Wayfinding:

Finding my way, learning traditional navigation

Introduction

I grew up in West Auckland, New Zealand, in an education system that taught that the traversing of the Pacific (by the people who lived in the islands of the Pacific) was by way of paddling canoes, and that the discovery of islands was by sheer fluke. That narrative was given as the rationale for the stereotype that all people of the Pacific were (and are) 'big and strong'. In many respects, it was the reason why I took up *waka ama*[1]*;* it was a chance to connect to my Pacific roots. In 2010, while undertaking my masterate studies, I read Salesa (2004), whose account of traditional Pacific voyaging and navigation made an indelible impression on me. One of the most impactful moments of Salesa's exposition was a rendering of an encounter between Captain Cook and a Tahitian war party on 'war canoes'. There was an 'awakening' of a curiosity (about the Tahitian war party and their canoes) that compelled me to look further into that encounter. I came across Kane's (2006) description of Captain Cook's encounter with the Tahitian war party, and became completely absorbed by the imagery. That which Captain Cook had called a 'war canoe', the Tahitians called a *pahi*. In contrast to Captain Cook's tall ships – broad-bottomed mono-hulls with three masts and multiple sails – the *pahi* was a double-hull, with two masts, and two (large)sails, capable of carrying up to 150 people. The Tongan version of such a craft is the *kalia* and the *tongiaki*; the Sāmoan version, *'alia* and the *va'atele*; the Cook Island version, the *vaka katea* and the *vaka moana*; the Māori, *waka hourua*; the Hawai'ian, *wa'a kaulua*; the Fijian, *drua*; the *pahi* is a common type of sea vessel in the Pacific where each island nation have their own traditions of such vessels[2]. Captain Cook also noted that the *pahi* was propelled under 'sail power', not 'paddle power', contrary to what I had learned through the New Zealand education system. And whereas common European sails at the time were either quadrilateral or triangular in shape, the sail design of the *pahi* was described as a 'crab-claw' design. Lewis (1972, 1978) and Beaglehole (1974)[3] recount that Captain Cook instructed the *Resolution* to pull up alongside a *pahi* and noted that the *pahi* was longer than the *Endeavour*[4] – for comparison's sake, the *Endeavour* is approximately the length of a basketball court. Captain Cook wanted to test the *pahi* for speed and was astounded that the *pahi* outsailed his ship; for every two miles the *Resolution* sailed, the *pahi* sailed three; the *pahi* was not only bigger (than the *Endeavour*), but also faster (than the *Resolution*).

I was in disbelief, learning of this encounter. I could not comprehend the level of complexity and skill required to construct such 'war canoes', and I marvelled at the sophistication and genius behind their construction. Moreover, I was in disbelief that 'natives' – like me – were capable of constructing such complex sea crafts with seemingly 'primitive' materials and knowledge. To this, Salesa noted:

> Evidently, it is not hard to make the case that Pacific Island societies had extremely developed maritime knowledge and technology. When Europeans first came into the region (mostly in the 17th and 18th centuries), Pacific Island societies from the Marianas to New Zealand possessed a variety of seacraft and a wealth of ocean knowledge. Most of the ocean-going vessels were either catamarans or outriggers, ships which showed meticulous hull and sail design, and had impressive speed and handling. Early Europeans and American voyagers were surprised by these vessels, not only because those who built them were seen as illiterate and heathen, but because they were constructed without any metal tools or material. How was it that mere 'savages' could design, build, sail and navigate such vessels? (p. 4)

[1] *Waka ama* – (Māori) Outrigger canoe (racing).

[2] Haddon & Hornell, 1975; Howe, 2006; Lewis 1972, 1978

[3] See also Salesa, 2005

[4] Although the comparison is with *HMS Endeavour* – the ship that Captain Cook used for his first voyage – this particular encounter was on Captain Cook's second voyage, which was on *HMS Resolution,* a slightly larger ship. Beaglehole (1974) uses *Endeavour* for the sake of comparison.

Upon further reflection, I came to recognise the degree to which my understanding of the Pacific had been fashioned to me by non-Pacific teachers, historians, and the education syllabus; I knew so little about the complexity, sophistication and scientific innovation of Pacific people, and Pacific history. The conclusion I reached was definitive: we must tell the stories about ourselves, ourselves. This moment of discovery was the motivation to continue to learn about traditional navigation, but from a performative perspective, rather than an academic exercise, or through the literature; I felt that it was necessary that recovering and uncovering this ancient knowledge needed to be undertaken performatively.

After I completed my masterate studies, I continued on to my doctorate studies, and in 2014, I moved to Sāmoa to undertake the research: I was searching for a Sāmoan approach to coping with adversity through Sāmoan oral traditions, the *tatau*[5]. While undertaking the research, I had a short conversation with one of the *Tufuga Tā Tatau*[6] who stated that everything on the *tatau* corresponded to various aspects of traditional navigation. After that startling revelation, I set about recording my learning about traditional navigation, and although I did not add traditional navigation to my doctoral thesis, I continued to document the learning.

This paper then, describes (the beginnings of) my journey to learning traditional navigation and voyaging. For the sake of a research methiodology, to carry out this learning, I took the key lessons learnt from cultural anthropologists, George Murdock (1897-1985), Bronislaw Malinowski (1884-1942) and Clyde Kluckhohn (1905-1960). These anthropologists adopted a type of ethnography by cultural participation and immersion; they espoused the richness of insight and understanding as well as the academic integrity and rigour achieved when a typically traditional ethnographic approach is coupled with researcher cultural participation, which allowed them to gain 'insider insight' while still possessing an outsider's theoretical perspective. This moved them from outsider anthropological observer/researcher to a more personal enquiry. In many respects, it is ethnography by immersion and reflection, and as attested to by many indigenous researchers, is ideal for searching for hidden and lost knowledge, and in search of rich and evocative narratives.

Background

The concept of 'traditional navigation' refers to the art of oceanic navigation used by the indigenous peoples of the Pacific. It is a privileged point of entry for studying Pacific indigenous knowledge; the ocean was a foundational part of everyone's lives, as well as histories and genealogies[7]. The significance of the ocean can be seen in a publication by Koshy et al. (2006), the ocean is described thus: "In this 'sea of islands' where the ocean exceeds land masses by an average factor of 300 to 1 . . . the people of the Pacific have developed a unique relationship with the ocean that has shaped their sense of place, their economies, and their culture" (p. 270). Gladwin (1970) described oceanic traditional naviagtion as "a system of interisland navigation which is complex, rational, efficient and almost entirely non-European in origin. It is taught as a logically coherent system" (p. preface). Salmond (2005) stated:

> According to current scholarly accounts, they came in a great migration . . . perhaps 5,000 years ago, rapidly moving . . . across the Pacific from island to island, and preceding the Viking oceanic explorations by about 2,000 years. This system of long-range exploration and settlement was made possible by fast, durable outrigger or double canoes, carrying perhaps 50 people or more and supplies for some weeks, a portable biota and a viral kinship system. Rather than a system of long-distance control, this was a system of exploration and settlement by kin-based replication. (p. 169)

Traditional navigation has also been referred to in the literature as 'non-instrumental navigation', 'wayfinding', 'landfalling', and used synonymously with 'Polynesian/Micronesian/Pacific navigation' and 'celestial navigation'. Moreover, as Salesa explained, traditional knowledge pertaining to maritime navigation was a point of intersection of many different bodies of knowledge: "of the sea, coast, and reef; of flora and marine

[5] *Tatau* – (Sāmoan) Traditional Sāmoan tattoo

[6] *Tufuga Tā Tatau* – (Sāmoan) Traditonal Master Tatooist

[7] Evans, 2011; Finney, 2003; Irwin, 1992; Lewis, 1972; Pyrek, 2011; Salesa, 2004

and avian fauna; of the environment; of weather; of the movements of heavenly bodies; of the movement of things through sea and sky; of the organization/ conceptualization of space or geography; of food technology" (p. 2). Furthermore, Watson-Verran & Turnbull (1995) added:

> The Pacific navigators combined knowledge of sea currents, marine life, weather, winds and star patterns to form a sophisticated and complex body of natural knowledge. This knowledge system combined with their highly developed technical skills in consrtucting large seagoing canoes enabled them to transport substantial numebrs of people and goods over great distances in extremely hazardous conditions and to establish autonomous communities on distant isalnds – communities that were nontheless able to return and maintain their cultural links. (p. 123)

Additional to the aforementioned bodies of knowledge, a significant part of the body of knowledge of traditional navigation is the art of celestial navigation, navigating by the stars and other heavenly bodies. Master Navigator, Nainoa Thompson[8], described it thus:

> At night we use the stars. We use about 220 by name -- where they come up, where they go down. When I came back from my first voyage as a student navigator from Tahiti to Hawai'i, the night before he went home, Mau took me into his bedroom and said, 'I am very proud of my student. You have done well for yourself and your people'. He was very happy when he was going home. He said, 'Everything you need to see is in the ocean, but it will take you 20 more years to see it'. That was after I had just sailed 7,000 miles.

World renown anthropologist/ethnobotanist Wade Davis, in a series of lectures[9], began his lecture with this statement:

> I want tonight to take you on some of these journeys that were so extraordinary. And let's begin by entering the largest culture-sphere ever brought into being by the human imagination: Polynesia. Tens of thousands of islands flung like jewels upon the southern sea. The greatest culture-sphere in the history of humanity" (20:08), adding that "Indeed, if you took all of the genius that allowed us to put a man on the moon and applied it to an understanding of the ocean, what you would get is Polynesia (21:48).

Moreover, the series of lectures gleans from an earlier publication of his, where Davis (2009) stated:

> The science and art of navigation is holistic. The navigator must process an endless flow of data, intuitions and insights derived from observation and the dynamic rhythms and interactions of wind, waves, clouds, stars, sun, moon, the flight of birds, a bed of kelp, the glow of phosphorescence on a shallow reef – in short, the constantly changing world of weather and sea. (p. 60)

Additional to the science behind the art of navigation, there is also considerable science and technology behind the mechanics, the aerodynamics and the hydrodynamics in the body of knowledge associated with 'canoe' construction, of transferring wind energy into motive energy through the hulls, and the functionality of the outrigger and the steering paddle in balancing the vessel's proclivity to heeling and yawing[10]. To record and access this body of knowledge, mental models, or cognitive constructs, were used – for example, stick charts, starpaths (also called star compass), gourds, chants, even the sea vessel itself[11]. Moreover, Malo (1898) detailed the construction of a voyaging canoe, being that of a communal, village-wide affair.

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[8] https://www.pbs.org/wayfinders/wayfinding2.html

[9] Davis (2013) is a video presentation at the Oregon Humanities Centre based on his book, Davis (2009). The excerpts cited are the time stamps from this video: https://www.youtube.com/watch?v=Fk7bqPr5OjA&t=1160s

[10] See Howe, 2006; Irwin, 2008; Finney, 2006; Pyrek, 2011; Salmond, 2005; Wharram & Boon, 2006

[11] Finney; George, 2013; Howe, 2006; Lewis, 1972, 1978; Pyrek, 2011; Salmond, 2005

Lost and found

Alas, for cultures whose knowledge base – viz. education system – is predicated on performative and oral traditions, it relies on customs and traditions of 'talking' and 'performing'. However, once you stop talking and performing, you start forgetting[12]. For the many peoples of the Pacific, the 'forgetting' (viz. *erasure* of traditional knowledge) started with the arrival of the missionaries, which was the precursor to colonisation[13].

I will not offer a critique of 'The West' and its influence in the Pacific as this is outside the scope of this paper, but it is necessary to draw attention to the fact of The West's colonial past because the erasure and the marginalisation of indigenous knowledge and practices[14] and the present-day obscurity of traditional navigation knowledge emanates from this colonial past. To this, Thong (2012) stated:

> 'Westernization' refers to the influence of Western ideas, values, and practices on the non-Western world. 'Westernization' . . . 'is reconstructing or shaping the rest of the world on western norms and institutions'. It is, in many cases, supplanting native culture with Western cultural values and practises. More specifically, the term here refers to colonial and missionary attempts at wholesale assimilation . . . . all colonized people suffered a similar outcome in their encounter with the West. (p. 894)

Gunson (1993) also noted:

> We know, also, that in the era of European contact many Christian converts who were the custodians of traditional knowledge deliberately suppressed much of this material because the narratives and songs celebrated ways of life and relationships which they not only felt would be offensive to European Christians but which they wished to forget themselves. The missionary David Darling actually destroyed a history of the Arioi society of Tahiti, which he had assembled because he found it repugnant to his conscience. (pp. 140-141)

The result of colonisation and missionisation in the Pacific was the erasure of traditional knowledge; gleaning from many of the missionary and colonial diaries and reports, traditional navigation has not been practiced for approxiamtely 150 years. It is in this absence of practice and oratory exchange that some European anthropologists of the early 20th century proffered the explanation of the concept of traditional navigation as myth and fable, rather than science and technology. Among them, famed adventurer/ethnographer Thor Heyerdahl (1914-2002), who could not accept that 'primitive' Polynesians deliberately navigated their 'primitive' sea vessels around the Pacific Ocean to discover every inhabitable island. He promoted the theory that the islands were discovered *accidentally*, by serendipitously drifting on the ocean's currents[15]. To prove his premise, in 1947, Heyerdahl constructed a balsa raft, *Kon*-Tiki, and set out from a beach in Peru, and after 101 days drifting at sea, he arrived at a reef in the Tuamotu archipelago, approximately 7000km away. He believed that he had proven his theory of Polynesian accidental drift[16].

Moved by Heyerdahl's 'experiment', Sharp's (1956, 1961, 1963) tome continued to denigrate the then-common belief of the ancient Polynesians being great seafarers, who had intentionally explored the Pacific, and purposefully settled the many islands. Moreover, and of greater concern, Sharp's explanations appealed to many "who could not imagine how Stone Age people without ships, compasses, charts, and other navigational aids" could have achieved such a feat (Finney, 2003, p. 8).

Ben Finney (1933-2017), an American anthropologist living in Hawai'i, had become familiar with traditional voyaging and navigation, and David Lewis (1917-2002), a New Zealand retired physician, returned to his love of the sea and undertook research on traditional navigation through performativity, raised their objections to

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[12] Brannen, 2013; King, 2005; Mercer, 1979; Vansina, 2006

[13] See Brannen, 2013; King, 2005; Mercer, 1979; Salmond, 2003, 2005; Tangwa, 1999; Thong, 2012; Vansina, 2006; Williams, 1984

[14] See Gunson, 1993; Salesa, 2005; Tangwa, 1999; Thong, 2012; Williams, 1984

[15] Heyerdahl, 1941, 1950

[16] Heyerdahl, 1950, 1973

Sharp and Heyerdahl. This was the 'main event' of the 'accidental drift versus traditonal navigation' debate. To this, Finney's conclusion was definitive:

> As I followed the ensuing debate, I realized that the issue could not be resolved with the information at hand. It hinged on how well the old canoes sailed and how accurate were the traditional methods of navigation. Yet the main sources on Polynesian voyaging then available – migration legends and explorers' reports – did not provide precise enough information to settle the issue. We needed the actual double-hulled canoes, but they (and their navigators) had long ago disappeared from Polynesian waters. The only way to get the needed information was to reconstruct the old canoes and ways of navigating and then test these over the legendary sea routes of Polynesia. (Finney, 2003, p. 8)

Thus, the inception of the movement to restore the knowledge, and revive the art, of traditional navigation. It began in 1974 in Hawai'i, with the designing and making of a twin-hulled 'voyaging canoe' named *Hokule'a*[17], and their maiden voyage to Tahiti in 1976[18]. From the outset of the venture, Finney and Lewis agreed that the involvement of indigenous peoples was critical. To that end, a Micronesian Master Navigator, Mau Piailug, was brought in. Low's (2013) account of the constuction of *Hokule'a,* the involvement of Mau Piailug (1932-2010), and his training of local Hawai'ian, and aspiring-Master Navigator, Nainoa Thompson, is necessary reading for the full picture of this venture. The success of the inaugural voyage from Hawai'i toTahiti using traditional navigation (led by Piailug) sparked a revival in traditional navigation in Hawai'i, and more importantly, a resurgence in indigenous pride among the indigenous Hawai'ians[19].

The successful undertaking of this voyage was the impetus for the second significant voyage, *Voyage of Rediscovery*, 1985-1987. This voyage started in Hawai'i, went to Tahiti, then to the Cook Islands, and on to Aotearoa/New Zealand, before returning to Hawai'i. This voyage captivated the attention of indigenous Pacific peoples from those nations, and became the momentum that launched the third significant milestone voyage, *Te Henua Enana to Hawai'i* voyage*,* 1995, that Finney (2003) and Howe (2006) capture. For this third significant voyage, the Tahitians, the Cook Islands, and Aotearoa/New Zealand were invited to have their own sea crafts built, and join the voyage. For that 1995 voyage, ex-Premier of Cook Islands, Sir Thomas Davis (1917-2007), led the construction of *Te Au o Tonga*, and along with recently built, but smaller voyaging *va'a*[20], *Takitimu,* together made up the Cook Islands' entry for the voyage. In Aotearoa/New Zealand, a team led by Hekenukumai 'Hec' Busby (1932-2019) built *Te Aurere*, which was Aotearoa/New Zealand's entry. There were two Tahitian *va'a* designed for the voyage, but by the time of the beginning of the voyage, both of their *va'a* withdrew for various reasons. To add to the small fleet, three *va'a* from Hawai'i sailed to Tahiti: *Hokule'a,* recently built *Hawai'iloa* and newly built *Makali'i*. All *va'a* departed from their home nations to gather at Te Henua Enana in Tahiti, to then make the voyage to Hawai'i. The revival now well and truly under way.

Upon the completion of the third milestone voyage, Tahiti, Cook Islands and Aotearoa/New Zealand instigated their own revival and restoration movements. In 2008, a Cook Island contingent led by Sir Thomas Davis made their entry to the Pacific Arts Festival held in American Sāmoa on *Te Au o Tonga*. Present at this festival was a German philanthropist, Dieter Paulmann, who was besotted by the spectacle of the traditional voyaging *va'a*. After some negotiation with various island nations, his involvement was definitive. In 2009, he established *Okeanos Foundation*, and over the following 18 months, Okeanos funded the construction of seven traditional voyaging *va'a* modelled after *Te Au o Tonga* (refer *Image 1.1: The fleet constructed by Okeanos Foundation*). The first purpose of the construction of the seven was to undertake the *Te Mana o te Moana* voyage, 2011-2012 (refer *Image 1.2: The fleet getting ready for* Te Mana o te Moana *voyage*).

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[17] *Hokule'a* – (Hawai'ian) A word/name that means "star of joy" and is the zenith star for Hawai'I; 'Arcturus' in Western astronomy.

[18] Finney, 1979, 2003; Low, 2013

[19] Finney, 2003; Low, 2013

[20] *Va'a* – (Sāmoan, Tahitian) Traditional sea-going vessel; *waka* (Aotearoa), *vaka* (Cook Island), *wa'a* (Hawai'i).

Va'a	Country	Base	Organisation
Marumaru Atua	Cook Island	Rarotonga	Cook Island Voyaging Society
Te Matau a Maui	Aotearoa/New Zealand	New Plymouth	Te Matau a Maui Trust
Haunui[21]	Aotearoa/New Zealand	Auckland	Te Toki Voyaging Trust
Uto ni Yalo	Fiji	Suva	Fiji Islands Voyaging Society
Fa'afaite	Tahiti	Pape'ete	Tahiti Voyaging Society
Gaualofa	Samoa	Apia	Samoa Voyaging Society
Hinemoana[22]	Aotearoa/New Zealand	Tauranga	Hawaiki Rising Trust

Image 1.1: The fleet[23], constructed by Okeanos Foundation.
The fleet was built in this order between 2008-2010 and gifted (with conditions) to the respective nations.

After a period of training and preparation, all seven *va'a* assembled in Auckland and set sail in April 2011. From Auckland, they sailed to Tuamotu, Hawai'i and then to California to make a political statement at a climate conference in September. From there, they voyaged to Cocos Islands (Mexico), Galapagos Islands, Tahiti, Cook Islands, Sāmoa, Fiji and Vanuatu, before attending the Pacific Arts Festival in the Solomon Islands in August 2012[24]. Significant portions of the voyage were conducted under traditional navigation conditions where they switched off all Western navigation instruments[25] and relied solely on the skills of the Navigators, as they taught the next generation how to navigate traditionally.

Image 1.2: The fleet getting ready for the *Te Mana o te Moana* voyage[26].
From left to right: *Haunui, Te Matau a Maui, Uto ni Yalo, Fa'afaite, Hinemoana, Marumaru Atua, Gaualofa.*

[21] *Haunui* was originally called *Va'atele*, based in American Sāmoa. In September 2009, American Sāmoa, along with Sāmoa and Tonga, were devastated by a tsunami. *Va'atele* suffered severe damage and the American Sāmoa orgnaisation were unable to repair her. *Va'atele* was shipped back to Auckland for repairs, and subsequently bought by Te Toki Voyaging Trust, and renamed *Haunui. Haunui* is now based at the Maritime Museum in Auckland's Viaduct Basin where they operate a very active programme. Te Toki Voyaging Trust continue to use the original sails of *Va'atele* as a way of acknowledging the *whakapapa* (ancestry) of *Haunui.*

[22] At the writing of this paper, Te Toki Voyaging Trust took ownership of *Hinemoana.*

[23] An eighth *va'a* was built in 2012, *Hikianalia*, modeled after the seven, and given to the Polynesian Voyaging Society, based in Hawai'i.

[24] https://okeanos-foundation.org/vaka-motu/

[25] The construction of sea-going vessels are required to have secondary propulsion (engines, as well as sails), and equipped with GPS and VHF radio technology.

[26] Image courtesy of Cook Island Voyaging Society

It is here that this paper makes its entry. I am a part of a growing number of Pacific people inspired and moved to be a part of the restoration movement. As I got involved in learning traditional navigation, I found that very little remains of Sāmoan traditional navigation knowledge; I could not find knowledgeable Sāmoans in traditional navigation, and more importantly, the knowledge itself would be difficult to uncover and recover. One such example of this is the explanation of celestial navigation that I describe later in this paper. In that section, the lack of Sāmoan names of the stars, reveals that many of the Sāmoan names of the stars have been 'forgotten'. Thus, as the star movements were being described to me during the voyage, they were described using Western star lore. While the restoration movement of traditional navigation is in its infancy, using Western star lore has become acceptable as part of the process of finding the indigenous equivalents. Thus, the 'indigenous' version of traditional navigation here is in some cases a mixture of Western knowledge, and explanations of traditional indigenous knowledge. Moreover, what has become accepted as 'traditional navigation' today is described as a type of pan-Pacific knowledge. Mau Piailug explained that what is considered 'Micronesian' navigation is in fact a Western construct; the divisions of Micronesia, Polynesia and Melanesia are not indigneous constructions. Piailug added that the stars that they use in his islands are the same stars used by all of the nations of the Pacific (albeit with slightly different names); and not just the stars, but the whole art of wayfinding, navigation and *va'a* construction. Furthermore, Di Piazza (2010), Finney (2003), Gladwin (1970) and Lewis (1970) noted that what has been 'lost' among the Polynesians, the Micronesians have continued to observe, and the two navigational frameworks can be used interchangeably. Di Piazza stated that "there is no doubt that sailors of both regions used sophisticated mnemonic devices to arrange their knowledge of celestial (star course) and terrestrial geography (island bearings) into organised bodies of data" (p. 381). Lewis added:

> It is noteworthy that every Pacific navigational technique is found in both Micronesia and Polynesia and that differences appear to be due to local conditions. We do not seem justified on the available evidence in speaking of separate navigational systems in the two areas. (p. 435)

I relate the stories of the revival and restoration to make this observation: there is a plethora of research and literature on many aspects of the navigation techniques used by the people of the Pacific, but there is a marked difference between those who are 'observing' it (from the 'outside'), and those are 'learning' it (from the 'inside'). A rudimentary survey of the literature indicates that the literature 'pre-restoration' discusses techniques; much of the more current literature in the restoration period is not academic, but is to do with 'storying the journey' and 'the re-discovery'. The conclusion I reached was that traditional navigation is something to be *experienced*, not just *observed* and 'researched'. Thus, the learnings from my first voyage constitute the contents of this paper. Due to the performativity aspect of this 'research', I did not take any recording instruments because the 'recording' of the knowledge would be embodied on me. My main teachers[27] for the voyage were Fani Bruun, the *Tapena*[28] of *Gaualofa* and Tiatia Alex Taulelei[29] considered the *Tautai*[30] of the *va'a*; although Tiatia Alex admitted himself that he still has much more to learn, he is, according to the crew, the most knowledgeable Sāmoan at the present time in traditional navigation and star lore.

Connectivity

In June 2015, *Gaualofa* returned to Sāmoa at the conclusion of the *Mua Voyage*[31], an 8-month voyage with *Haunui* (Aotearoa), *Marumaru Atua* (Cook Islands) and *Uto Ni Yalo* (Fiji). The small fleet of traditional voyaging *va'a* sailed to Sydney in October 2014, for the IUCN (International Union for the Conservation of Nature) World

[27] All names and personal conversations mentioned in this paper are used with permission

[28] *Tapena* – generic Pacific word that translates as 'captain' of a sea-vessel.

[29] Alex Taulelei carries the 'Tiatia' chiefly title, and will be addressed as Tiatia Alex. This appellative will be observed throughout this paper.

[30] *Tautai* – (Sāmoan) Master Navigator

[31] https://www.youtube.com/watch?v=bTShZrbsBKM

Parks Congress in November 2014. The small fleet of traditional voyaging *va'a* then sailed to Auckland, and after some repairs, *Gaualofa* sailed on to the Cook Islands on her way back to Sāmoa. Along the way, other crew members joined *Gaualofa*; one of them was Tiatia Alex, who joined from Sydney, Australia.

Upon *Gaualofa's* return to Sāmoa, they were tasked to undertake a short coastal voyage to deliver a grass-roots programme (of environmental and oceanic awareness) and to launch the documentary *Our Blue Canoe* for its international release[32] – the documentary recorded the 2011-2012 *Te Mana o te Moana* voyage, the maiden voyage of the fleet of seven mentioned earlier. *Gaualofa* departed for the *Our Blue Canoe Launch* coastal voyage in late June 2015. It was at this junction that I was invited to join.

Gaualofa was moored at Sheraton Aggie's Beach Resort pier, at the village of Sātuimalufilufi (refer *Image 1.3: Map of Sāmoa*). There were 17 people on board – the *Tapena* and 16 crew. The crew were split into three groups, or Watch; each Watch was on a rotating shift, each shift three hours. When they weren't on deck, the crew were either resting, or in my case, talking and learning from anyone willing to teach. Each Watch had a Watch Captain who, together with two other very experienced crew, made up the 'senior group' that helped Fani make decisions should she need the counsel of experienced voyagers. The crew was a multi-cultural mix: we had three Māori, three Tongans, and the remaining ten were Sāmoan – four from overseas (New Zealand, Australia and USA), and six who were based locally. I was one of four that were crewing for the very first time.

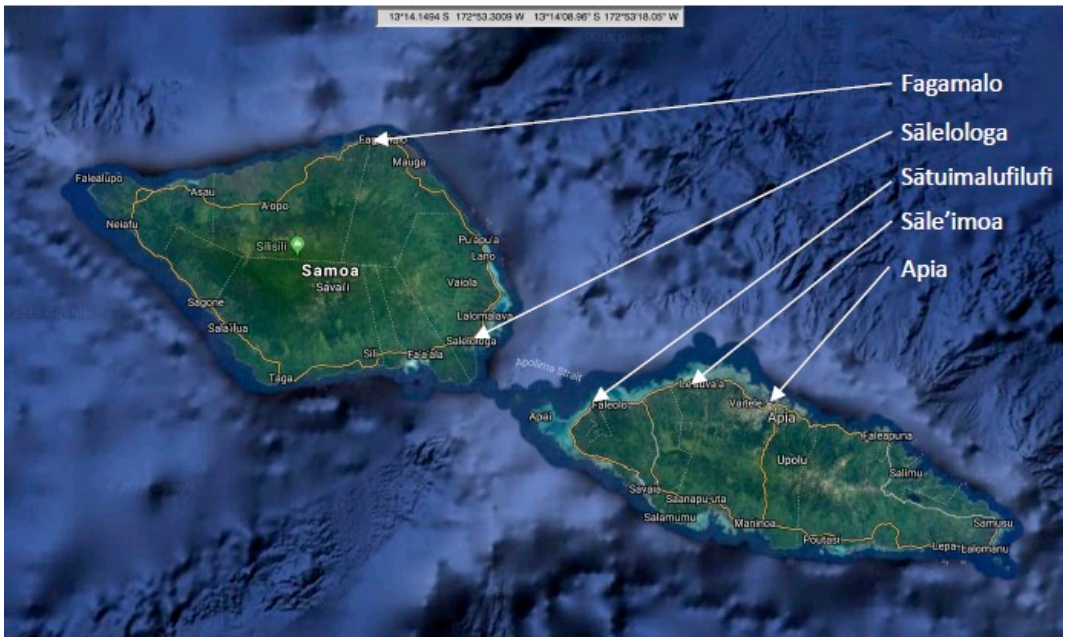

Image 1.3: Map of Sāmoa
Map of Sāmoa with villages mentioned in this paper marked out

Gaualofa – like all seven in the fleet – is a traditionally-designed, twin-hulled voyaging canoe, modelled after a Cook Island-Tuamotu design, and built with modern materials (for example, fibreglass for the hulls, a type of tarpaulin for the sails, modern ropes and lines) and for legal purposes, with modern additions (for example, GPS, VHF radio, engines) and for modern political statements[33], with environmentally friendly, sustainable energy sources (for example, solar panels). *Gaualofa* is 22 metres long, six and a half metres wide and

[32] The documentary *Our Blue Canoe* became an award-winning documentary, and aired in New Zealand in September 2015: https://www.stuff.co.nz/entertainment/film/79420968/Maori-TV-film-Te-Mana-o-te-Moana-The-Pacific-Voyagers-wins-big-at-New-York-awards.

[33] Part of the purpose of the restoration of traditional voyaging/navigation is an analogous restoration of culturally-laden narratives about ocean and marine protection, and sustainable energy sources.

equipped with two masts (a main and a mizzen), and two types of sailing rigs, a traditional rig and a Bermuda rig (refer to *Image 1.4). Gaualofa* can sleep 16 in the hulls, eight 'bunks' in each hull, and has a 'cabin' (or *fale*[34]) on deck that houses the modern navigation equipment.

Image 1.4: *Gaualofa* with sailing rigs
On the left, a picture[35] of *Gaualofa* with the traditional sailing booms and sails, and on the on the right, a picture[36] of *Gaualofa* with Bermuda sailing booms and sails.

After the weekend programme with the village of Sātapuala, Monday is the training day. It was going to be my first time handling the *va'a*. We were going to cross the Apolima Strait to Savai'i on Tuesday to connect with some of the villages, and deliver the programme, so the training day was an opportunity for myself and the other new crew members to learn the basic skills of sailing and navigation. Fani explained that voyaging and navigation is a privileged body of knowledge not given over easily, and those wanting to learn traditional voyaging and navigation must show their commitment through their actions, or *tautua*[37]; the sea drills and *va'a* training are a part of the 'test' to observe a person's character, and whether they *deserve* to learn the body of knowledge. I knew immediately where I stood on this: I was committed to not only learning traditional navigation for the research, but more so, for myself.

On the Monday morning, after breakfast, it was time to head out on the *va'a*. Although it appeared as if we were sailing into the open ocean, we were only a kilometre from land – Sāmoa is placed in the middle of the Pacific Ocean, so once you leave land, you are immediately (and literally) in the middle of the ocean. We were doing our sea trials and drills in front of Faleolo International Airport. It was explained to me that the area where we would be training is considered a lagoon because it is surrounded by a reef. In other words, it is a safe area to practice our drills and do our sea trials. I was immediately comforted – I shuddered at the thought of something going wrong on the open ocean, especially if that 'something wrong' was caused by me.

For the purpose of training, there were set areas on the *va'a* for the new crew to be stationed at, and specific actions to be learnt at each area. The experienced crew were assigned to an area where they would teach the

[34] *Fale* = (Sāmoan) House

[35] Picture courtesy of Sāmoa Voyaging Society.

[36] Picture retrieved from https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=2ahUKEwiDneO0_dXgAhVIfisKHVm7BTMQjRx6BAgBEAU&url=https%3A%2F%2Fwww.insta9pho.com%2Ftag%2Fsamoantraditions&psig=AOvVaw2drb7K4CRsjeetp9sZ5kP2&ust=1551151330252699

[37] *Tautua* – (Sāmoan) Service rendered.

new crew members what to do and how to perform the duties of that area. I started off at the stern (rear) sheet line[38] (the line that goes from the sail to the deck), locking down the mizzen (rear mast) on the port (left) side. My duty was to lock down the sail after it had been moved for particular manoeuvres. After a few sailing drills, we rotated to the next areas, and then the next, and then the next.

I was incredibly excited! It felt surreal for me, indeed a dream come true. What excited me the most was that the actions I was performing *was* the real thing! I was not *reading* about traditional voyaging and navigation, nor watching a documentary about it; I was *actually* doing it in real life. When we tacked[39], I could see that the effort I put into the station had real life implications. I had been reading the literature, and I had watched the documentaries, and now, here I was, on the *va'a* in real life. Moreover, reading about this through the literature, and watching documentaries paled in comparison to *actually* doing it; this is the power of performativity: connectivity; there was a very real connection to knowledge through performative enactments. The knowledge I was learning was not only about sailing, but because of the design of the *va'a*, I was also learning about historical, cultural and spiritual elements to sailing. By this, I mean that modern sailing relies on machine-driven winches and grinders to hoist, move and tighten sails; traditional *va'a* rely on manual labour and human strength. Essentially, the difference is that when we handle the lines, we can feel the pull and strength of the wind and ocean currents through the line; with modern yachts, that 'feeling' of connection with the wind and the current is reduced because the leverage gained from the machinery lessens the human effort, and therefore, limits the level of connection. This was one way we were able to 'feel' the wind and the current, and grew in knowledge about the wind and current and their different effects on the *va'a*. Historically and culturally, this aspect of the wind gave birth to the star/wind compass/map which I will describe in more detail in the next section of this paper.

After a couple of hours of drills, my final station was the *foe*[40]. As soon as I stood at the *foe*, Taleni, one of the senior crew, instructed me to grab the *foe* and stand strong – the *foe* is heavy. As I did, I had what I would describe as 'a spiritual moment', or an out-of-body experience. As I stood at the *foe*, I saw a large fleet of traditional voyaging *va'a* filled with ancient voyagers and mariners; the flotilla came up alongside *Gaualofa* and they looked at me, and nodded in approval. The surrounding sea was filled with the ancient voyagers. I had goosebumps all over my body, the hair on my arms stood up straight, and my eyes welled up in tears. Everything around me was drowned out and all I could see were the ancient mariners and voyagers smiling at me with approval. In that instant, I felt a hand reach out to me and rested on my shoulder. The hand on my shoulder felt benevolent and kind; the sensation, or thought, that ran through my body felt like a plea from the ancient mariners to me, to keep them alive, and not to forget this heritage. As I took in the moment, I felt 'buzzy' and 'all lit up'. It was a moment that captivated me, and I felt instantly connected to the *va'a*, to the ancient voyagers, and also to the history of traditional voyaging and navigation.

In my mind, it seemed as if a lot of time had passed, but as I came out of the 'moment', I realised that it had only been the blink of an eye in terms of time; as I came out of that 'moment', I saw Fani throw a floatation device (a 'floaty') overboard and shout out: "Man overboard!"

I panicked. I let go of the *foe* and asked: "what did I do?" I thought I had done something to cause the *Tapena* to throw the floaty overboard. The whole crew erupted into laughter. Amid the laughter, Taleni instructed me that the *foe* must never to be dropped. I replied that I did not know what to do. Taleni then assured me that he will tell me what to do, I just had to listen. With that assurance, I picked up the *foe*, and we began our 'man overboard' drill. Taleni showed me how to steer the *va'a;* we looped around to pick up the floaty, and with all eyes on me to make sure we sailed up alongside the floaty for the pick-up, I missteered the *va'a*, and we missed the pick-up. I turned to look back at the floaty in despair, thinking: what if that had been a real crew member overboard? I did not have time to think on it as Fani instructed that we must loop around again to pick up our 'man overboard'.

We looped around again, and indeed, I missed again. I became frustrated at my incompetence. In resignation, I turned to Taleni: "Here, you come and do it".

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[38] A 'line' is a type of rope used on sea vessels; a 'sheet line' is the line that is used to control and move the boom and sail.

[39] 'Tack' is a sailing manoeuvre of 'zigzagging' angular to the direction of the wind, in an effort to sail a course into the wind.

[40] *Foe* – (Sāmoan) Steering paddle at the stern (rear) of the *va'a*; helm.

Fani instructed me to stay on the *foe* and explained that this is what training runs were for. With that, she directed me to loop around again. I felt incredibly inadequate and embarrassed because my errors were so visible and consequential; two passes of the floaty and we still had not picked it up. The third pass, however, worked; with Taleni's help, I managed to steer straight, and steer well. I was incredibly relieved, and ready to pass the *foe* on to someone else; I did not like the responsibility that came with such an important role.

To make matters worse, Fani announced that that 'rescue' took 23 minutes. I asked her how long *should* it have taken, and was met with the reply: less than 3 minutes. I could not hide the embarrassment and the despondence I was feeling. The despondence, however, was interrupted with another shriek from Fani: "Man overboard!" Unfortunately for me, Fani had thrown the floaty overboard again. Without hesitation, the crew launched back into our 'man overboard' drill and *I was still at the helm*.

We looped around, and yes, I missteered the *va'a* yet again – I steered too wide. Incredibly frustrated at my lack of skill, I asked Taleni to take over. Both Taleni and Fani looked at me sternly and stated firmly that I was to stay on the *foe* and to steer the *va'a* around. I obeyed. We looped around again, and this time, we managed a good clean pick up. I was relieved that this time, it only took *two* passes to pick up the floaty – at least it's progress.

With that relief, Fani announced: "16 minutes." I apologised to everyone for my lack of skill. They were all very encouraging and insisted that I not worry about 'messing up' because this is what these drills were for. Taleni then began to teach me some of the dynamics and physics of steering; after failing the first two attempts of the man overboard drill, the physics of steering started to make better sense to me.

Then, yet again, another shout from the *Tapena*: "Man overboard!" We were at it yet again, another 'man overboard' drill. This time, I was focused on what I needed to do; now that I understood the physics at work, I realised that the little knowledge I had acquired during these drills was enough to do the task at hand. This time, I focused on a wider loop to give me more time and space to straighten the *va'a* and align the floaty properly. Sure enough, with that focus, and greater sense of urgency and purpose, we picked up the floaty on the first run. What a relief. Everyone congratulated me on a job well done, and commented on the noticeable shift in my mindset and the translation of that shift into sharp, purposeful action.

Affirming the crew's comments, Fani shouted out: "Six minutes!"

Everyone cheered and congratulated me once again. Surprisingly, the phrase that is used to congratulate me was: *mālō le foeuli*. It translates as: well done steerer – *foeuli* is the Sāmoan word for the 'steerer', the one that handles the *foe*. I was surprised by this phrase because it sounded very similar to a common Sāmoan phrase, *mālō le fa'auli*, which is often said from the passengers of a vehicle to the driver. When I stated the observation to Fani, she explained that *mālō le fa'auli* is a mispronounciation of *mālō le foeuli*. She added that because Sāmoans have lost their traditional navigation knowledge, they no longer remembered what the original phrase was. It then made sense to me because the *foeuli* is the helmsperson. Interestingly, when we returned to land after the voyage, I began to use the phrase *mālō le foeuli* when I used the taxi services and the older Sāmoan drivers looked at me in surprise and acknowledged that that was indeed the proper word, which they had not heard in a very long time; they confirmed the concept of the *foeuli* and the phrase of old.

After the third 'man overboard' drill, Fani considered the training a success, and brought the training and drills to an end. I handed the *foe* back to Taleni so that I could sit down and take a moment to take in all that had just happened. As I reflected on the training, especially the transcendent moment I had before taking up the *foe*, and then being on the *foe*, I sat in silent awe of the experience; I was filled with joy.

I felt in my heart, in my spirit, a very close connection to the ancient mariners; it is a moment that has transformed the way I think of traditional navigation, no longer a matter confined to literature, nor to the past, but a living, breathing knowledge that is alive in me, through me and around me. The transcendent moment made me feel connected to the spiritual as well as physical and historical aspects of voyaging and navigating. It became etched in my heart that I must be a part of the restoration project, of restoring traditional navigation knowledge, and making it relevant to today. Moreover, being on the *foe* when that moment struck had the effect of the *foe* now representing the art of navigation, the history of voyaging and discovery, and the connections to the elemental aspects of voyaging and navigating, the wind and the waves. And with that

feeling of connection set in my heart, in my spirit, I no longer felt trepidation towards the *va'a* nor the open ocean. In fact, I felt like I was a part of the ocean, and the *va'a*.

Much later, in a personal conversation with the then-Head of State, Tui Atua, he confirmed the connection:

> A *va'a* is made from a tree. And in order to begin to construct, you have to cut down a tree. And in order to cut that tree, you have to go through this ritual. And this is where you say "*o le sā o Manuvao, le taulaga lea* is [this sacred ritual is Manuvao's, this offering is] due to Manuvao". Manuvao is the god of the forest. And so you do this ritual and you ask for a pardon of the god Manuvao for cutting this tree because you're going to hurt this tree, and the tree has a life, a soul. So when it is brought in to construct the boat, it still possesses that life and that soul . . . this is what gives substance and essence to your navigation culture; to know what you as a navigator, the *Tautai*, you have to know the tides, you have to know the stars, etcetera etcetera, but you have to respect that boat because it has a life and a soul. And so when you go out to sea, you should be able to assess the winds, the currents, and that's where you have the saying "*ua fa'apopo ni aso, a ua lē tu'ua asofolau*", meaning that you are looking for the good weather before you sail out. The boat is part of you. It has a life of its own and you have to respect it, you have to ensure you negotiate the elements before you put out to sea.

Later in our conversation, Tui Atua added:

> You carry the DNA of your forbears thousands and thousands of years ago and you are not an individual; you are a member of a family that includes the dead and the living . . . and forever, whether you like it or not, you are connected to the boat, the boat that brought you here; you are connected to the tree from which your boat is from, you are connected through your *pute* [belly button] to several generations before.

Navigation basics

After our drills, we spent a couple of hours frolicking in the lagoon. As late afternoon approached, we headed back to the pier; one Watch readied dinner while the others played volleyball. I decided to stay on the *va'a* and continue to take in the moment; I was still in silent wonderment of the experience I had just enjoyed. While on board, I asked Fani if she could teach me how to tie the necessary knots for the sails, and for the dock lines. I explained to her that I would like to learn so that should I be called upon to tie knots, I would like to show more competence than I did earlier on the *foe*. At that request, Fani and Tiatia Alex remained on board to show me how to tie the most important knots for sailing; it also became an invitation to the other new crew to join in. After an hour of tying knots, the other three new crew went to join in on the volleyball, but I decided to stay behind and continued to practice tying knots – I wanted to commit it to muscle memory. In appreciation of my commitment, Fani and Tiatia Alex stayed with me. I decided to use the opportunity to continue my learning in other areas of traditional navigation.

My first question for them was regarding the fabled 'star compass'. I had read the literature, but I wanted to know its utility and operation. On that, Tiatia Alex stated that it was imperative that my phrasing and understanding was accurate; he began to correct some of my thinking. He explained that the notion of 'compass' is a Western construction, premised on Western notion of latitude and longitude, based on Western principles of navigation, or orientation, which did not fit the indigenous model of navigation. Tiatia Alex added that the 'Polynesian star compass' was more of a 'map' (that mapped out 'pathways') rather than a 'compass'. Fani qualified that explanation: it was more of a star-*path*, or star-*chart* – the concept of a 'map' refers to the topography of land, whereas a 'chart' refers to the characteristics of nautical and aeronautical space. Moreover, the direction and orientation of the 'starpath' were for both stars *and* winds, and is thus rendered the 'star/wind-path'. For the sake of brevity, I will refer to it as the starpath. Furthermore, what is now rendered the 'Polynesian' starpath, was in fact adopted from the Hawai'ian starpath, developed by Nainoa Thompson – gleaning from Piailug's 'Micronesian' starpath, Thompson developed the Hawai'ian starpath. From that rendering, the other Pacific nations localised Thompson's design, and it is from these origins that the Sāmoan starpath that is used today, comes from (refer *Image 1.5: Starpath*).

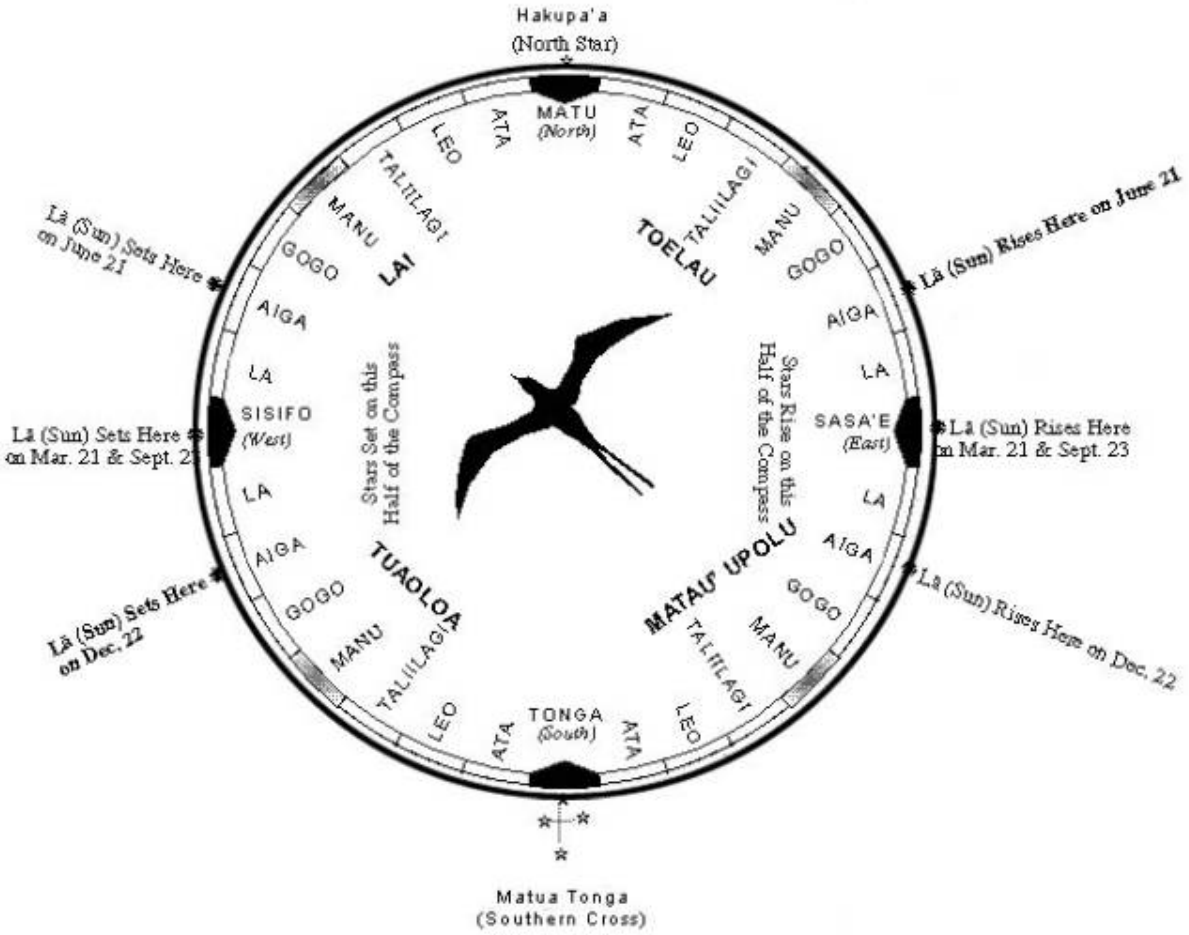

Image 1.5: The Sāmoan Starpath[41]
The four 'quadrants', *To'elau*, *Matau'upolu*, *Tuaoloa*, and *La'i*, and the seven 'houses' as noted in *To'elau*, reading clockwise, are '*Ata*, *Leo*, *Tali'ilagi*, *Manu*, *Gogo*, '*Aiga*, and *Lā*, which are mirror-imaged in the 'quadrant' of *Matau'upolu*, and mirror-imaged again in *Tuaoloa*, and again in *La'i*.

The starpath depicts the 360-degree horizon into four 'quadrants', or 'directions': *To'elau*, *Matau'upolu*, *Tua'oloa* and *La'i*. Each 'quadrant' refers to a 'direction', for example, the 'quadrant' that is marked by the north and east boundary in Western navigation, is the *To'elau* direction; the 'quadrant' marked by the east and south boundary is the *Matau'upolu* direction. Each quadrant, or direction, is divided into seven sections, or 'houses'; the stars rising from specific parts of the horizon is metaphorically alluded to a person that leaves their house to perform their duties[42]. Moving clockwise, starting in the direction of *To'elau*, the 'houses' are *'Ata*, *Leo*, *Tali'ilagi*, *'Aiga*, *Gogo*, *Manu*, and *Lā*. These seven 'houses' in *To'elau*, are mirror-imaged in *Matau'upolu*, which are mirror-imaged again in *Tua'oloa*, and again, in *La'i*. Thus, when, for example, Vega rises in the north-western sky, it would be described as Vega rising from the 'house' of *Manu*, in (the direction of) *To'elau*. Direction and orientation are in terms of these points of reference, of 'houses' and 'directions'.

Tiatia Alex added that Navigators found ways to measure everything, and for ease of use, they used the *va'a* and their bodies. He explained that a hand-width above the horizon, for him, equated to an hour. He then got me to place my hand on the horizon – fingers parallel to the horizon, pinky finger directly on the horizon – and showed me that the point in the sky at which my pointing finger reached, equated to an hour. In other words, if

[41] Picture courtesy of Sāmoa Voyaging Society

[42] In this paper, I shall refer to these sections of the horizon as 'houses' instead of fale (which is the usual reference) to avoid confusion with the 'cabin' on the deck of the *va'a* which is also called a *fale* – on the *va'a*, there is no mistaking which is which, but on paper, in the absence of the proper context, that distinction may not be so obvious.

a star rose from the horizon, the point at which it reached the tip of my pointing finger meant that an hour had passed; two hand-widths meant that two hours had passed. Tiatia Alex added that after three hours, the hand-width was no longer useful, until three hours before sunset, where the hand-width could be used again to determine time remaining to sunset. And now I have on my body the measure of an hour. Another example of the body being used, Tiatia Alex explained, was to determine the direction of the wind. He said to start by facing a direction so that the wind was felt on one cheek, and heard blowing past the ear of that same cheek. Then, slowly turn your face towards the wind until both ears could hear the wind passing by; you are now facing the direction that the wind was coming from. It was becoming clear to me that traditional navigation was indeed very complex, very deep and very common sensical; it did not need any technical instruments because everything for navigation was already there, on the *va'a* and on the Navigator.

Referring back to the concept of 'map', Tiatia Alex explained that this rendering is important; a 'compass' referred to manufactured concepts of longitude and latitude, whereas a 'map' referred to pathways in the night sky already *mapped out* for the observant Navigator. Basically, all celestial bodies move east to west; the sun, the moon, and the stars all rise in the east, and set in the west. The 'house' at which they rise in the east, they set in the same 'house' in the west. For example, Vega rises in the 'house' of *Manu* in *To'elau*, and would therefore set in the 'house' of *Manu* in *La'i*; Arcturus will rise in the 'house' of *'Aiga* in *To'elau*, and set in the 'house of *'Aiga* in *La'i*. This effectively meant that the stars mapped out latitudinal settings. Furthermore, Tiatia Alex said, the 'pathway' of Arcturus is in fact the latitude – or 'pathway' – for Hawai'i. If a Navigator were going to Hawai'i from Sāmoa, they would sail north using certain stars for a northerly heading, and when Arcturus is directly above the *va'a* – that is, on its mast – it was simply a turn to starboard (the right) and to stay that course until landfall on one of the islands of Hawai'i. Thus, the stars not only provided a latitudinal 'pathway' for navigation, but also a 'pathway' to the actual islands themselves. Hence, the rendering of 'starpath'. Moreover, every island had its own 'zenith star', a star that indicated its location (or latitude).

Tiatia Alex continued to explain that the Master Navigator would know over 200 star names and star paths; a skilled Navigator could still navigate with only 30-50 star names and star paths, like he is able to, but limited in the courses they could follow. Furthermore, there is a seasonality to the stars that the Navigator must always be aware of: each day, the celestial bodies appear four minutes earlier than the previous day. Over the course of 28-30 days (or a lunar month), the stars, in effect, rise and set two hours earlier than the previous lunar month. For example, at this time of the year (late June), the Southern Cross lays horizontal (refer to *Image 1.6: Southern Cross 'lying down'*) at midnight; in late July, a lunar month later, the Southern Cross would lay horizontal at 10pm; in late August, the Southern Cross would lay horizontal at 8pm.

Image 1.6: Southern Cross 'lying down'
From the southern sky (marked 'S' on the image), The Pointers, Alpha Centauri and Beta Centauri, point to the 'top' of the Southern Cross (Gamma Crucis), and when aligned with the 'bottom' of the Southern Cross (Alpha Crucis), marks the horizontal line, forming the image of the Southern Cross 'lying down'.

Furthermore, from the Sāmoan night sky, when the Southern Cross lies down horizontal, it lies down just above the horizon. In fact, two fingers above the horizon; recalling that a handspan above the horizon is equivalent to an hour, the Southern Cross lying flat at two finger-widths above the horizon, in effect, means that approximately half an hour will have elapsed between lying flat and its disappearance below the horizon. These were important time indicators for the ancient mariners who did not have a 'clock' – although they did not have a concept of 'an hour', knowing how many handspans of time remained, and the anticipation of the sunrise and sunset were key indicators of time and distance travelled, and therefore, time and distance remaining to the destination. Thus, Tiatia Alex said, additional to the stars indicating latitude and locating islands, the stars also indicated time.

The difficulty for the Navigator, however, was keeping all of this in mind while moving on the ocean; everything is always moving, nothing stays still. Essentially, as the *va'a* sailed north, the stars and their movements would look markedly different as the more northern stars would start to appear in the night sky – like Polaris – and the more southern stars would begin to disappear below the horizon – like The Southern Cross. Therefore, the Navigator would need to re-evaluate the stars and their positions, constantly. The Master Navigator, knowing the star paths and the time of the year, could expect specific stars to rise and set at certain parts of the night sky at certain times of the night. Additionally, the patterns and seasonality of star movements indicated that from certain parts of the ocean, observing a setting star should happen contiguously with the movements of other stars – that is, star *pairs* (two stars rising or setting at the same time in different parts of the night sky) or star *sets* (three or more stars rising or setting together from different parts of the night sky). If such an observation was taking place, it would mean that the *va'a* is in a specific part of the ocean. To observe such a phenomenon out of that order would mean that the *va'a* had drifted off course. In other words, watching one of the stars in a 'star pair' rise earlier than the other, would mean that the *va'a* had moved slightly in the direction of the earlier rising star. In this way, a Master Navigator would always know their positioning on the ocean. This is the ancient version of position triangulation, or as it is more commonly referred to today, global positioning system (GPS). In essence, today, modern navigation uses the aid of technology and satellites to triangulate position, but the capability to triangulate position anywhere on the ocean was already possible through a keen observation and memorisation of the movements, pathways and seasonality of the stars.

While discussing aspects of traditional navigation, Tiatia Alex and Fani explained that one of the most important aspects for navigation is *perspective*: learn to think like a Navigator; Navigators see the world differently, and if I did not 'get inside the mind of a Navigator', I would struggle to learn the concepts. They explained that in the ancient oceanic ways, when a Navigator made it to land – for example, Savai'i – they would say: *we fished up Savai'i*. Fani explained that one of the ways of the Master Navigator was a significant shift in thinking. One way of thinking of navigation was the common perspective of superimposing the starmap onto the horizon, and then the *va'a* moving through the water to a destination. An alternative perspective, that of the Master Navigator, was that the *va'a* stood still in the ocean, and if navigated competently, the land would come to the *va'a*[43]. Thus, when land was sighted on the horizon, the *va'a* did not head towards land, but the land came to the *va'a*. In effect, this had the appearance of the land rising out of the sea, and coming towards the *va'a* as if it were 'fished out', in the same way a hooked fish rises out of the sea as it is pulled in towards the *va'a*. Thus, the saying: *we fished up Savai'i.*

At that startling revelation, Tiatia Alex added that the story of Maui 'fishing up' Aotearoa, as well as other islands of the Pacific, made better sense from the perspective of the ocean; Maui was not a fisherman*, he was a Master Navigator*. It then dawned on me: it is no wonder that there is so much misinformation and misrecognition about indigenous myths and legends; they make sense from the perspective of the ocean and failure to 'learn' this 'language', or perspective, results in the mythologising of this knowledge. In other words, there was a way of communicating, a language that must be disentangled, for the body of knowledge of navigation to make sense, and this is best accomplished from the perspective of the ocean, or from a navigating perspective.

Tiatia Alex and Fani also explained the utility of birds in traditional navigation. Upon sighting traditional voyaging canoes, Western explorers called the traditional sail a 'crab-claw' sail. However, the crab's claw has nothing to do with traditional sails; the traditional sails were modelled after a bird's tail, and the shape the tail takes when the bird changes direction. This can be seen when observing the *gogosina* (various varieties of tern) in flight. Additionally, in traditional navigation, birds fall into two categories: those that fly out to sea in the

[43] In the next section, Navigating by the stars, this is explained a little more, and *Image 1.8: Marked on the va'a*, shows how this is projected in the mind of the Navigator.

morning and return in the evening with food for their family; and those that fly out to sea and stay at sea their whole lives, only to return for mating, before flying out to sea again. The able Navigator would know which birds to follow to find land: in the evening, the land-bound birds will soar high to find land, and then head in that direction, thus, setting the direction for the *va'a* to follow.

Furthermore, the experienced Navigator would know through the patterns and pathways of the stars, the arrival of seasons, and therefore, the seasonal migration patterns of marine life – for example, whales, dolphins and sharks. Thus, by the presence of certain marine creatures, Navigators could confirm which part of the ocean they were in – they had the marine life and birds by day, and the stars by night.

Moreover, Tiatia Alex explained, much of the current literature describes some of the more observable techniques – like the starpath, wave piloting and tacking and shunting techniques, among other navigational techniques – but there was still a significant portion of the body of knowledge associated with traditional navigation that was not conveyed in the literature. Much of it is portrayed in oral traditions, like proverbial expressions and stories from the elders; some of it is conveyed in modern 'legend and folklore' stories, and some are gathered from other traditions, like that of the *Tufuga*. Tui Atua explained:

> The *Tufuga* of old are a type of 'priest'; they are not just the master craftsman and the key knowledge-keepers, but they also know the right prayers and chants to invoke, much like a modern-day priest would. The *Tautai* is also a *Tufuga*.

It was becoming more and more evident that traditional navigation is incredibly complex, grounded in the connections to the elements, to the cosmos, and to the spiritual elements. Western navigation, traditionally, was two-dimensional: longitude and latitude. Traditional navigation used the moon, the sun, the stars; in many respects, a three-dimensional navigation system. Now, with satellites, Western navigation is three-dimensional. Notwithstanding this, traditonal navigation also relied on the guidance of marine life beneath the sea, and bird life above the sea: a fourth dimension. Added to that, the concept of the *vā*: spatial awareness, and spatial inhabitation; the way we respect and honour 'spaces' between people, between people and nature. In fact, all Pacific nations have welcoming ceremonies as a way of inviting people into 'spaces', and allowing them to inhabit 'spaces'. The *vā*, the space between me and you, is not only physical, but it is also spiritual, cultural, philosophical, ideological, intellectual, emotional. Moreover, when you are out on the open ocean, the concept of *vā* takes on a whole new dimension. When you can show respect for the wind, the waves, and the way those elements inhabit spaces, you can also see how you can inhabit a space created for you by the wind, the waves, the stars. In other words, a fifth dimension. Added to that, our reliance on God and the spiritual realm for guidance and direction, and the way they are able to inhabit, or influence, the spaces of the physical realm. Pacific-based traditional navigation is *multi*-dimensional.

Navigating by the stars

After the training at Sātuimalufilufi, we sailed across Apolima Strait to the village of Sālelologa, which is where the main wharf on the island of Savai'i is situated (refer *Image 1.3*). For the sail, I primarily observed and asked questions, while also continuing to practice tying knots and locking down the sheet lines on the deck. We arrived safely at Sālelologa, and over the following two days, we delivered our grass-roots programme. At the conclusion of those two days, there was a further day's delay due to inclement weather, and then it was time to depart for the next port, Fagamalo Bay, which is halfway up the north coast of Savai'i (refer *Image 1.3*). The sail to Fagamalo Bay was filled with story-telling and knowledge exchange. The sail was also significant for an encounter we had with a small pod of sperm whales, just 20 metres from the *va'a*, two kilometres out from the lava fields of Sāle'aula, half an hour from Fagamalo Bay. Fani explained that the significance of this sighting was that whales had not been seen in Sāmoa – *that* close to the island – in many years, even decades. It was my first time encountering whales, and indeed, etched in my heart as one of the highlights of this voyage. After two days in the village of Fagamalo and delivering our programme, it was time to head back to 'Āpia.

For the sail back to 'Āpia, we were faced with a dilemma. From Fagamalo to 'Āpia, it was an eastward sail, approximately 80 kilometres in distance, less than a day's sail if it was to be sailed in a straight line. However, the winds were coming from that eastward direction, as they are inclined to do at this time of the year. Thus, we had two options. Option one, was to sail directly towards 'Āpia, which would entail tacking many, many

times – an arduous task. The alternative was to sail in a north-easterly direction for approximately 100 kilometres, then tack and head directly toward ‘Āpia on an angle (refer *Image 1.7: Return sail to ‘Āpia*), altogether, a sailing distance of approximately 170 kilometres. If the conditions were right, this could be done in well under 24 hours. After Fani discussed this with the senior crew, it was decided that we would take the second option.

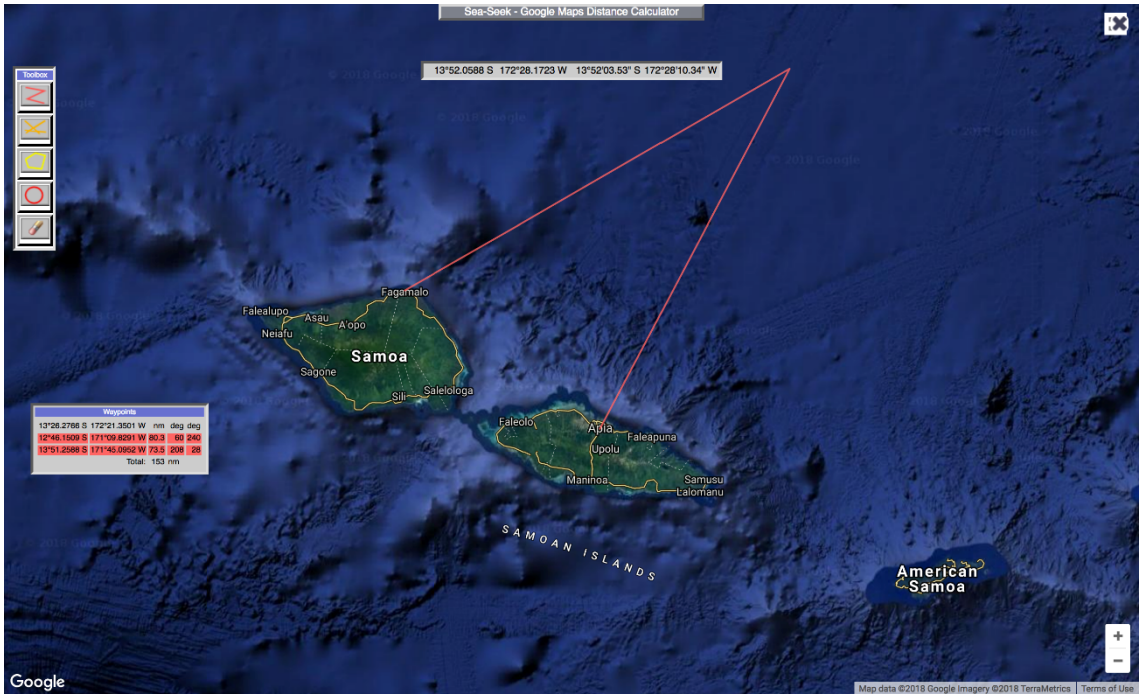

Image 1.7: Return sail to ‘Āpia
The red line shows the approximate course from Fagamalo Bay to ‘Āpia. Heading north east from Fagamalo Bay, we travelled approximately 100km to the turning point in the open ocean, and tacked back to ‘Āpia, approximately 70km in distance.

We set sail at about 5pm. As we departed Fagamalo Bay, the sun was starting to set. I asked Tiatia Alex about the stars we were going to see, and how the night sky was going to be used to navigate. He explained that sunset is the best time to take note of key directional points, and to mark the placement of these points on the *va’a*. He also explained that in the Pacific Ocean, the currents and winds were predictable and reliable. Essentially, this meant that the conditions were unlikely to change, which also meant that the direction of the current and winds were likely to be constant throughout the voyage. This, then, made plotting our course relatively easy.

Once the setting sun marked west, Fani instructed the *foeuli* to head in the *To’elau* direction, towards the ‘house’ of *Tali’ilagi* (refer *Image 1.5*). The *foeuli* aligned our heading, and marked it for Fani to confirm. The senior crew agreed that the heading was correct. Tiatia Alex pointed out to me that on this current course, west marked on the *va’a* was just behind the navigator’s seat on the port side (refer to *Image 1.8: Marked on the va’a*); east was marked on the starboard side of the *va’a,* midship – this is from the point of view of the *foeuli*. Tiatia Alex also noted that the winds were coming from *Matau’upolu*, from the ‘house’ of *‘Aiga,* and the currents were coming from *Sasa’e*. On the *va’a*, this meant that the current was coming to the *foeuli* from the fourth *‘iato*, and the wind was coming to the *foeuli* from the sixth *‘iato* (refer to *Image 1.8: Marked on the* va’a).

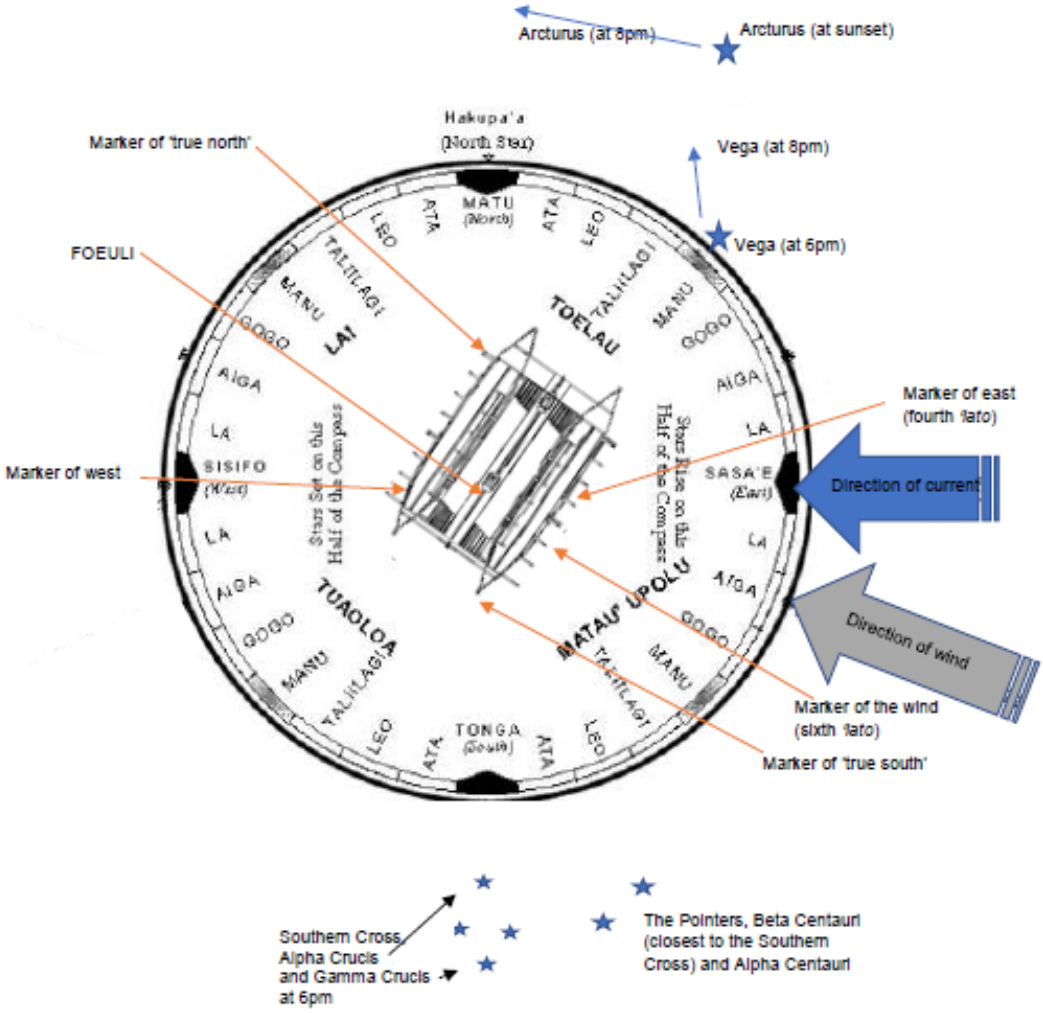

Image 1.8: Marked on the *va'a*.
This image shows how the Navigator marks the *va'a*. From the position of the *foeuli*, transpose the horizon with the starpath, and place the *va'a* in the middle of the starpath. With this projection in mind, the Navigator marks the directions on the va'a, with specific markers for wind direction, direction of the current, sunset and sunrise added. From this perspective of the Navigator, the *va'a* is now in the middle of the ocean, and as they voyage, their destination comes to them.

Tiatia Alex and Fani explained that the importance of these markers on the *va'a* was that if the stars became invisible throughout the night – through cloud cover – we would still have direction and heading; if the *foeuli* changed course, for any number of reasons, we would know because the current and winds would then come to the *foeuli* from different points of the *va'a*. Moreover, we would be able to judge how far we may have strayed from the current course depending on where the winds and current would be coming to the *va'a*. For example, if throughout the night the currents started to come to the *va'a* from the 'house' of *Manu*, and the winds were coming from *Sasa'e*, it then meant that we were heading towards the 'house' of *Ata* in *To'elau* – keeping in mind the winds and currents are constant. In effect, it would mean that we were heading too far north, in fact, two 'houses' north of our course. To remediate this, we would be required to adjust our heading by setting a course to head two 'houses' easterly to align our course, and throughout the voyage, continue to make that easterly adjustment until fully aligned to the original course. The correct alignment would be

determined by the winds and waves, and the proper alignment would be determined once the stars became visible, or at sunrise (which could be estimated using sunset of the previous night if there was still cloud cover).

For the matter of time, and how long to sail in a certain direction, the position of specific stars throughout the night could be used to determine an approximate time. In this case, the Southern Cross laying horizontal approximated to midnight, and would be a significant marker of time for us.

For our course, then, Tiatia Alex pointed out that when the sun set, Arcturus, one of the brightest stars in the night sky, should appear in the north eastern sky, and should be directly 'on the nose' of the *va'a*. At the same time, Venus and Jupiter (who would be 'side by side') in the western sky – about two handspans above the horizon – should follow the sun's exact path into the western horizon (and on the *va'a*, should set just behind the navigator's seat). As the night progressed, Arcturus would continue its path west, passing through north, and therefore, would become unusable for where we were heading. Thus, we needed to accommodate moving stars, and should know how long to let Arcturus be on the nose of the *va'a* before slightly adjusting the heading of the *va'a* so that Arcturus started to fall on to the port hull.

Indeed, as the sun set and it got darker, Arcturus appeared on the nose of the *va'a* – confirming our course – and Venus and Jupiter also appeared in their expected positions, following the same pathway as the sun into the western horizon.

Tiatia Alex continued to explain that the next significant milestone in the night sky would be when the Southern Cross 'stands tall' – that is, when the top of the Southern Cross (Gamma Crucis) and the bottom of the Southern Cross (Alpha Crucis) are perpendicular to the horizon. When the Southern Cross is standing tall, it marked 'true south'; on the *va'a*, that would be marked on the tip of the starboard hull (refer *Image 1.8*). Moreover, the Southern Cross standing tall not only marked true south, but it should also happen at about the same time as Vega rising in the north eastern sky, from the direction of *To'elau*, in the 'house' of *Manu*. This should happen about an hour after sunset, which should be approximately 6pm. Furthermore, the rising of Vega would then mark it as the principal guiding star. However, Vega rising does not immediately make it our principal guiding star – keeping in mind that Vega rises in the 'house' of *Manu*. About two hours (or, two handspans) after its ascent, Vega would be in the house of *Tali'ilagi*, which was our heading, and at which point, it would then become the star that we set our course to. The point at which Vega would become our guiding star, would be confirmed by the setting of Venus – keeping in mind Venus was 'about two handspans' above the setting sun. Effectively, the setting of Venus, and Vega becoming the principal guiding star – about 2 hours after sunset – meant that the time was approximately 8pm; a change of Watch. And then, as if cued to do so, Fani noted the time and instructed the change of Watch.

In an eerie synchronisation, I could see thick clouds moving in quickly from the east horizon, and there was a noticeable increase in wind strength and the intensity of the waves. I asked Fani and Tiatia Alex if a storm was brewing, and whether it was heading in our direction, and how we would manage it.

Tiatia Alex and Fani both stated that the clouds indicated stronger weather intensity, but assured me that they were not storm clouds. They explained that the 'fluffy' appearance of the clouds[44] was a give-away of the type of weather that was heading our way: stronger winds, which meant rougher seas. They added that if this type of cloud formation was above land, then it was an omen of a pending storm. However, in the middle of the ocean coming from the east, it was simply a sign of wild weather. They both smiled wryly at that thought, and explained that stronger winds and rougher seas meant that the skill of the voyagers and navigators was about to be tested. Expanding on that thought, Tiatia Alex and Fani added that navigating adverse conditions not only tested your skill level, but it was also transformational; the better you connected to the winds and waves, the better you would be able to navigate, and the passing of the 'test' was that *you now belonged* to the wind, to the waves, to the ocean, to the stars, to the ancestors, and to God. At that explanation, even more so now, I waited with excitement as the conditions rose in intensity in accordance with the thick, fluffy, fast-arriving clouds. Having been on the *va'a* for a week, I was about to be tested; I was actually more excited about the transformation about to take palce, than I was anxious about the worsening conditions.

By 9pm, the stars were hidden under full cloud cover; for the sake of safety, Fani made the compass and the clock in the *fale* available to the crew for navigating the rest of the voyage. Thus, from that point, my learning

[44] Stratocumulus clouds

to steer by the stars had to take a pause, but learning to navigate rough seas in the open ocean was the new skill I was about to learn.

Later, as I reflected back on this learning to navigate by the stars, it was incredibly fulfilling on so many levels. There is much to be said about how much more connected I felt to the stars, the winds and the ocean currents. There was a sensation of having experienced something 'magical', of feeling extremely close to nature, close to God. I felt vulnerable and safe, scared and strong, small and big. It was a feeling of connectedness, that I was indeed vulnerable, but in the safety of the sea, I was secure; the intensity of the ocean and the skies made me aware of my frailties, and that scared me. But I also felt that because I was connected to the ocean and the skies, I was strong because I felt I was a part of that intensity; the immensity of the ocean and the skies made me feel small and insignificant, but being able to navigate it gave me the sensation of being able to master such immensity. It was an incredible array of emotions. Moreover, remembering the words of the *Tufuga* noted at the beginning of this paper, this experience gave me a whole new appreciation of the *tatau*.

Navigating the ocean

The clock read 11pm, and it was time for a change of Watch, which meant that my Watch was now on; I was the only one of my Watch that didn't sleep so the rest of them all came on deck, well rested – I was still too excited to sleep. Our Watch Captain got the update from the previous Watch Captain, and then briefed us of our course, heading and duties. The extra speed we had been getting from the weather shift meant that we were going to tack at about 1am, and with the tack, it would be up to our Watch to steer the *va'a* as straight as possible towards 'Āpia – it was critical that the angle we head back to 'Āpia was exact because the Watch that would follow us would also follow our line of direction. Given that we no longer had use of the stars, like the previous Watch, we reverted to the compass for our course bearings to 'Āpia – under traditional navigation techniques, where there was usually no time pressure, we would have waited out the heavy conditions until we could see the stars, or sunrise, to then determine our course and bearing.

Once our briefing was over, we took over on deck from the previous Watch. We were going to take half-hour shifts as the *foeuli* throughout the Watch. The first shift on the *foe* was a 21-year old Tongan, Ofa.

During the previous Watch, one of my many conversations with Tiatia Alex was to do with the *foe* – techniques and strategies for steering through tempestuous conditions and getting optimum speed. He also explained to me that one of his roles, unknown to the crew, was to keep an eye on our progress using the GPS in the *fale*; this was to be done as a back-up system, and without the crew's knowledge – it allowed the crew to navigate as much as possible using traditional methods, while also having a back-up system should anything go awry. It was also a teaching tool for Tiatia Alex: using the GPS, he would be able to see our progress, and also gauge everyone's steering abilities by observing how straight they steered the course on their shift. Using that knowledge, Tiatia Alex explained to me that the two best steerers – the ones who could keep the heading of the *va'a* the straightest – was in fact Ofa, and one of the other Tongan crew members in another Watch, Mika. At Tiatia Alex's behest, I was to observe and learn from them two at every available opportunity.

Hence, when Ofa went to stand at the *foe*, I immediately asked him if I could stand beside him, and if he could explain to me what he was looking for, why, and how that affected his course of action. This would expedite my learning, and give me greater insights. Fortunately for me, Ofa was a willing teacher.

When Ofa took the *foe*, he immediately started to look around at the conditions. I asked him what he was looking for. He said that he was looking at the wind, taking note of its direction. He was also looking at the sails, making sure that what he read of the wind by sight and feel, he could also confirm by its impact on the sails. Fani added that the sails were set at a specific angle to the mast in order to catch as much of the wind as possible. The more wind the sails caught, the faster the *va'a* went. The angle that the sail was set to the mast was dependent on the angle the wind came to the *va'a*. If the wind changed direction, then so too must the angle of the sails. The responsibility of the *foeuli* was to continually make micro-adjustments to the *va'a* – using the *foe* – to catch as much of the wind as possible, and ensure the sails were always full of wind, while keeping the course.

An additional complication to the duties of the *foeuli* was that while 'reading' the wind, they must also 'read' the waves and current. Waves are the ocean's response to the wind – the direction of the waves generally follows the direction of the wind. But beneath the surface waves, there is a 'current' which is the below-surface, inertial flow of water. Often times, the currents and waves flow in different directions, and this can change the dynamics of surface waves. One such dynamic is what we call 'rogue waves'. On the ocean, 'rogue waves' are waves that differ in size, rhythm and direction to the flow of the predominating waves (that which is caused by the winds). For example, on this particular sail, the winds were causing two metre waves (also known as swells) coming from the direction of *Matau'upolu* from the 'house' of '*Aiga*, while the current was coming from *Sasa'e* but in a different rhythm and pattern to the swells. This dynamic would cause rogue waves 4-5 metres in height, coming at us from the *To'elau* direction, from the 'house' of '*Aiga*. Whereas the swells were waves that 'hit' us approximately every half second, the rogue waves would be approximately every ten seconds – a different rhythm to the swells. Essentially, a rogue wave coming from that direction 'hits' the *taumua*[45] first, inevitably shifting the nose of the *va'a* slightly north. Given that our sail configuration and *va'a* direction was specifically 'tuned' for the prevailing winds and swells, these rogue waves could profoundly alter our course if we did not accommodate them appropriately. Moreover, if we stayed facing north when the next rogue wave approached, it would hit us broadside, and could adversely affect our *va'a* with all manner of complications.

At that explanation, I was now able to discern which waves were the 'rogue waves', and I could also see how they were affecting the nose of our *va'a*, and accordingly, our direction. Ofa then showed me how to 'ride' the waves. He explained that the rogue waves were bigger than the swells, and as they came to us, it would lift our *va'a* above the swells. Once we get to the crest of the rogue wave, the *foeuli* needed to steer the *va'a* perpendicular to the rogue wave so that we would 'ride' directly down the 'back' of it. This would prevent the waves from tossing the *va'a*, and enabled the *va'a* to navigate the conditions better. Moreover, this would also help keep alignment to our course.

Once I was able to observe this phenomenon with Ofa's guidance, he instructed me to take the *foe* and use this opportunity to put what I had just learnt to practice. At first, I refused – I was terrified of getting it wrong, and in these conditions, the ramifications would be profound and immediate. Fani insisted that on the ocean, fear of the conditions would likely blunt the senses and impede good decision-making. Moreover, she added, the key to gaining competence was 'connectivity' with the elements, respect the conditions and then to steer with confidence in the knowledge I now had. Confidence, Fani reminded me, was achieved through navigating difficult conditions, under guidance. Fani added that listening and believing is not learning, but simply an acknowledgment of truth; for a 'learning' to become 'knowledge', I needed to enact it so that the performativity of the learning became embedded in my head, heart and spirit. Navigating with the head, heart and spirit was more reliable than navigating with head-knowledge, acquired through the aural senses only, or by only reading about it.

On those assurances, I remembered the connection I had with the ancient voyagers. I invoked their mana and implored their guidance through a short prayer. With that prayer, I felt a 'shot' of adrenaline kick in, and I focused my attention on the task at hand. I recollected Ofa's beginning routine of observing (or connecting to) the wind, observing (or connecting to) the waves, and then did the same. Once I gathered the information I needed, and connected my mind, heart and spirit to the wind, the waves and the *va'a*, I took hold of the *foe* from Ofa.

As I stood at the *foe*, I pointed out to Ofa what I thought was a rogue wave approaching – at this hour, in the darkness, and with the swells, the waves were visible by the sea spray and white caps that formed on the crests. It is also worth noting that when we stand on deck, we are standing three metres above the sea, so the swells were recognised by looking at them at about eye level as they approached from the starboard side, while the rogue waves were recognisable by looking forward towards the *taumua* of the *va'a*. When I pointed to what I thought was a rogue wave, Ofa acknowledged that it was indeed a rogue wave. I let the wave pick up the *va'a* to its crest at which point the *va'a* was now pointing directly north, and then I quickly walked the *foe* to the port side so that the *va'a* turned starboard. As expected, the *va'a* rode down the back of the rogue wave perfectly perpendicular, and at the same time, gained speed and momentum. This extra speed and momentum from riding down the back of the rogue wave set the *va'a* up perfectly for the next rogue wave, and I repeated the same procedure. Thus, not only were we now 'riding' the back of rogue waves, but this was adding slightly more speed to our *va'a*.

[45] *Taumua* – (Sāmoan) Bowsprit; bow (front) of the *va'a*.

I continued to ride the rogue waves, and with Ofa's guidance, I also continued to keep the direction of the *va'a* on course, and the sails full. After several minutes of this, I understood the regularity – the rhythm – of the sea and was able to anticipate oncoming rogue waves, and steered the *va'a* even straighter still. Tiatia Alex confirmed later that the half hour that Ofa steered, and the half hour that I steered immediately after, with Ofa's guidance, was the straightest the *va'a* had sailed throughout the night, and also the fastest we had travelled, and the most distance we had covered towards our heading.

It was exhilarating! I felt so alive, and so connected to everything. It was an incredible experience. Steering the *va'a* in such wild conditions was indeed an overwhelming experience; doing it made me feel invincible. But the invincibility wasn't from an ego point of view, but from the knowledge that I stood at the helm with my captain, a very competent and caring crew, my ancestors, the ancient voyagers, my God, and in a strange way, I even felt like I stood there with the wind, the waves and the current. And because I felt so connected to everything and everyone around me, I felt no fear nor trepidation towards the conditions. It was an incredible array of emotions and my senses were incredibly heightened; it was an extraordinary state of consciousness, to feel so alive, and alert.

After half an hour on the *foe*, there was a change in the *foeuli* – as noted earlier, we rotate the *foeuli* to make sure everyone's strength is preserved throughout the Watch in case of emergency procedures where we need strength and stamina to carry out certain duties. As soon as I came off the *foe*, Fani instructed that we had reached the point where we needed to tack, and head for 'Āpia. When I enquired as to how far we had travelled easterly, she replied that we had sailed easterly enough to reach a point about 40-50 kilometres north of the eastern-most edge of Upolu.

On that, Fani instructed me on my duty to perform when she called the tack. Once she instructed me, my mind immediately went to the fact that I had been practicing my knots and locking down the sheetlines with my eyes closed for such a time as this: in complete darkness. I was extremely excited that I had spent so much time practicing, and now that the crew needed me, I was ready; not a passenger, nor a learner, but a crew member!

That readiness quickly changed to disappointment when Mika cheekily said to Fani: "Just me and you." Mika, whose Watch was the previous one, stayed on deck with us. And now, after his Watch was uneventful, he wanted some action with *our* Watch. At the thought of Mika's suggestion, that is, a two-person tack – not counting the *foeuli* – Fani wryly smiled, and then said: "Yeeeaaahhh."

In *va'a* culture, Fani explained, if you are on deck, even if it was not your Watch, you were expected to help out; even though Mika was not on my Watch, he used the opportunity to perform his skills, and show his knowledge. Now, my disappointment quickly turned to curiosity: how can two people perform a tack? I had rehearsed it at the Sātuimalufilufi sea trials with at least four others, but *two* people? I *had* to see this.

On Mika's suggestion, and Fani's confirmation, Ofa took over the *foe* again. This was going to be a manoeuvre that required experience. Once all three were ready, Fani called out: "Stand by to tack!"

Ofa and Mika shouted back: "Standing by."

Fani shouted: "TAAAACK!"

On that cue, Ofa walked the *foe* all the way over to the port side, causing the *va'a* to take a sharp turn to starboard. As Ofa was making that move, Fani and Mika walked through the movements of the tack like true experts, not at all perturbed by the conditions. I watched in awe of their skill and knowledge, that they could perform – what seemed to me – a difficult task with composure. Although I had been looking forward to performing the tasks myself, watching these two experienced voyagers was a joy to behold. It was now embedded in my mind: the standard of skill that I needed to achieve was to be able to perform the 'two-person tack', and to do it in tempestuous conditions.

For the rest of my Watch, I continued to talk to Ofa about being the *foeuli*. While talking to him, I also continued to practice tying knots in the dark, and locking down the sheetlines.

The change of Watch at 2am was marked by Fani. She explained that when the stars were not visible at night due to cloud cover, it simply meant that triangulation of position would be difficult to perform, but an estimate

of position could still be determined by taking account of the speed of the *va'a*. The 'speed test', as we did it on the *va'a*, was performed by using the peel of a small fruit – either banana fingers[46] or orange – and dropping it on to the ocean at the fist *'iato*[47], then count how many seconds it took to reach the twelfth *'iato*, and with a simple guide[48], speed could be approximately determined. This would be done at regular intervals throughout the night. The Master Navigator would have an estimation of how much time had elapsed to determine how much distance had been travelled throughout the night, but more skilfully, the Master Navigator would be able to determine this through the pattern of waves, rogue waves and refracted waves[49]. This would then be confirmed at sunrise, then factoring the amount of times the wave patterns were repeated throughout the night. However, given that Tiatia Alex had not been counting wave patterns, we were relying on the clock to mark 2am and the change of Watch – usually, the Master Navigator would not perform any other duties on the *va'a* other than to navigate (which included counting waves and patterns) and would therefore always be mindful of time, distance and speed.

With the change of Watch, I decided to get some rest. I had six hours before my next Watch was back on deck, and it was likely to coincide with arriving at 'Āpia Harbour, so we would be the Watch that took the *va'a* into port.

Quite by chance, I woke up early from my sleep and decided to go on deck. It was 6am, and my Watch was due in two hours time. The conditions had eased slightly: two metre swells, and the rogue waves were about 3-4 metres; it was overcast and 'Āpia Harbour was in the distance, about 10 kilometres away. It was indeed a beautiful sight. I sat in silence, took in the moment, and remembered with awe and amazement what happened on my Watch only a few hours earlier. I marvelled at what I had just been a part of. Now that my eyes had been opened to voyaging and navigating, indeed, I felt different; I felt connected. The morning was spent catching up with the Watch, and we shared breakfast and shared stories as we continued to head to 'Āpia Harbour.

An hour later, I was privy to a conversation between Tiatia Alex and Fani. It seemed that we did not stay the course through the night, and had drifted to the west slightly. I learnt from Tiatia Alex that the GPS showed that through the night, after my Watch, we had drifted to the west, and although it equated to a one-degree shift off course earlier in the night, the continued course one degree off, in effect, resulted in landfall at the village of Sāle'imoa (refer *Image 1.3*), 20 kilometres west of 'Āpia Harbour. When I enquired as to why there was a slight shift west and what would have caused it, Tiatia Alex and Fani explained that it was likely that the Watch that came on after us did not accommodate the rogue waves pushing our *taumuli*[50] slightly west. In other words, heading north east, the rogue waves were coming on to our *taumua* shifting us slightly north, but after the tack, and heading south west, the rogue waves from the same direction were now pushing the *taumuli* slightly more westerly. Hence, the drift west.

To accommodate this, it was decided that we needed to tack again, head north east more, in order to get the correct alignment for a tack back into 'Āpia Harbour.

Fani discussed this with the Watch Captain of the current Watch. After the discussion, the Watch Captain called out: "Ready to tack!" His Watch kicked into action with the various Watch members calling out the station they were going to operate; I was looking forward to seeing if Fani and anyone else would perform the two-person tack, but not this time. Seeing everyone kick into action, though, was a remarkable sight: order amid the chaos.

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[46] In Sāmoan, they are called *misiluki.*

[47] *'Iato* – (Sāmoan) The crossbeams of the *va'a* that holds the two hulls in place, and upon which the *fale* is constructed.

[48] From the first *'iato* to the eighth *'iato,* it is approximately 15 metres. If it takes ten seconds for the banana skin to reach the eighth *'iato*, it means we are travelling at approximately 1½ metres per second, which estimates to three knots. If it takes five seconds, it means we are travelling at three metres per second, which estimates to six knots. If it takes three seconds, we are travelling at approximately ten knots. If it takes 1½ seconds, we are travelling at approximately 20 knots.

[49] Refracted waves are waves that are caused by 'bouncing off' from an object, usually landmass (land or reef).

[50] *Taumuli* – (Sāmoan) Stern (rear) of the *va'a*

The Wach Captain said to me that I was on deck, and therefore, expected to be available to crew. At that instigation, I smiled: I had been waiting to participate in a tack, and now I had been invited to do so with this current Watch. The Watch Captain looked at me and assigned me a station to operate. I was extremely excited, and ran to my assigned station. Along with the rest of the Watch, after a few seconds of jostling for position at the stations, each one shouted back: "Standing by."

Upon receiving confirmation that each station was ready, the Watch Captain shouted out: "TAAACK!"

The *va'a* became a hive of activity again as each person carried out the tasks required. Afterwards, when the tack had been completed, I let out a jubilant shout of joy: choooooo-hooo-hooooo! I had done it! I had actually participated in tacking the *va'a* on the open ocean. I was filled with joy, much to everyone's amusement.

A little later, my Watch emerged from the hulls to prepare to assume the deck and navigation duties. The Watch Captains exchanged information, and then Fani called out the change of shift, and my Watch was now on duty.

My Watch Captain put me as the *foeuli* first, so I asked for Ofa to be available to guide me, and he did so without hesitation. This time, with the conditions slightly milder than last night's, I found steering incredibly easier to handle. Everyone noticed the new confidence I now exhibited, and could see that I was changed after one night on the open ocean. However, there was still much to learn, and Ofa began to teach me how to anticipate the conditions, and therefore, how to keep the *va'a* straight.

Ofa and Tiatia Alex explained that, often, the *foeuli* responded to the conditions: when the waves come, the *foeuli* responds; when the wind comes, the *foeuli* responds. This approach, while it was acceptable, usually resulted in the *va'a* going off-course slightly, before being corrected by the *foeuli*. It is a *responsive* approach. This, they explained, was how most people steer. One of the problems of this responsive approach was that while the *foeuli* was able to make the corrective action to stop going off-course, they neglected to make a *restorative* action to return back to the *correct* course. That is, they neglected to make a necessary *further* adjustment to get back in line with the original course. This is what happened to the Watch that came on after us last night. A skilful *foeuli* learned to read the conditions, and steer the *va'a* in *anticipation* of the 'hit' from the swells and rogue waves, so that when it happened, the 'hit' put the *va'a* back into alignment of the prescribed course. It was indeed an amazing skill to learn, and Ofa spent my shift on the *foe* teaching me a couple of things to watch for – for example, ripples on the surface of the water is a give-away of approaching wind, as well as observing the flight patterns of birds) to help with anticipating the conditions.

After a couple of hours, Fani signaled that it was time to tack back towards 'Āpia. At that signal, my Watch Captain called out: "Stand by to tack!"

The Watch Captain assigned my role for the tack, and the *va'a* became a hive of activity again. "Standing by" we all shouted back from our respective stations.

"TAAACK!"

On that instruction, the *va'a* tacked back towards 'Āpia.

Ofa was put back on the *foe* to get the alignment right. After a few minutes of doing so, I noticed that the *va'a* was going noticeably faster. I looked at him inquisitively, wondering what he was doing differently that was giving the *va'a* more speed. He saw my quizzical look, and motioned for me to get back on the *foe* again with him. He explained that he was going to teach me one more skill on this tack back to 'Āpia: he was going to teach me how to *surf* the rogue waves.

I gasped in awe. How was such a thing possible?

Following on from the teaching of how to anticipate the conditions, Ofa showed me that a further skill to the 'art of anticipation' was to eye up an approaching rogue wave, and in anticipating it, steer the *va'a* perpendicular to the *front* of the wave so that the *va'a* rode, or *surfed*, the wave. This was where the increased speed was coming from. However, Ofa explained, the *va'a* couldn't ride these rogue waves for too long because they would take the *va'a* too far off course – the rogue waves were, after all, heading in a more

westerly direction to where we were headed. Ofa added that the *foeuli* just needed to ride the wave for a few seconds to build the momentum, and then swing the *va'a* back on course: added speed, and course alignment. It was incredible, and I was in disbelief! Not only was *Gaualofa* a traditional voyaging *canoe*, but now it was a 12-ton *surfboard*! And I am the surfer!

After my shift on the *foe*, I spent the rest of the time talking and learning more. We were arriving at ʻĀpia Harbour, and our voyage was about to draw to a close. Whenever we exited and entered harbours, it was all hands on deck, so all of the crew were now on deck and assuming the necessary roles to bring the *va'a* safely into port. On this occasion, the *va'a* had some community duties to perform, so our arrival into ʻĀpia Harbour was not to berth at the marina, but to beach on to ʻĀpia Beach. Our arrival at ʻĀpia Beach brought an end to my first voyage on *Gaualofa*, but the beginning of my search for traditional navigational knowledge.

Malu: the original starpath

I mentioned earlier in this paper that I was undertaking doctorate research on the *tatau*. While learning traditional navigation, six members of the *va'a* – including myself – had traditional *tatau*. Two of them were Captain Fani, and Tiatia Alex. Accordingly, they became participants in the *tatau* research. Recalling also earlier in this paper, that the Master Navigator learnt how to embody knowledge as a way of retaining and easily accessing those knowledges, one exceptional way knowledge was embodied was marking the skin permanently, viz. *tatau*. While discussing her *malu* story, Fani talked about the association of the *malu* and traditional navigation.

> Fani
>
> 2009, that year, about four months of training and then 2010, this was the big training year . . . . So it was nine representatives from Samoa, one from Tonga, four from Vanuatu. We all gelled, it went smooth. The, the feeling of after, 29 days away [at] sea, you're just jiving and jamming and being full-on with your crew, and it's a crew of 14-16 and that that's all for 29 days and you land and you see this beautiful island and these beautiful smiling faces, beautiful culture; it's just, it's once-in-a-lifetime experience. . . . With the other countries that came, that was part of this, we were all, they had their different tattoos, *tatau's*. While we were in Mo'orea, one of the Society Islands, I think, there was this picture, this old, old picture in one of the lady's, our hosts, and it was a tattoo, she said it's a Fijian; she was told it's a Fijian, she was told it was an old Fijian lady having a tattoo. Fijian lady, bare-chested, little sarong made out of sinnet, and her tattoos were up, just up to here [pointing to mid-thigh], mid-thigh and all the way up to here [pointing to hip], and they were all just lines . . . triangles, upside down triangles, but otherwise they were just lines, all around, all around here [points around her girth]. And I was like, nah that can't be Fijian, what? I don't know, apparently it was. Spoke to the Fijians who were also on the same voyage and they said yes, they're all from the Lau islands; Lau group are the Polynesians. They have similar tattoos, that's where the tattoo is strong there, yeah? So it was pretty awesome in that sense.
>
> Sonny
>
> Had you had your *malu* by then?
>
> Fani
>
> No, I didn't. Along the voyage, because the voyage just became a, the whole thing just became a how, how did our ancestors do it. How, how, how could they avail themselves? How could they keep strong? In prevailing and keep going, right? What, what made them think to keep, keep going? You know, instead of just giving up, you know? Strong winds, give up man. First island? You know, that's with just 29 days with us; I'm sure they done over, you know. But they prevailed, they stayed at it; they went from island to island to find the perfect place, or the place where they thought there was right for them. . . . And after the voyage, I just, I became, I realised I was ready; I was ready, I hoped that I was ready. Or at least I, what I had learnt, and what I had came [*sic*] back with the voyage, I hoped that pre-text, I was ready.

As we continued our discussion, I asked Fani if the *Tufuga* explained the patterns:

Fani

> Yes he did. Because the story that was given to him was about, was my journey on the *va'a*, my first time on open ocean, 29 days away not seeing land was just a beautiful sight, seeing smiling faces was a beautiful sight, and then on our last month at the voyage we started learning traditional navigation using the stars and the waves. So, he started off, the first thing he did was actually, do my knees and that was where he started doing the stars. He first sussed out how to get to land, and then he started going up to my thighs and starting doing land, like actual formations of land, and he started talking . . . a lot of it was mostly that, the mountains that he said I described; he said a lot of it was the waves, the mountains and the wind with the stars, but the first thing he did was actually the stars.

It was a profound description of the *malu* that left me astonished: the *malu* marked the night sky, and pathways to islands, used by the Master Navigators. Much later, as I continued to learn about traditional navigation[51], I found another link between the *tatau* and traditional navigation in the most unexpected of places. I came across a Tongan historian[52] who was describing[53] the navigation aspects of a Stonehenge-type structure in Tonga, *Ha'amonga 'o Maui*[54] (refer to *Image 1.9: Ha'amonga 'o Maui*).

Image 1.9: *Ha'amonga 'o Maui* stone structure
The stone structure, *Ha'amonga 'o Maui*. There are other large stones close by and are believed to have formed more of the original structure.

[51] It should be borne in mind that most, if not all, Pacific nations shared the same navigation traditions. Thus, in trying to learn about Sāmoan traditional navigation, I wanted to see what could be gleaned from other Pacific nations.

[52] While his writings are considered non-academic, he is receiving critical support from many parts of Tongan knowledge-keepers, including Tongan academics, historians and nobility.

[53] http://thfale.com/page/2/

[54] *Ha'amonga o Maui* – (Tonga) Translates as 'Maui's burden', and refers to a star named *Ha'amonga* (in Sāmoan, *'Amoga*) that Maui used.

The *Ha'amonga 'o Maui* stone structure is located in the north side of the main island of Tongatapu. Among Tongan historians and knowledge keepers, it is believed to be the marker of times and seasons, including marking solstices and equinoxes. Furthermore, it is believed that the *Ha'amonga 'o Maui* structure is the remnant of a grander structure; there are other large stones in close proximity. Explaining its purpose, Fale (2014) stated that "the *Ha'amonga 'o Maui* is a duplication of the heavens", adding that it is a physical representation of a constellation used by traditional Master Navigators. Fale also showed drawings of an engraving on the crossbeam of the *Ha'amonga 'o Maui* (refer to *Image 1.10:* Ha'amonga 'o Maui *engraving*).

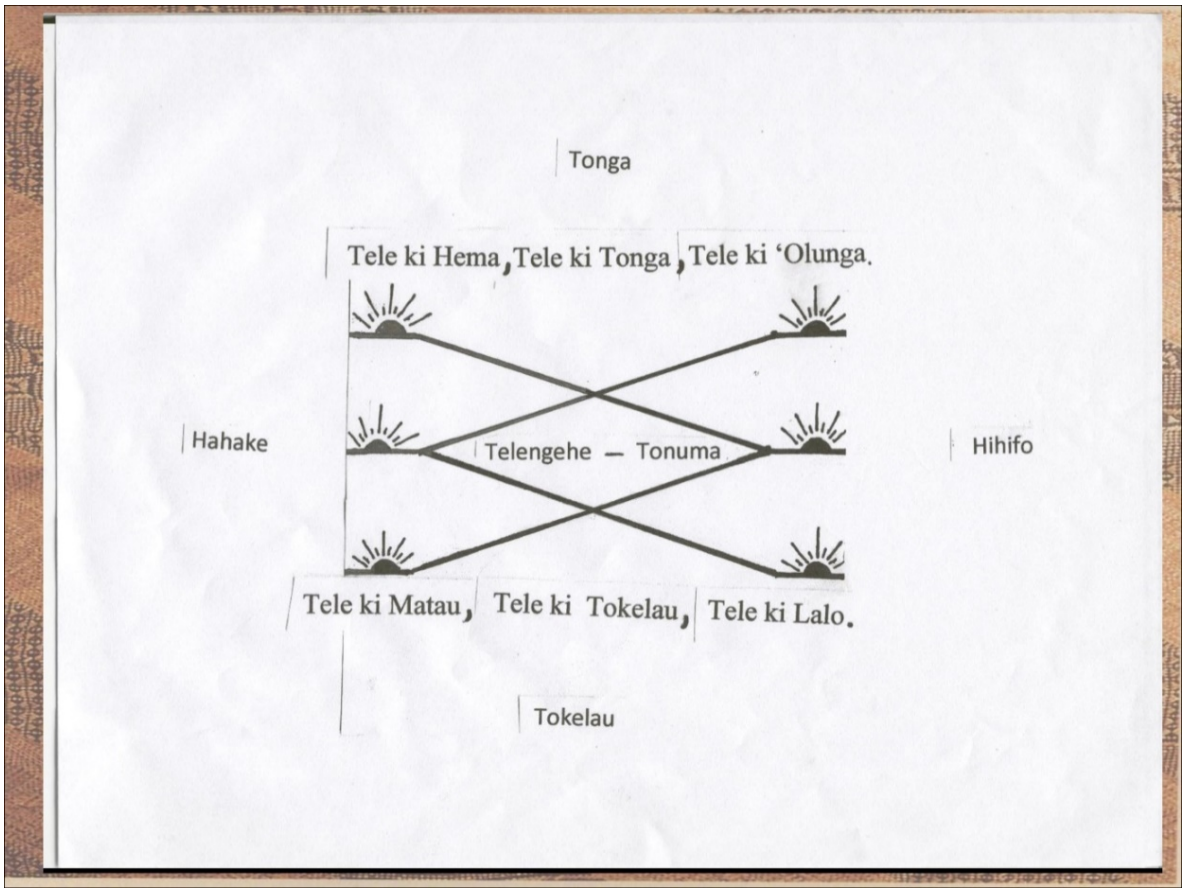

Image 1.10: *Ha'amonga 'o Maui* engraving[55]
The lines in the image above are reflective of the image found engraved in the horizontal stone of the *Ha'amonga a Maui* structure.

Moreover, in explaining the purpose of *Ha'amonga 'o Maui,* Fale added another illustration that depicted the movements of specific stars and constellations, and their utility in traditional navigation (refer to *Image 1.11: Tongan images of star movements*).

[55] Picture retrieved from http://thfale.com/introduction-ancient-tongan-navigational-compass/

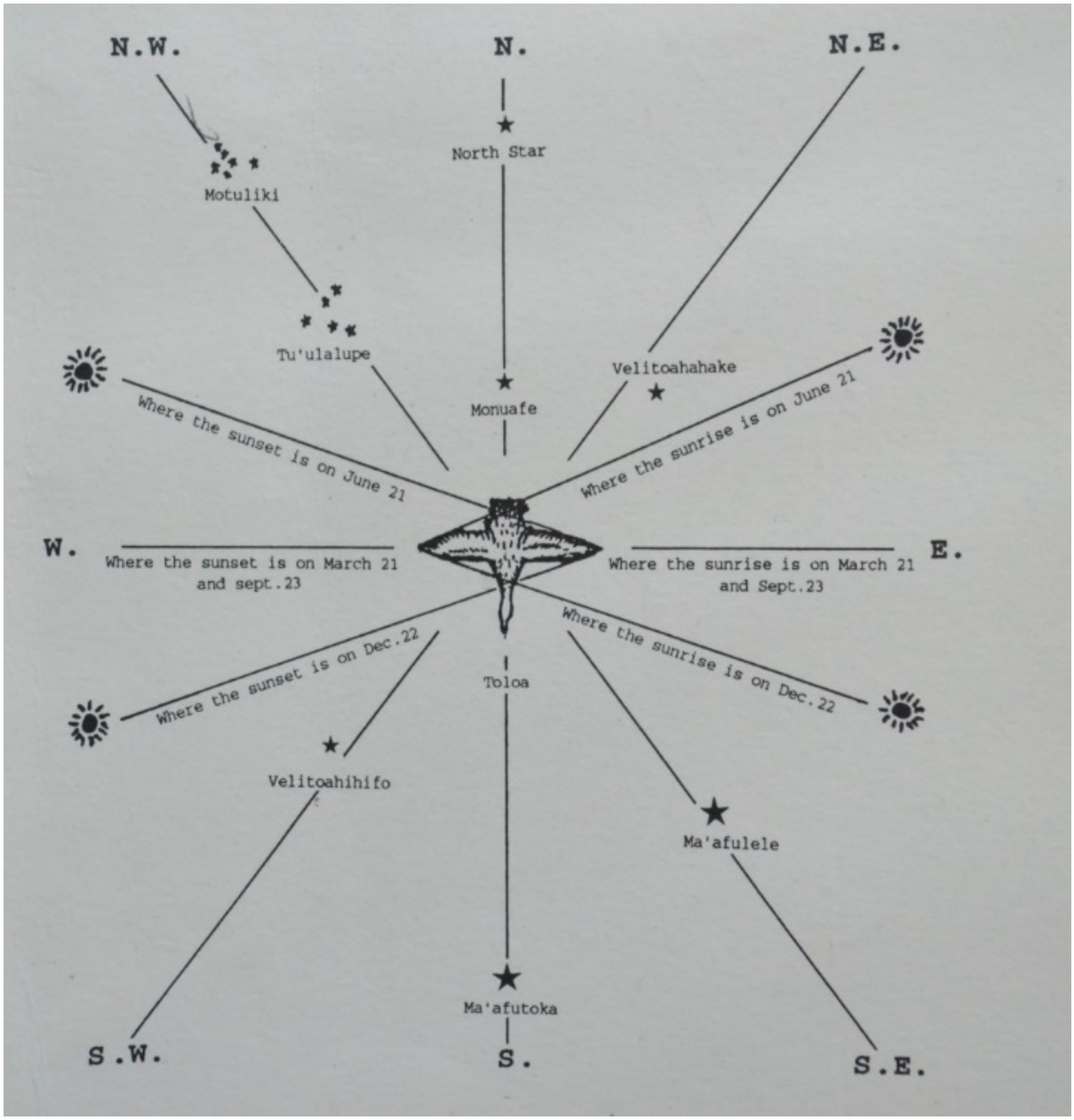

Image 1.11: Tongan image of star movements[56]
This drawing depicts the value of the constellation *Toloa* and its utility in aligning other principal navigating stars.

Again, I was dumbfounded at the sight of these two images; these images were familiar to me. I turned modern technology to review some of the images of the *malu* online (refer to *Image 1.12* and *Image 1.13*), and I was astounded to find congruity between Fale's images of Tongan traditionl navigation, and the Sāmoan *malu*.

[56] Picture retrieved from http://thfale.com/haamonga-origin-constellation/

Image 1.12: *Malu* pattern depicting the *Ha'amonga* engraving[57]
The part to take note of is inside the blue box. Compare this with *Image 1.10*.

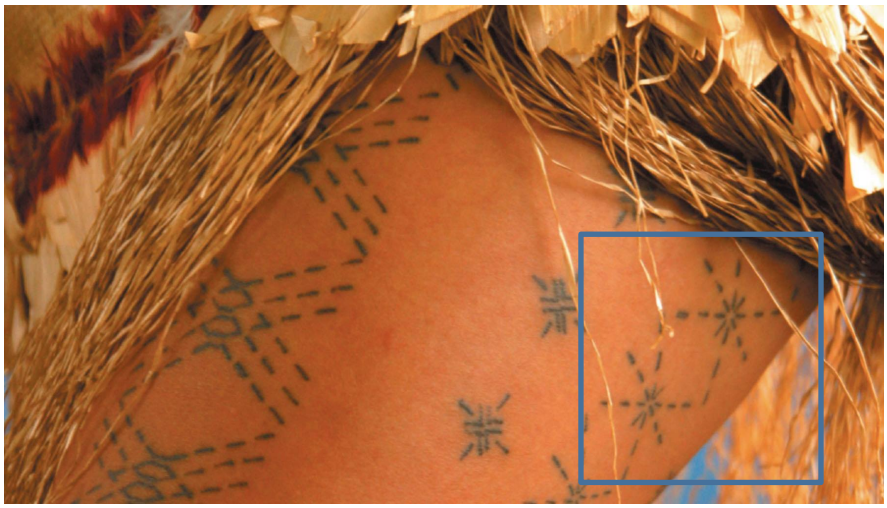

Image 1.13: *Malu* motif depicting 'the heavens'[58]
Compare the image inside the blue box with *Image 1.11*.

[57] Picture retrieved from https://www.google.com/imgres?imgurl=https://i.pinimg.com/originals/b8/73/7a/b8737a0930e0488bb69caed4804fa749.jpg&imgrefurl=https://www.pinterest.com/pin/423619908670908402/&h=424&w=270&tbnid=wgQcmr7x7iWPSM&q=malu&tbnh=281&tbnw=179&usg=AI4_-kTn3sXyNc4J0Q_xv0Y_FB7-9BEKNw&vet=1&docid=p0mm1gSkCmgOUM&itg=1&hl=en

[58] Picture retrieved from https://i0.wp.com/pacificguardians.org/blog/wp-content/uploads/2014/10/Malu.jpg?resize=300%2C169

Fani's statements about the *malu* and the starpath is confirmed: the *malu* is not a *reference* to the original starpath, it *is* the original starpath. In other words, the *malu* was how the *Tufuga* stored knowledges about specific astronomical structures – constellations, star pairs and star sets – as pathways to specific islands. Moreover, women – particularly those that wore the traditional *malu* – were also Master Navigators, and were part of the guild of Master Navigators. This is evidenced in Sāmoan folklore, where stories of female Navigators abounded, most notably, the fabled female twins, Taemā and Tilafaigā – credited with introducing *tatau* to Sāmoa – and their bestowal voyages that gifted the *tatau* instruments to select lineages. Furthermore, the role of women in connecting the traditional navigation and traditional *tatau* is also brought to the light, a significant body of knowledge that has been lost over the centuries – further traces of the erasure of indigneous knowledges and histories as a result of missionisation and colonisation. An observation of the more recent *malu* shows the motifs in a columnal and linear design and structure, but there are many current accounts of the *malu* patterns of mothers, grandmothers, and great-grandmothers long since passed, whose patterns appeared random and sparse, akin to Fani's.

Interestingly, the fact of Tongan history speaking to Sāmoan history is also a curious observation. This lends to an earlier point, where not only are many aspects of traditional navigation universal among the peoples of the Pacific, but a more salient matter that this alludes to is the one-ness of the people. That is, modern-day national borders render the nations of the Pacific as different nations, but historically, genealogically, and traditionally, the people of the Pacific are in fact one people. But that is another story, for another time.

Conclusion

This paper has been about my journey of learning traditional navigation, while I lived in Sāmoa. As I have shown throughout this paper, it was an incredible (beginning to the) journey! There was so much to learn, and indeed, I learnt so much; my spiritual experience – in essence, my first encounter with the *va'a* – set in motion what was to become an unforgettable journey, forever etched in my heart. The many bodies of knowledge that comprise the knowledge base of traditional navigation astounded me. Learning of the value of birds – their utility in open ocean navigation, and especially that the so-called 'crab-claw' design of the sails were in fact *not* designed after a crab's claw, but a *bird's tail* – left me flabbergasted. The fabled starpath and its functionality was exceptionally eye-opening; I was particularly dumbfounded at learning the explanation of 'fishing up islands', and the verity of Maui's adventures. And then to navigate by the stars was truly amazing. Moreover, to learn that the starpath – amongst other key knowledges – was embodied for the sake of ease of access and ease of use, revealed the extraordinary knowledge embedded in indigenous oral traditions; in many respects, the *va'a* and the *malu* were living libraries, an organic archive of knowledge.

In bringing my learning journey to the light, I also wanted to demonstrate the transformative power of knowledge, in particular, recovered ancient indigenous knowledge. As I learned traditonal navigation, I found myself changing; I found myself being transformed by this restoration and revival of knowledge. As I have documented the learning journey, I also wanted to show what those learnings did for me, what it meant to me, and how it changed me. I wanted to show not only the bodies of knowledge that were there to be learnt, but I wanted to show that it was more than just an intellectual ascent; it was also a spiritual and emotional journey, of growth, of enlightenment, of transformation. My desire to restore the *va'a* and *tatau* as 'living libraries' is to make these knowledges available to people who are also looking, and finding their way.

Blessed be your journey.

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