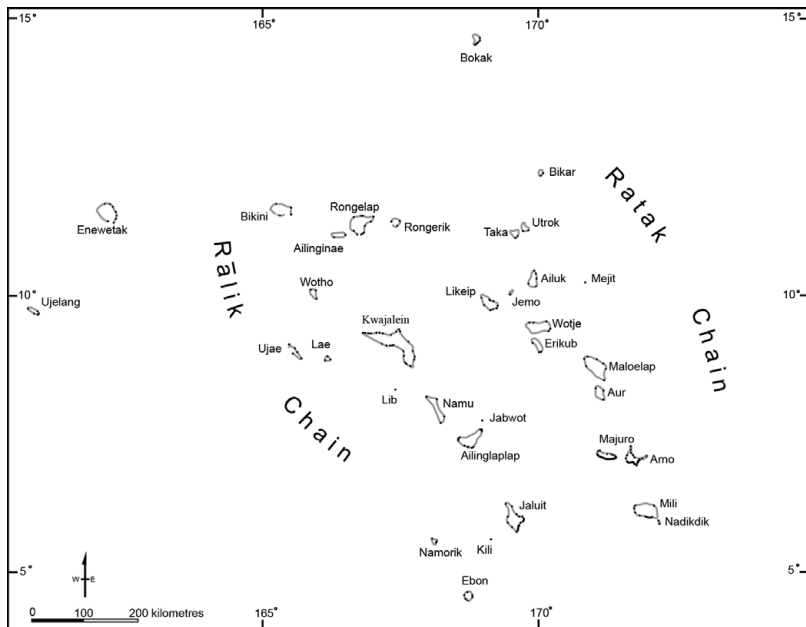


Figure 1. Map of the Marshall Islands.

of the resources on a single allotment of land; the *ledikdik* were commoners with elevated advisory status to the chiefs, with rights to a single allotment of land inheritable by their descendants in perpetuity; the *buirak* of low chiefly lineages held rights to more than one allotment of land; and the *iroij* of the highest chiefly authority maintained rights to land on the same atoll and occasionally on other atolls. The advisory *ledikdik* also had a class of *atok*—“strong and powerful” individuals with specialist skill, knowledge and wisdom, including male and female warriors, medicinal healers, sorcerers and navigators. Their positions were hereditary—the title and associated knowledge were passed on to the eldest skilled child after the death of his or her *atok* parent.

Erdland’s (1914: 99-101) description suggests that the distinct yet related cultural domains of inter-island voyaging—canoe-building, weather forecasting, astronomy and navigation—were tightly controlled within this tiered social and political system. The voyaging specialists of the *atok* class worked with their *iroij* in a reciprocal relationship—in return for providing the *iroij* with the means of inter-island transportation and communication, the specialists were taken care of by their chiefs. According to a narrative collected by Tobin (2002: 388), canoe-building specialists received special gifts for their services such as mats, rope and food, while the regular workers—hundreds in numbers—received food during construction of the canoes. Given that inter-island voyaging facilitated cultural survival, navigators were held in the highest regard—for their knowledge, technical expertise, and personal fortitude. Among the neighbouring Carolinian atolls, for instance, skilled and intrepid navigators could attain status and prestige greater than that of a chief (Alkire 1965; Peterson 2009: 115).

The system of reciprocity between the *atok* voyaging specialists and *iroij*, as documented by Erdland (1914: 99-101), resonates with descriptions of ancient cosmologies. According to Carucci (1997: 207), *iroij* served as living intermediaries between their people and ancient deified chiefs. Intercessory prayers by the *iroij* helped the commoners obtain productivity of land and marine resources, and in return, the commoners offered a portion of that food abundance to their chiefs. Just as these exchanges were ritualised, the seafaring specialists of the *atok* class worked for their *iroij* under strict protocols of knowledge use and transmission. The *iroij* permitted their navigators and weather forecasters and, to a lesser extent, their canoe builders, to impart the specialist knowledge to only a few apprentices. Usually the voyaging specialists passed on their knowledge to their children. Only a select number of individuals within a few lineages (*bwij*) held these specialised forms of knowledge. Alson Kelen,² the navigation apprentice introduced above, spent part of his childhood listening to elders’ stories from Bikini and describes the enduring power of this lineage-based seafaring knowledge:

Bwij is the family lineage that holds the power on land. Things come down through the *bwij*. The elders will sit around the fire and consider who will be the next in line, even if the parent of the unborn child is still a child himself! They all focus on that unborn child. Once born, he will absorb the stories of his grandparents so the navigational skills from the whole lineage and broader clan will transfer to him. It is a big decision that is only shared among a few people. Sometimes this might involve two or three children. Some may be selected to learn canoe-building and others medicine. Navigation is more sacred than canoe-building and weather forecasting. It involves higher training. And you train from the time you are a baby with the motion of a basket floating on the water until you grow up. Canoe-building can be learned later, but navigation you learn from the moment you lay down in that basket as a baby. That is a lot of commitment from the *bwij*. The chiefs own the knowledge. (Kelen 2015)

The restriction in the transfer of voyaging knowledge, especially navigation, reinforced a professional secrecy and rivalry between navigators of different chiefly authorities, which led to the development of distinctive lineage-based schools of navigation (Davenport 1960: 23; Erdland 1914: 77; Krämer and Nevermann 1938: 215) where, as Kelen succinctly states, “the chiefs own the knowledge”. Unlike the descriptions of the culturally distinctive, formal schools of navigation among the neighbouring Carolinian atolls, there has been little ethnographic attention to regional differences in the Marshall Islands. Many of the early studies conducted by German ethnologists in the late 19th and early 20th centuries were centred on Jaluit in the southern region of the western Rālik chain. The so-called stick charts acquired during that time largely map the southern Rālik chain, and it would thus not be surprising if a particular school of navigation once characterised this region. Krämer and Nevermann (1938) recorded the name of this area as Rak in Meto ‘Southern Ocean’ and other quadrants in the archipelago as En in Meto ‘Northern Ocean’ for the northern part of the western chain, Ratak En ‘Northern Sunrise’ for the northern area of the eastern chain, and Ratak Rak ‘Southern Sunrise’ for the southern atolls of the eastern chain. These and other named seas likely developed their own variations in navigation. Unfortunately, there is very little information to reconstruct regional or smaller scale lineage-based variations in navigation. This paucity of information may reflect the Jaluit-centred early ethnographic research, the state of decline of voyaging at the time of that German research, and the limited ability of the ethnographers to engage active navigators. It appears that one navigation school in the northern Rālik chain went unnoticed by these early ethnographers and remained somewhat intact through the first waves of colonial disruptions.

DISRUPTIONS

Societal changes wrought by successive waves of foreign influences and administrations greatly contributed to the decline of traditional voyaging culture in the Marshall Islands. Starting in the mid-19th century, periods of missionisation, economic development, militarisation and nuclear testing resulted in radical transformations in lifestyle and customary practice. Among the myriad social changes were the waning of spiritual meanings associated with navigation and a decrease in the power of the chiefs to regulate the use of navigation.

The embracing of Christianity with the arrival of American Protestant missionaries on Ebon in 1857 undoubtedly resulted in the loss of some of the deep spiritual beliefs and associated rituals of navigation. Nonetheless, some enduring or remembered connections between navigators and the spirit world were ethnographically recorded in the early 1900s. For instance, navigators and their sailing crew in the northern Rālik chain were prohibited from using particular words when sailing to Rongelap (Krämer and Nevermann 1938: 221). Navigators also described how spirits (*ekjab*) residing in marine and bird life, as well as in reefs and waves, benevolently guided disoriented navigators safely toward land (Erdland 1914). Other traditional beliefs regarding voyaging and navigation remain largely hidden from the ethnohistoric accounts but were likely shaped or further eroded through the direct impacts of colonisation.

The German colonial administration, established in 1885 to acquire and export copra, altered the traditional hierarchical power of the chiefs in several ways. It prevented warfare, which precluded *iroij* from exerting their influence through military prowess. It also created a tax in the form of copra and, as the German officials collected the copra from the *iroij* rather than directly from individuals, they essentially strengthened and formalised the power of a select set of *iroij*. It also terminated the customary ability of commoners to depose of despotic chiefs. This led to the collapse of the social structure, as recorded by Erdland (1914), into the three levels of *ri-jerbal* ‘commoners’, *aḷap* ‘lineage head’ and *iroij* ‘chief’. New interactions between the elevated, divine-like *iroij* and the German colonial authorities and their secular interests in commerce led to different relationships between the chiefs and the commoners (Carucci 1997). The German Administration began securing the exclusive use of the harbour at Jaluit and special trading privileges in the western Rālik chain. The Germans also elevated the status of some Marshallese navigators to that of a “real captain”, so that they could sail throughout the islands to collect copra and other forms of tribute for their chiefs (Knight 1999: 109).

The most immediate and direct colonial impacts on seafaring during this time period were prohibitions and bans on the use of voyaging canoes and traditional navigation. The German Administration placed clear restrictions on inter-island canoe travel. They discouraged voyaging because of its presumed inherent dangers, the costs of searching for and retrieving shipwrecked and adrift islanders, and lost revenues with their trading companies (Alkire 1978: 141; Hezel 1995: 108). The colonial German Administration's discouragement of traditional navigation was not unique to the Marshall Islands. David Lewis (1994: 17) for instance reported that a canoe captain from Ninigo in the Bismarck Archipelago specifically attributed the loss of traditional navigational knowledge on that atoll to the effect of the regulations imposed by the German Administration.

The Marshallese developed a distinctive cultural response to the new forms of knowledge introduced by Westerners. In many contexts, scholars have observed that the Marshallese have often rejected, or acted ambivalently towards, their cultural traditions, while valorising the "other" (Carucci 2001; Walsh 2003). This inversion of tradition (Thomas 1992) began in the late 19th century when the chiefs expanded their economic power through control of European maritime technologies. They used their wealth to begin purchasing European designed schooners from German and British trading companies, starting with the few wealthiest *iroij* in 1885 and ending with nearly every *iroij* owning at least one small schooner by 1910 (Spennemann 2005: 33). The chief of Jaluit, for instance, extended his sphere of influence northward to Rongelap and Bikini with sailing vessels that had been given to him by Europeans in exchange for extending copra production (Carucci 1997: 203).

The newly acquired European schooners had a strong impact on the collapse of the social infrastructure behind canoe voyaging. The increased carrying capacity of the European vessels was immediately apparent to the chiefs. Since they tightly regulated the use and transmission of voyaging knowledge within lineages, they monopolised this new maritime technology. The shift from traditional canoes to European schooners was accelerated by the chiefs' perception of the prestige derived from owning this novel European maritime technology. Marshallese mariners, influenced by their chiefs, readily adopted or adapted Western boat construction and design. Generally, the lack of chiefly motivation and support for the traditional canoe-building skills and knowledge threatened community support for the building, maintenance and sailing of traditional canoes (Spennemann 2005).

Still, some patterns of inter-atoll communication continued toward the end of the 19th century during the time of the German colonial administration and were in part shaped by the principles of traditional chiefly ownership and reciprocal obligations. Spennemann (2005) argues that chiefs maintained rights to land, people and resources on more than one atoll, and chiefly forged

inter-atoll alliances provided relief from natural calamities. For instance, in 1909 a chief on the southern Ratak atoll of Maloelap exercised his right to collect birds and turtles on the far northern uninhabited atoll of Bokak. By the early 20th century, traditional sailing in the Marshall Islands was for the most part limited to voyages between closely spaced atolls and within lagoons (Giesberts 1910); however, some seafaring traditions within the archipelago persisted amidst the colonial impositions.

At the end of World War I in 1919, the Marshall Islands were given to Japan as under a League of Nations mandate, and Japan's influence on the Marshallese culture in general, and voyaging in particular, was considerable but not absolute. The Japanese aimed to "civilise" the Marshallese through their doctrine of assimilation. The Japanese altered the local political structure through the creation of government chiefs, positions that were not legitimised in traditional village-based or community authority. The Japanese also introduced the Marshallese to the practical benefits of formal education and health care, as well as continuing restrictions on the use of canoes and traditional navigation that had been initiated under the German Administration to minimise search and rescue operations (Alkire 1978: 141).

During World War II, the Japanese war effort had a transformative influence on the Marshall Islanders' lives, one that was highly variable from atoll to atoll (Carucci 2004). Some Marshallese faced extreme hardships under an increasingly violent Japanese occupation, conditions that actually encouraged a resurgence of local sailing practices. They suffered physical danger, exhaustion, ongoing air raids and shortages of food and shelter as the war continued, especially on those atolls that were by-passed in the initial invasion. With dwindling food supplies, starvation was particularly acute on atolls with heavily garrisoned Japanese bases, including Jaluit, Mili, Maloelap and Wotje, and some Marshallese feared Japanese threats of extermination (Falgout *et al.* 2008: 95, 141). Some Marshallese made the daring decision to escape on their canoes by sailing or drifting on the ocean to distant atolls. After invoking traditional kinship ties for nurturance and seeking sacred protection through a combination of traditional and Christian beliefs, they sought refuge via the sea. By doing so, they risked dying at sea, being killed by Japanese forces, facing the unknown treatment of the Americans and leaving behind family members who might be killed for retribution (Falgout *et al.* 2008: 159-65). In another case, the Japanese on Enewetak actually used their canoes to transport their soldiers between islets (Carucci 1989).

During this period, the Marshallese began to implicitly devalue their traditional practices in favour of powerful ideas of development and progress (Walsh 2003). The US military and subsequent administration of the region, first under the command of the US Navy and later in 1947 as the US Trust Territory of the Pacific Islands, left strong impressions of American power,

wealth and knowledge on the Marshallese. The Japanese had expected the Marshallese to assimilate into their expanding empire during the initial colonial era, but then treated them inhumanely during the military era as the tide of the war shifted in favour of the Americans. Witnessing the defeat of the Japanese through American military might, the Marshallese drew a quick contrast between the power of the Americans, manifested also in their generosity and benevolence, and that of the Japanese.

With favourable impressions of the US, the Marshallese began to refashion Americans as chiefs by attributing the source of American intelligence and military power to their mythological trickster, Letao (or Etao) (Carucci 1989). Stories describe how Letao escaped southward from his pursuers in Mili after tricking their chief into roasting himself alive in an earthen oven. Then after escapades in Kiribati and other island groups, Letao was finally captured and trapped in a bottle by the Americans. According to the stories, the US military tapped into Letao's extreme powers, as evident to the Marshallese in the destructive capabilities of the American bombs during the war (Carucci 1989: 91-92; McArthur 2000: 92). The mythological connection to Letao further contributed to a growing cultural valorisation of non-traditional knowledge and practices in the post-war era. In 1946, and for several years thereafter, Marshallese from a few atolls witnessed considerable power that only make sense in terms of Letao's destructive force—a power that would have far reaching consequences for the Rongelapese navigation traditions.

FALLOUT

The sea of Adjoklā 'Our Northern Wind', as described by Rongelapese elders, encompasses the atolls of Rongelap, Rongerik, Ailinginae and Bikini. Through *bwebwenato* 'stories, oral traditions', the descendant communities trace their ancestry to Lainjin, whose mother Litarmelu first learned to read the surface of the ocean from two foreign navigators hailing from distant westward islands. Captured in primordial narratives of Litarmelu is her learning of navigation: lying prone in a canoe, she was towed around a circular reef to feel water movements that simulate island-induced waves, like those used in the remote sensing of land from ocean-going canoes (Tobin 2002: 117). Although not formally named, a derivative school of navigation developed in the region of Adjoklā, centred on a similar reef formation on Rongelap.³ The atoll of Rongelap is almost circular, with most of the atoll's islets concentrated along the eastern side. Since the western side is mostly void of islets, swells flowing from the west enter through a deep pass and travel across the lagoon. At one of the tiny eastern islets, navigators apparently noticed the intersection between the westerly swell that had travelled across the lagoon and waves that had dissipated greatly from the breaking of the easterly trade wind-driven swell.

In about a metre of water, this small circular reef simulated how ocean swells transform in the vicinity of islands. This natural wave simulation became the focus of what was to develop into a regional school that attracted navigation apprentices from Rongerik, Ailinginae and Bikini, as well as Kwajalein far to the south. According to my Rongelapese consultants, eight students were actively learning wave navigation there in the late 1940s and early 1950s. Over the course of a year in 2005 and 2006 I had the opportunity to talk to three elders who had learned navigation at the reef on Rongelap: Isao Eknilang, who was born in 1941; his younger sister by five years Lijohn Eknilang; and their cousin Willie Mwekto, who was born in 1948. The Adjoklā traditions, as remembered by these three stewards of navigational knowledge, endured despite the overall decline in Marshallese voyaging during the first half of the 20th century. These northern atolls were geographically distant from the colonial administrative centres and this relative isolation likely fostered the perpetuation of the navigation traditions. However, such a remote place was ideal for US military strategists to plan the testing of advanced weaponry, the fallout from which directly impacted the lives of the remaining stewards of Rongelapese navigation.

Between 1946 and 1958, the U.S. Government detonated 67 atomic and thermonuclear bombs on the atolls of Bikini and Enewetak as part of its post-World War II nuclear weapons program. The 1954 Castle Bravo test was particularly devastating. The unprecedented explosion, equivalent to the force of 15 megatons of trinitrotoluene (TNT), vaporised islands on Bikini and the surrounding sea water and formed a giant mushroom cloud of coral debris that released radioactive fallout. The Rongelapese were not evacuated until two days after the Bravo test, despite a westerly wind shift observed in advance of the blast. They suffered acute radiation sickness due to direct exposure and subsequently through contamination of their terrestrial and marine food resources. Told it was safe to return in 1957, the Rongelapese remained living in a nuclear contaminated world until their self-exile in 1985. The consequential damages of the Bravo test severely undermined their health and subsistence, as well as their community integrity; their psychosocial well-being was further damaged by their treatment as human subjects in biomedical experiments (Barker 2013; Johnston and Barker 2008).

In an instant, the Bravo test prevented the Eknilang siblings and Mwekto, then in their early childhood, from continuing their instruction in navigation on Rongelap. Another Rongelapese child, six-year old Korent Joel who would come to be known as Captain Korent in the maritime community, retained clear impressions of the blast that he witnessed from Kwajalein some 190 km to the south. After returning to Rongelap in 1959, Joel began quietly learning from his ailing grandfather Hemmerik Lewia. He took Joel

to the simulation reef, sailed across the lagoon of Rongelap and voyaged to nearby Ailinginae and Rongerik. Starting at the age of eleven, Joel studied navigation for five years until his grandfather succumbed to severe radiation sickness. Feeling that Rongelap was still contaminated, Joel's family sent him to Honolulu. When the rest of the Rongelapese relocated to Mejjatto and Ebeye on Kwajalein and various locations on Majuro in 1985, they became, in their own words, "nuclear refugees", living in exile from their ancestral homeland.

Joel describes the missed opportunity for him and others to become navigators of Rongelap (Genz 2011: 12-13). Not only did he and the others lose their teachers to the effects of radiation exposure, but they also lost the requisite community infrastructure to build and sail voyaging canoes once the community became displaced and relocated to distant islands. In particular, the fragmented Rongelapese community described the poor sailing conditions on Mejjatto (Barker 2013: 66-67). Ultimately Joel and other aspiring Rongelapese navigators lost the chance to *ruprup jōkur*. This nautical expression and proverb, literally translated as "to break the shell", connotes a ritualistic process of initiation. Demonstrating their navigational prowess at sea under test conditions would entail a simultaneous intellectual growth, social transformation and chiefly sanctioning of becoming a *ri-meto*, 'person of the sea' or navigator.

Complicating Joel's ability to take his *ruprup jōkur* navigation test while living in exile was the fact that the teachings of his grandfather had not been sanctioned by his chief. Shame would have come to his grandfather if the chief had learned of this unauthorised teaching of navigation. Joel eventually became a ship captain, working on large government transport vessels using sextant-based celestial navigation. For the next 30 years Joel was unable to share with anyone what he had learned on Rongelap for fear of heightening the shame from having stepped beyond the chiefly authority that owned his knowledge. Joel feared a threat of exile from the Rongelapese community if he had acknowledged that he knew how to navigate.

The social fallout from the forced relocation of the Adjoklā communities and resulting termination of the navigation training on Rongelap was profound. Traditional voyaging in this last Marshallese stronghold of navigation was completely abandoned. Pronounced societal changes in the post-nuclear era introduced by the administration of the U.S. Trust Territory of the Pacific Islands compounded the loss of traditional canoe use and navigation. The "motor-boat revolution" of the 1960s introduced a new technology that was symbolic of prestige, modernity and success in a newly monetized world (Marshall 2004: 62-65; Miller 2010: 99). Joel describes how elder Toshiro Jokon ran out of fuel while motoring between Maloelap and Majuro. Joel, who by now had moved up to commanding the search-and-rescue missions, was called on to locate Jokon. Ironically, Jokon had previously captained a

traditional voyaging canoe from Aitutaki to Rarotonga in the Cook Islands during the 1992 Festival of Pacific Arts (Finney 2003: 47-48). But even after Joel saved him, he could not share with anyone that he knew how to navigate by the waves. With Jokon's passing in 2003, Joel still could not publically claim expertise as a *ri-meto* despite his reputation, quietly spoken in the maritime community, as one of the last traditional navigators in the Marshall Islands.

REVIVAL (PHASE 1)—THE NAVIGATOR

In 2003, prior to the maritime community's perception of Joel as the "last navigator", the protocols on sharing voyaging knowledge had shifted in two distinct ways. These changes enabled Joel to call for a concerted effort to document wave navigation as the first phase of the voyaging revitalisation project (2005–2009). The first shift involved a democratisation of canoe-building and sailing, where the knowledge essentially escaped the strict chiefly regulations of lineage-based traditions and became open to everyone (Miller 2010). What had started out as a salvage documentation project of canoe designs and the construction process on a few atolls in the late 1980s shifted to a training program for youth to build their own canoes through the community organisation Waan Aelōñ in Majol (literally Canoes of the Marshall Islands) (Alessio and Kelen 2004). As a result, the restrictive chiefly protocols of canoe-building had thoroughly loosened. This enabled a second shift that involved the possibility of sharing Rongelapese navigational knowledge beyond family lines of inheritance. To restore the social and cultural health of their fragmented community, the Rongelapese discussed the construction of a community centre on Majuro in the late 1990s. They envisioned that Rongelapese elders would instruct the youth about their customs, history, land rights and traditional knowledge, especially canoe-building and navigation (Johnston and Barker 2008). Plans to build the community centre stalled, but in 2003 Joel, as the presumed last navigator, accepted the responsibility of resurrecting the nearly lost art of wave navigation.

Joel faced a paradox in the use of his Rongelapese knowledge. At the start of the revival project in 2005, Joel faced a paradox relating to his use of Rongelapese knowledge (Genz 2011). Any attempt to document and revitalise navigation ran the risk of re-contextualising his traditional knowledge and eroding its relationship to chiefly authority, and it is precisely such chiefly regulation that had continued to give navigation its particular cultural significance. They needed other Marshallese, in addition to Rongelapese, to build a voyaging canoe and they recognised my ability as a researcher to facilitate the documentation—two outside entities that could disrupt the secrecy of Rongelapese knowledge. While ancient chiefly potency had been undergoing substantial change over the past 150 years (Carucci 1997), the

tight link between navigation and chiefly power that constrained Joel's ability to share his knowledge in 2005 seems to have been in place at least half a century earlier when he began learning on Rongelap. Nonetheless, for nearly five decades he felt an obligation to maintain the navigational knowledge within his family in deference to his *iroij*; he would not risk damaging his relationship to his *iroij* by violating the chiefly protocols. In response to Joel's dilemma, the chiefs gave Joel and others from Rongelap permission to share their navigational knowledge with Kelen, an extended family member from Bikini who would serve as Joel's apprentice navigator and who was already trained in ethnographic documentation. Kelen would thus retain the knowledge, while also serving as a conduit for sharing information with other Marshallese and academics.

Even with Kelen's unique positioning, the knowledge has remained highly secretive, carefully hidden and strategically linked to the power of the *iroij* (Genz 2011). The virtual cessation of long-distance canoe travel in the Marshall Islands has not automatically fostered the impetus to share the extant knowledge. In fact, it has worked to maintain and possibly elevate the prestige of navigation from earlier times precisely because it is so rarely used today. The biggest challenge Joel, Kelen and I faced was the enduring value placed on navigation, as demonstrated by a concealment of knowledge. For instance, sentiments of losing one's identity as a navigator were so strong that some elders preferred, against the directive of their chief, to not share their knowledge. Retaining the knowledge affords the prestige of elite navigator status for one's lineage, clan and atoll community. The offset of this is that the knowledge is clearly at risk of being lost forever with the passing of its last custodians.

A tension exists between respecting chiefly restrictions on who can share navigational knowledge with whom, and the diminishing or elevating of status and prestige. Kelen and I worked with Joel who, after nearly half a century of waiting, finally received chiefly permission to prepare for his inaugural sea trial. Yet Joel's Rongelapese elders showed various degrees of reluctance to share their knowledge with him. Amidst this somewhat tense atmosphere, Joel continued his shore-based learning over the course of a year. He sought to finalise his understanding of wave navigation, which included learning about the waves from a Western scientific perspective (Genz *et al.* 2009). His growing comprehension led to a voyage at sea after 2006, which served as his *ruprup jōkur* test to finally "break the shell" and become a formally recognised navigator.

In preparation for this voyage, Waan Aelōn in Majol built a 11 m outrigger voyaging canoe named *Jitdam Kapeel*, which translates as "searching for experiential knowledge" and proverbially means "seeking knowledge guarantees wisdom" (Stone *et al.* 2000). The canoe would serve as an

experiential learning platform for the navigator apprentice and his sailing crew, allowing them to begin to absorb the embodied knowledge of wave movements under Joel's direction. This sea-based training would be a fundamental step to pass on Joel's knowledge. The canoe, however, required substantial repairs to its hull and outrigger complex at the time of the voyage. We enlisted the help from two sailors stationed on Kwajalein, who allowed Joel to navigate their sloop-rigged 11-m yacht 190 km directly westward to the small atoll of Ujae, with the requisite condition that we cover the compass with duct tape and stow the other navigational instruments.

The 2006 voyage between Kwajalein and Ujae served as Joel's belated *ruprup jōkur* test to become a navigator, and a research opportunity for Kelen and myself to learn about the rhythmic motions of the sea (Genz 2014). Constrained by U.S. military clearance for entry onto the Kwajalein base, our only opportunity to sail was during the remnants of a severe storm. A strong wind-driven swell from the west masked the more subtle wave patterns. While knowledge of storm-generated wave patterns typically comprises part of the navigational toolkit among surviving Pacific navigation traditions (Lewis 1994), Joel had not received formal training about such conditions. Midway to Ujae Joel vainly searched for the expected island-induced wave patterns, but an inadvertent spotting of the tops of the coconut trees of the tiny atoll of Lae close to our target destination indicated to Joel that he had navigated correctly despite not detecting any of the wave signatures. The fact that this moment was his intellectual transformation of *ruprup jōkur* became clear a few days later, after his newfound sense of confidence and direct return route to Kwajalein (Genz 2015).

Joel had just "broken the shell" to become a recognised expert on navigation (*ri-meto*) throughout the Marshall Islands. Headlines in the local newspaper confirmed with the sailors and broader community what they had long suspected—that Joel could navigate by the waves and that he was among the very last of the "real captains". The only other titled *ri-meto* was an elderly navigator on Ujae who recognised that Joel alone had both the knowledge and physical stamina to traditionally navigate at sea. With Joel attaining the chiefly-sanctioned title of navigator, he was now in a position to formally train Kelen as his apprentice. However, Kelen knew he was not yet ready for his own *ruprup jōkur* test. We had already talked at length with elders about their interpretations of their stick chart models (Genz 2016), but what Kelen really needed was sea experience under Joel's guidance. Kelen and I began planning a northern trip of 100 km from Majuro to Aur as a navigational exercise, one we attempted in 2007 and 2009. Unfortunately, these planned voyages were precluded by Joel's diminishing health. Kelen, as the apprentice navigator, found a way to undertake this voyage, which involved an unusual and unprecedented shift in how navigational knowledge is used and passed on.

REVIVAL (PHASE 2)—THE APPRENTICE

Lacking precedent, the second phase of the revival project (2010–2015) involved an apprentice acquiring and demonstrating navigational knowledge without the guidance of a master navigator. This started for Kelen in May of 2010 when *Jitdam, Kapeel* made her first open-water crossing from Majuro to Aur and back under sail with strong winds. The crew faced high wind-generated seas that were part of the normal ending of the windy *añōneañ* season. With 30-knot winds blowing from the east, the canoe could track northward to Aur on an ideal beam-reach without the need for shunting. Joel, with recovering health, did not feel up to the task of sailing on the canoe. In fact, a wind advisory for all crafts was in effect, but Kelen was intent on making the journey. His team of canoe-builders had coated the hull with fibreglass for extra strength and built airtight compartments in the bulkheads to produce a virtually unsinkable vessel. Despite Kelen's confidence in the structural integrity of the canoe, Joel cautiously decided to stay aboard the escort vessel while Kelen commanded the canoe with six experienced sailors. Kelen suggested that Joel audibly guide the canoe through VHF (very high frequency) radio communication.

The 2010 Aur voyage, however, did not unfold according to the plan. Shortly after departure Kelen's handheld VHF radio on board the canoe malfunctioned as a result of depleted batteries. Despite the lack of communication between the vessels, Kelen successfully guided *Jitdam, Kapeel* to Aur and back to Majuro:

Captain Korent [Joel] was still very weak from his sickness, and had to be helped on board the escort vessel. The plan was for Captain Korent to radio directions to me on board the canoe. We got to the pass leading out of Majuro around midnight, with blowing winds and white capping seas.

I radioed to Captain Korent to give me the swell to Aur, and he said, "No. It was too rough and the trip should be aborted." I told Captain Korent that I wanted to test the canoe, as it had never before sailed in the ocean. I reminded the crew that it was reinforced with fiberglass and had airtight bulkheads, so that it could not sink.

The distance between Aur and Majuro is 60 miles [100 km], and we would have made it to Aur by sunrise but we had to repeatedly wait for the escort vessel during the night. At about nine o'clock in the morning we spotted the first signs of Aur.

This trip strengthened Captain Korent. He had to be helped on board the escort vessel by hand, and I told the other captain to not let him do anything. But by the time we had completed the trip, Captain Korent's health had returned and he was doing some of the work, such as dropping the anchor. I couldn't believe it, but then I realized that Captain Korent was a person of the ocean, and that is where he belonged. If such a person stays on land too long, their health begins to deteriorate. (Kelen 2014)

Kelen was now on his way to being the link between the ancestral knowledge, embodied in Joel, and the future generations of sailors under his tutelage at Waan Aelōñ in Majol. But Kelen's journey toward becoming a recognised navigator faced yet another setback involving, once again, illness and a shift in the protocols of using navigational knowledge.

Kelen and I invited John Huth, a particle physicist at Harvard University, and Gerbrant van Vledder, a wave modeller from Delft University in the Netherlands, to accompany Joel on a voyage to better understand an enigmatic island-induced wave transformation. We planned a return voyage from Majuro to Aur, with Joel remaining on the escort vessel to radio navigational information to Kelen on board the canoe. Kelen and the sailing crew would gain experience, while Joel would demonstrate to the scientists the waves he was using to pilot the escort vessel toward Aur. Heightening the significance of this journey was coverage by the *New York Times* magazine. A writer and photographer came to document this collaborative, interdisciplinary search for the waves that would finally, in Joel's mind, validate the idea of wave piloting. Days before their arrival in Majuro, however, Joel developed an infection in his leg, which, complicated by diabetes, later resulted in amputation (Fig. 2). Without Joel, Kelen's options narrowed. We considered Eknilang, but he downplayed his abilities by stating he “would get us lost.”



Figure 2. Captain Korent at his home in Majuro, looking at a wave map prepared by physicist John Huth. Photo courtesy of Mark Peterson/Redux, 2015.

Without a navigator, one emerging option was to conceptualise the voyage as a training exercise for Kelen and the sailing crew on how to handle the canoe on the open ocean. Kelen decided he would lead the canoe as the navigation apprentice, absorb as much information from the ocean as possible, and relate this to Joel upon our return. Three independent GPS (Global Positioning System) units aboard the escort vessel would provide navigational help if he needed it.

This breach of protocol in the use of navigation had no precedent. This was certainly not Kelen's *ruprup jokur* navigation test. If pushed, he would admit to others that he was a navigation apprentice, but he preferred to avoid any suggestion of his growing knowledge of the waves. When talking with the community, he prefaced the discussion with the notion that he would be "guessing" along the way. Taken at face value, it would appear that he would in fact be trying his best to work it out. But being humble when discussing one's knowledge is a distinctive Marshallese form of communication. By telling others that he would be guessing the location of the canoe, the elders in the community might conclude that he did in fact know how to navigate. Since this was not meant to be Kelen's moment, he would simply tell people, when asked, that he and the sailing crew were on a fishing trip, and "guessed" their way to Aur.

The canoe left the protected lagoon waters of Majuro on 17 June 2015, with 20-knot easterly winds generating a strong easterly swell (Fig. 3). As we continued to sail a northern route, the stars were clearly visible, with sightings of Limanman (Polaris) ahead and, facing astern, the southern position of the kite asterism Limaaakak (the Southern Cross). The stars remained visible throughout the journey, but the waves became so steep that Kelen could not discern the more subtle patterns that would have indicated the path toward Aur. He steered the canoe as close-hauled to the wind as possible, estimating that the canoe would arrive just windward of the atoll.

Just before dawn, Kelen described our position over the radio, which was the exact position displayed on the GPS map in the cabin of the escort vessel. We were about 15 kms southeast of Aur. We sighted the atoll mid-morning and ultimately made landfall on the islet of Tabal on the northern part of the atoll. With no discernible wave patterns, Kelen had impressively determined his location from a solitary focus on back-sighting Limaaakak and maintaining a tight angle to the wind. Compared to the outbound voyage, the sea and wind during the return voyage to Majuro afforded excellent sailing. Gently rolling swells from the east with light winds under 10 knots characterized most of the voyage, and Kelen guided the canoe in a slight arc back to Rongrong, the farthest northwestern islet of Majuro. Aboard the canoe, the sailing crew began quietly referring to Kelen as "captain," the adoption of the English word that means Marshallese navigator. And while the residents on the island of Tabal on Aur admired Kelen for guiding *Jitdam Kapeel* to their shores, in



Figure 3. *Jitdam Kapeel* departing Majuro. Photo courtesy of Mark Peterson/Redux, 2015.



Figure 4. Apprentice navigator Alson Kelen speaking at our ceremonial welcome to Tabal, Aur, with (from left to right) oceanographer Gerbrant van Vledder, physicist John Huth and author Joseph Genz. Photo courtesy of Mark Peterson/Redux, 2015.

his public speech at our ceremonial reception he downplayed his navigational accomplishment with humility. Reflection on his navigation as guesswork likely cemented for the sailing crew that he was in fact their captain (Fig. 4).

Without Joel, we were still not that much closer to understanding an enigmatic wave pattern that extends between atolls, although the accompanying physicist and oceanographer gained adequate experience to begin to revise their computer models and simulations. These paths of waves may be the result of concentrations of reflected wave energy that often link pairs of islands (Huth 2013; see also Genz 2016 for a synthesis of the techniques of Marshallese wave piloting). Importantly, Kelen began the process of internalising the feeling of these wave patterns. While he expressed his own doubts, the sailing crew placed trust in his ability to find the way:

In comparing the voyage of 2010 and this voyage of 2015, I tell people that the voyage now is way better than the first one. Before I had guidance from a captain. This time I was very scared because lives depended on me. I was trusted by many to guide us safely to Tabal and I cannot thank them enough for trusting me with their lives. As we sailed, there were a lot of obstacles and many dangers—dangers with the sea and with the rain, but they still trusted me. (Kelen 2015)

* * *

This story highlights the ways in which Captain Korent Joel and his apprentice navigator Alson Kelen symbolically embody both the century-long decline and the recent resurgence of traditional open ocean navigation. Joel's quest to relearn his Rongelapese ancestors' methods of navigating by the waves is a testament to the resilience and adaptability of tradition. The US nuclear testing distanced Joel and his relatives from "breaking the shell" for nearly half a century. While the Rongelapese continue to live as exiles from their irradiated home islands, Joel's journey to becoming a titled navigator has strengthened the community's ancestral identity as a "people of the sea." In the process of imparting tightly held knowledge to Joel, the Rongelapese custodians of navigational lore lost some of their prestige; however, some of that has recently been recouped with the interest of outside scientists. Complicating these dynamics of the enduring power of navigational knowledge is the unprecedented shift in the protocols of navigation. The 2010 voyage of *Jitdam Kapeel* did not breach the chiefly protocols since technically radio contact afforded Joel the ability to relay directions to Kelen; however, the 2015 voyage was undertaken by an apprentice with no teacher present—the only time this has happened in the Marshall Islands in living memory. Kelen's justification for this shift centred on cultural survival.

The ability to deftly negotiate the waning but still powerful traditions in the face of emerging environmental and social issues is paramount for the continuation of this wayfinding knowledge; such knowledge, grounded in a deep ancestral past, can also be invoked to confront those challenges. The Marshall Islands are projected to be among the first nations in the world to experience the synergistic impacts of climate change: the effects of sea-level rise on coastlines and the quality and quantity of freshwater resources; coral reef degradation; diminished agricultural sustainability; and various impacts on human health (Australian Bureau of Meteorology and SCIRO 2014; Campbell 2014; Nurse *et al.* 2014). The Marshallese are examining ways to stay on their island, options to relocate, and legislative measures to mitigate global emissions and concentrations of tropospheric greenhouse gases. In particular, the Majuro Declaration of 2013 captured the political commitment of Pacific Island nations to transition to renewable and sustainable energy in order to keep global warming below a 1.5 °C threshold (Majuro Declaration 2013). The Marshallese government is looking for ways to reduce its national energy expenditure, 70 % of which went to sea and air transportation in 2013.

Kelen, as the director of Waan Aelōn in Majol, envisions a return to sustainable sea transport as a way to lessen dependence on fossil fuels. As part of an emerging broad initiative called the Micronesian Sustainable Transport Center, Kelen aims to construct a fleet of wind-propelled canoes that could transport materials and people throughout the archipelago rather than rely on government transport ships. Also, gasoline costs on the outer atolls reached \$10 per gallon in 2015. Waan Aelōn in Majol has helped some of these local communities build traditional outrigger sailing canoes and modern catamarans to transport copra locally across the lagoons without the prohibitively expensive fuel costs (Alessio and Kelen 2004). Consistent with the 2013 Majuro Declaration and other regional policies, inter-atoll traditional voyaging canoes, along with innovative technologies would assist the Marshallese government in achieving its policy target of reducing its transport emissions (Newell *et al.* 2016; Nuttal 2015; Sustainable Sea Transport Research Programme 2015). Canoe transport would reduce socio-economic vulnerability to external rises in oil prices and direct the nation toward increasing energy independence, as well as lowering carbon emissions in the global mitigation of climate change (Sustainable Sea Transport Research Programme 2015). Kelen's explorations of traditional voyaging with modern technology—fibreglass hulls, internal buoyancy devices, radio-assisted navigation and GPS—are well suited to contemporary Marshallese society with its selective invoking of the past. Other initiatives throughout the Pacific are more symbolic. For instance, the Polynesian Voyaging Society's current Mālama Honua Worldwide Voyage is using *Hōkūle'a* to raise

global awareness of nurturing sustainable environmental practices based on indigenous principles (Polynesian Voyaging Society 2016). But deploying a fleet of traditional voyaging canoes might give the Marshallese an edge as they confront the emerging realities of climate change.

Such a cautiously optimistic glimpse into the future of voyaging in the Marshall Islands must recognise the continuing power and prestige of voyaging and navigation. With Joel's recent passing, a question arises about the enduring but shifting value of chiefly protocols in the use of Rongelapese navigational knowledge. To what extent can traditional chiefly knowledge and ownership of knowledge accommodate the new reality that the revitalisation of Marshallese voyaging and navigation now rests with an untested apprentice who no longer has the guidance of a titled navigator? Local celebrations and chiefly support of the unprecedented 2015 Aur voyage suggest that it is possible to strike a balance between honouring the traditions of chiefly authority and recognising the innovative capacity of Waan Aelōn in Majol leadership. This may in fact be the only viable path toward the cultural revitalisation of Marshallese voyaging.

ACKNOWLEDGEMENTS

This article is based on the results of a collaborative cultural revitalisation project between the University of Hawai'i and the Marshallese community organisation Waan Aelōn in Majol (Canoes of the Marshall Islands). The research, approved by the University of Hawai'i Institutional Review Board and permitted by the Marshall Islands Historic Preservation Office, spanned two phases. The initial phase of the research (2005-2009) was funded in part by a grant/cooperative agreement from the National Oceanic and Atmospheric Administration, Project #R/EP-27, which was sponsored by the University of Hawai'i Sea Grant College Program, SOEST, under Institutional Grant No. NA05OAR4171048 from NOAA Office of Sea Grant, Department of Commerce. The views expressed herein are those of the author and do not necessarily reflect the views of NOAA or any of its sub-agencies (UNIHI-SEAGRANT-JC-06-07). This first phase of research was also funded by the National Science Foundation under Grant No. 514594, the Wenner-Gren Foundation for Anthropological Research, Inc. under Grant No. 7282, Mobil Oil Micronesia and the U.S. Ambassador's Fund for Cultural Preservation. The second phase of research was funded by a University of Hawai'i at Hilo seed grant, the U.S. Ambassador's Fund for Cultural Preservation, the National Geographic Society's Genographic Legacy Fund and the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Participation Programme. I would like to acknowledge Iroiĵlaplap 'Paramount Chief' Imata Kabua and Iroiĵ 'Chief' Mike Kabua for granting permission to conduct the research; Captain Korent Joel and other elders for generously sharing their knowledge; and Alson Kelen, Dennis Alessio and other members of Waan Aelōn in Majol for facilitating and participating in the project. I am also very appreciative of the insights provided by two anonymous reviewers.

NOTES

1. I use the older spellings of place names for ease of recognition but follow the new orthography as reflected in the Marshallese dictionary (Abo *et al.* 1976) for the spellings of Marshallese terms.
2. Here and throughout the article I use the real names of my Marshallese collaborators in accordance with their expressed wishes.
3. Here and throughout the article I recognise the problematic nature of inferring demonstrable occurrences from narratives. It is possible that these narratives may be highly politicised renderings of the world, and many factors impact the memories and retellings of events such as how collective memory may influence an individual's recollections (Yow 2015). However, my key Rongelapese consultants have remained quite consistent over time in their narrations of Litarmelu and the Rongelap training school, and other consultants grounded in geographically distant navigation traditions in the Marshall Islands similarly recognise the importance of the Litarmelu and Rongelap-centred traditions.

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ABSTRACT

The cultural revitalisation of voyaging in the Marshall Islands is gaining momentum under extraordinary social conditions involving shifting protocols in the use of navigational knowledge. The first phase of the project (2005-2009) facilitated an elder from Rongelap in achieving the social status of a titled navigator, a process that involved delicate negotiation between chiefly permission to share knowledge and the resulting loss of meaning and prestige. For the first time, the sharing of the Rongelapese knowledge extended beyond direct family lines of inheritance to an apprentice navigator. The second phase of the project (2010-2015) involved the apprentice undertaking a voyage without the guidance of the master navigator. I contend that an apprentice navigator demonstrating his prowess without the teacher is unprecedented under the enduring chiefly protocols on the restricted use of specialist knowledge in the Rongelapese community, but that such a shift in etiquette might be the only viable path to ensure cultural survival amidst encroaching environmental and social impacts.

Keywords: traditional navigation, Pacific voyaging, indigenous knowledge protocols, cultural revival, nuclear test effects, Rongelap Atoll, Marshall Islands

CITATION AND AUTHOR CONTACT DETAILS

Genz,¹ Joseph H. 2017. Without precedent: Shifting protocols in the use of Rongelapese navigational knowledge. *Journal of the Polynesian Society* 126(2): 209-232; DOI:<http://dx.doi.org/10.15286/jps.126.2.209-232>

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