'Although there is still a great deal of work to be done on exactly how the systems work and on the details of the differences between the systems, there is no longer any reason to doubt that Pacific navigation is an ordered systematic body of knowledge that enabled the Pacific Islanders to discover and successfully occupy the majority of the hundreds [actually thousands] of islands scattered across thousands [actually tens of thousands] of square miles of open ocean. Such a knowledge system is clearly on a par with that of Western navigational science. Indeed, Pacific navigation is the most outstanding example of a knowledge system that can be compared with Western technoscience in this way.'

For most of human history, Pacific Islanders were the greatest of sailors and navigators. It took the peoples of Europe until 1336 to discover the Canary Islands, and the wind (as Alfred Crosby has put it), only a few hundred miles of the African coast. By this time Pacific Islanders had found every inhabitable island, most of which were comparatively small, spread over waters that spanned more than one quarter of the globe. This remains one of the dazzling human accomplishments; one that has puzzled and inspired scholars since.

These navigations were not the fruit of a single knowledge tradition, but of dozens. This comes as no surprise to those who are aware of the region, but may be surprising to

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those who are not. For although the modern population of the Pacific Islands is not large, perhaps around 15 million, it is spread over around 1/3rd of the globe, and contains something like 1/3rd of human linguistic diversity. Though on the whole the U.S. academy overlooks this region, its amazing diversity is the setting for histories that are both immense in scope, yet, almost paradoxically, often small in scale. This was itself reminiscent of the navigational knowledge, as different islands and cultures developed ways of traveling between small land masses in the most immense of oceans.

Here I will focus on one particular manifestation of navigation and seafaring which occurred within a much larger, and even more expansive, setting. The particular manifestation is Samoan knowledge about navigation and the sea, and the larger tradition is ‘Polynesian’ navigation. Navigation is a privileged point of entry for studying Samoan knowledge. For one, Samoans were islanders, and the sea was an integral part of everyone’s lives and histories. For another, maritime knowledge was a point of intersection of several different branches of Samoan knowledge: of the sea, coast, and reef; of flora and marine 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 (as well as others). To fully come to terms with all of this is beyond the reach of this paper, though it should be clear from the outset that the panorama in which this smaller story takes place is vast, like the ocean that joins Samoa to the rest of the world.

Pacific Islanders considered the sea not so much as a barrier, but as a connection to other places. This point, made most recently and powerfully by Epeli Hau’ofa, has long been observed by islanders, and a few scholars. One of the Samoan words for the ocean, vasa, draws from the root word of va, which names the space, or relationship—the dynamic tension—between places, objects and people. This was demonstrative of the

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3 The Pacific Islands, as an academic convention, run from New Guinea to Easter Island west to east, and Hawaii to New Zealand north to south.
4 ‘Polynesia’ was one of the four distinctions made by Dumont D’Urville in 1832 (Mela/Micro/Polynesia and Malaysia); these are troubled distinctions, particularly the racism that underlies ‘Melanesia’, but Polynesia remains a usable distinction. On these concerns see Nicholas Thomas, "The Force of Ethnology: Origins and Significance of the Melanesia/Polynesia Division," Current Anthropology 30 (1989).
5 Epeli Hau'ofa, "Our Sea of Islands," The Contemporary Pacific 6, no. 1 (1994).
Samoan approach to the ocean; as an archipelago the sea was what facilitated the existence of Samoa as an entity: even Samoan political boundaries incorporated seaways as well as proximity on land. The Pacific looks radically different if you see the sea as a means of communication and travel, rather than as a barrier, and it was knowledge and technology for engaging with the ocean that allowed islanders to see it one way and not the other.

Constituted by the sea, the Samoan archipelago was also connected to a wider collection of islands and archipelagos that helped shape its history. Along with the archipelagos of Fiji and Tonga, and the islands of Uvea and Wallis, Samoa was a part of a network of relations that was probably as old as human settlement in the region (2500-3500 BP). Samoa, Tonga and Fiji each had senses of ‘national’ unity, despite important distinctions and divisions, and Tonga and Samoa had not only histories of centralized leadership, but strong traditions of leadership over entire archipelagoes. Traffic between the archipelagos, importantly but not only between elites, meant that their histories were deeply entangled with each others, though far from shared. Fijians, Tongans, and Samoans play critical roles in each other’s histories. Certain material items and practices, were associated with people or knowledge stemming from these different archipelagoes. Prior to, and shortly after, the arrival of European voyagers, Tonga had expanded its realm of influence to include much of this western Polynesian region, including periods of heightened influence or imperialism in Samoa and Fiji. There were even Tongan raids on Polynesian ‘outliers’ (settlements of Polynesians in predominantly ‘non-Polynesian’ areas) over a thousand miles away. These included Tikopia, Anuta, Sikaiana, and Nukapu, on the Santa Cruz Reef islands. Samoans went as far afield as Tuvalu and Sikaiana (over 1000 miles). The broader point that is relevant here, though, is that the maritime technology and knowledge of Samoa, Tonga, and Fiji, were distinctive, yet inextricably connected.

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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? If such questions were asked by any number of 17th, 18th, and 19th century voyagers, western scholars have hardly stopped asking it since.

A large part of the European surprise was not only that there were people on every sizeable island in the Pacific, but was more specific to what became known as Polynesia. As Cook observed, the people of Hawai’i spoke a language so similar to the peoples in Tahiti and New Zealand that they could understand each other, even though several thousand miles of ocean—which westerners had only just discovered—separated them. ‘How shall we account for this Nation spreading itself so far over this Vast ocean? We find them from New Zealand to the South, to these islands [Hawai’i] to the North, and from Easter Island to the Hebrides.’\(^9\) Cook, and through him, Europe, had come across a people more widely dispersed than was hitherto imaginable. Whole taxonomies, such as Blumenbach’s, changed in response. But what has been little commented upon is that Polynesians themselves, though not at the time in contact with the furthest extremes of settlement, were not surprised to find such close relatives so very far away. One of the great mysteries of western scholarship, how the most remote and scattered islands came to be settled, was to the Polynesians themselves, no mystery at all.

This should have come as no surprise. No less able a sailor than Cook was quite clear about the seriousness and ability of Polynesian seafarers. This is unsurprising, for it must have been obvious. The largest Polynesian vessels were above 100 feet—that is,

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longer than Cook’s first vessel, the *Endeavour*. Some accounts suggest they could accommodate as many as 150 people, though the optimal size for long passages were those of middle size, around 50 or so feet. Cook himself adjudged the Tahitian *pahi*—a double-hulled vessel similar to what Samoans called ‘*alia*—easily capable of 120 miles a day (modern experiments suggest 100-150). ¹⁰ Cook also logged a Tongan catamaran at 7 knots close hauled, and both of these measures meant the vessels were significantly faster than the *Endeavour*: in one sailing race the *Endeavour* was outsailed 3 miles to 2 (though the *Endeavour* was chosen for her sturdiness, not her speed). Yet for all of their capacities, these Polynesian vessels came simply to be called ‘canoes’ by Europeans, as misleading a term as calling the seafarers who built and sailed them ‘savages’. Even Cook himself came later to doubt the abilities of Polynesians, made skeptical by men of science who were themselves struggling with problems of navigation and geography, and could not fathom how savages might manage.¹¹ Though Cook had himself seen the vessels at sail, though he had seen at first hand the extent of Tahitian navigational knowledge, and although he had been given sailing instructions from Tonga to an atoll 1,170 miles to the north, his inability to come to terms not so much with what Polynesians knew, but as I will later argue, *how* they knew it, made him a doubter.

The proof of Polynesian navigational knowledge was evident not only in their presence throughout the Pacific, nor simply in the histories and languages of Polynesians, but in the very practical examples that were made evident to voyagers. This evidence has never entirely discouraged the recurrent suggestions that these voyages were drift or unnavigated voyages, as popularized by Andrew Sharp and Thor Heyerdahl.¹² Underlying such views are histories of seeing Pacific Islanders as simple, artless subjects rather than agents of history. Both Heyerdahl and Sharp had to marginalize or ignore the

¹⁰ Ibid., vol 1., 157.
weight of evidence that Polynesians were competent sailors and navigators. Computer models have since shown that thousands of random drift voyages would not result in a single landfall on places such as Easter Island or New Zealand. Geoff Irwin has gone further, and detailed an archaeology of the possible, and probable, which offers a practical and nuanced discussion of Pacific Island navigation, one which moves beyond both the earlier overestimates of Pacific Islanders’ maritime abilities, and the unconvincing, if thought-provoking assessments to the reverse. Evidently Polynesians explored and settled the Pacific using ships, technology and knowledge developed over centuries of voyaging and navigation, and developed strategies that effectively took advantage of local circumstances.

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The debate (perhaps more of a debacle) generated by Heyerdahl, and particularly, Sharp, had the result of reinvigorating research into Pacific Island, and particularly Polynesian, voyaging. A number of experimental voyages beginning in the 1960s, most notably those by David Lewis under Micronesian navigators such as Hipour and Tevake, and by a reconstruction of a Hawaiian catamaran, the *Hokule’a*, demonstrated the viability of sailing very long distances onboard ships of Polynesian design and navigating without instruments. Much of this knowledge came out of research by Lewis, which had been bolstered by working with navigators in Micronesia and on Polynesian outliers who were still masters of instrument-less navigation. In Polynesia practical experience in making voyaging vessels and navigating was sparse, as most experts and practitioners were no longer at work. The voyages of the *Hokule’a*, in particular, were dramatic: her

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maiden journey between Hawaii and the Marquesas was widely noticed, and become symbolic not only of past achievements, but of present struggles, particularly that of continued native Hawaiian resistance against the U.S. empire. Since then the navigational knowledge of Pacific Islanders—especially Micronesians, and amongst them especially Carolinians—has become a fixation for many westerners. The body of literature on Pacific Island navigation is enormous: one annotated bibliography on the topic is nearly 300 pages long, and it is over ten years’ old. Sailors, military men, geographers, anthropologists, archaeologists, psychologists—even a presenter of This Old House—have written about ‘traditional’ navigation.

These journeys, and the reconstructed sailing vessels themselves, have become potent symbols of contemporary Pacific Island cultures, societies and identities. A voyaging revival throughout the Pacific has occasioned great interest amongst islanders in their own, and other Pacific Islander, voyaging histories. Parts of Polynesia as diverse as Tonga, New Zealand, Hawai‘i and Rarotonga have built ships recalling or recreating older ones, and Micronesian navigators have journeyed throughout the Pacific to instruct a new generation of navigators. The new seacraft have become vessels not only for sailing and navigating, but vessels of identity that enable contemporary islanders to navigate their way through their contemporary world. These are all developments have been well-documented elsewhere.

My purpose here is to think more specifically about Samoan navigation, to sketch out its broad outlines and several contexts and ask the preliminary question of what happened to it. Why would a developed, effective, functional and apparently key knowledge disappear? This is not to pursue the by now seemingly tired question of ‘is it science?’ Such questions have their uses, but I want to suggest focus on a different kind of historical understanding, that is the history of comparisons (a point I will return to). Rather here I want to pursue a multiple contextualization of Samoan navigation, seeing it

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within broader Pacific Island navigational knowledges and within some of the specifics of imperial and colonial encounters. I also want to consider some of the repercussions of using ‘science’ as a framework of inquiry or comparison, less to see whether or not Samoan or Polynesian navigation ‘qualifies’, and more to explore how the competencies suggested even by these kinds of questions helped define the operations of colonialism and imperialism, and in a broader sense the encounters between western observers and Polynesians. Ultimately, the differences that were entangled in these complex inquiries were to play a significant part in histories of the ‘forgetting’ of Samoan navigation.

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Compared to the extensive work on much smaller islands or island groups in the Pacific, it seems that little is actually known about Samoan navigational knowledge. This is unsurprising, as most of the Pacific Island navigation systems that are widely known or documented in academic literature are those that were studied since World War Two. Prior to this there were very few scholars who were sufficiently interested in, or sufficiently capable of, learning about systematic navigational knowledge in the Pacific. Consequently the bulk of what has been learnt has come from Micronesia, not Polynesia, and from within Micronesia it has mostly come from particular islands with especially strong navigational knowledge bases. Foremost amongst these are islands such as Puluwat in the Caroline Islands, which still have significant numbers of knowledgeable navigators. These navigators have been privileged in recent studies as most were non-literate, and thus their instructions to western and academic researchers, and the demonstration of their considerable abilities, were seen as uncontaminated by colonial or western knowledge.

The historical evidence that remains suggests that there was much more to Samoan navigation than was ever fully comprehended. One of the few scholars who encountered Samoan specialists and was himself interested in navigation, was unable to learn as much as he had hoped. The most important colonial ethnographer of Samoa, Augustin Krämer, spent an entire night with a Samoan chief, Leiato, who was at the time (circa 1900) one of a limited number of Samoans still well versed in astronomy and navigation. Leiato
had little success with his student: ‘I must admit I did not grasp everything’, Krämer later wrote, ‘because I am not much of an astronomer nor did the whole affair seem to me to be quite simple.’\textsuperscript{19} Kramer noted that some of the knowledge Leiato possessed seemed quite vague, but was under little doubt that it was still an impressive body of knowledge. These were methods, he wrote, which presupposed ‘good training, much experience and great powers of observation. And those were well developed, which explains why it was possible for the Polynesians … to maintain traffic between their groups of islands without either compass or sextant.’\textsuperscript{20}

Very few descriptions of navigational technique remain, and the major ones are not very detailed. ‘O le Tala i le Folauga a Gaiuli ma Gaisina’ (The Account of the Voyage of Gaiuli and Gaisina) is the most important of these, and was also collected by Krämer. It is only a brief account, yet though not particularly revealing in many respects, it at least indicates that some key navigational practices common through Polynesia and Micronesia (and better studied elsewhere) were in use in Samoa. For instance, there was the reliance upon landmarks for initial bearings, an technique in common use at the outset of voyages throughout the Pacific. More importantly, the story details the use of sequences of rising and setting stars to maintain bearings. This was a major element of navigating, still in everyday use in some parts of the Pacific. Its use in Samoa is confirmed by the known ‘star courses’—notably the key bearing for Tonga.\textsuperscript{21} However, because the passage described in this account is comparatively short (only around 80 miles), it hardly scratches the surface of knowledge necessary for the longer passages—the passages which made Polynesia possible, and kept its different elements in contact. Nonetheless it is revealing:

‘E o’o mai i ona po nei, ‘a o ni malaga i Tutuila po’o Manu’a e va’ava’ai lava i fetu. Ona folau a ‘i lea o le va’a e maua lelei ai lava le alava’a i Manu’a ma Tutuila.’\textsuperscript{22}

\textsuperscript{20} Ibid., vol.2, 285.
\textsuperscript{21} This was the Amoga, which was Orion’s belt. John B. Stair, \textit{Old Samoa: Or, Flotsam and Jetsam from the Pacific Ocean} (London: The Religious Tract Society, 1897), 286.
\textsuperscript{22} Krämer, \textit{The Samoa Islands}, vol.2, 283.
[Now when a travel party goes to Tutuila or Manu’a, it watches the stars extremely closely. So the ship travels and finds its correct course to Manu’a and Tutuila.] One should be hesitant in extrapolating too much from a unique document, yet from the language of the description it is apparent that observation was a cornerstone of Samoan navigation. This coincides with other evidence: for instance, an expert in matters of the sea and navigation was known as ‘matatai’, an observer of the sea.

Perhaps it is most revealing that as sympathetic an observer as Krämer was surprised that he could not learn an entire astronomical and navigational system in a single night. Of course, in retrospect this seems hardly surprising. David Lewis, one of the great twentieth-century sailors, and a competent astronomer, himself found that learning from non-literate Pacific Island navigators involved intense preparation, lengthy notes, a star chart, as well long periods of instruction and demonstration. Krämer’s surprise is indicative of the constant deprecation of indigenous knowledge, one almost uniform throughout the Pacific region in the pre-colonial and colonial periods. It was only on very rare occasions that indigenous knowledge was taken seriously, and these impulses constrained and guided the assembly of the colonial archive: the (colonial) archive is subsequently quiet on these kinds of concerns.

The nature of the archive is a difficult, but not impossible, impediment to investigating Samoan navigation. It is troublesome not only for its absences, but its presences: much of the discourse reveals rather less about Samoans than they do about observers. Many missionaries or observers associated with the colonial or imperial establishment thought Samoans incapable of, or not disposed to, ocean voyaging and navigation. George Turner called Samoans a ‘domestic people’ who ‘rarely venture out of sight of land’, and another observer echoed his thoughts, saying that ‘Samoans are singular among the peoples of the Polynesian race in not being fairly entitled to the name of Navigators’.

However, many sources indicate quite the opposite: that Samoans were commonly navigating the seas around the archipelago. Fishermen from the western island of Savai’i are known to have been working the ground at Pascal Bank, which was

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80 miles west of Samoa, a reef that was between 8-13 fathoms deep and in no place appeared above the surface. Such a passage was a difficult task, requiring an exacting navigation.

Other voyages that are known or suspected to have been made by Samoans in the centuries prior to the advent of Europeans also suggest a substantial capacity. Aside from the regular contacts with Fiji, Tonga and the surrounding islands (up to 750 miles away), there is evidence of varying quality for voyages of over a thousand miles distance. The island of Manu’a clearly had some significance throughout western Polynesia, as both Fiji and Tonga have traditions acknowledging it as an early site of influence. Contrary to what some observers have suggested, although travel beyond Samoa was extraordinary, it was hardly unheard of. As I have argued elsewhere, nineteenth-century Samoans were ‘travel-happy’: constantly on the move, with entire villages often at sea visiting other villages. The capacity and interest in travel may have changed in destination and mode of transport in the last century, but has hardly diminished.

Certainly the seaworthiness of Samoan seacraft underscores the evidence and suggestions that Samoans were capable of passages of significant distances—upwards of 1000 miles. By the time Papalagi—non-Polynesian foreigners—were regular visitors, at the start of the nineteenth century, there were three main types of vessel in use for offshore sailing. The smallest was the 'iatolima or soatau, a large outrigger canoe which was of ‘dugout’ construction. These could be as long as 20 metres (60 feet), and could carry from 3-4 to 20 or more sailors. The largest noted in the nineteenth century had hulls wide enough to accommodate two sailors paddling side by side—but were generally in the smaller range of 15-25 feet. The 'iatolima was mostly paddled, though it would be equipped with a sail when appropriate or necessary. By the end of the

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26 This account of Samoan vessels, their construction and handling, draws from visual sources and the especially the following: Peter Henry Buck, *Samoan Material Culture* (1930), Krämer, *The Samoa Islands*, Lewis, *We, the Navigators*, Sean Mallon, *Samoan Art and Artists/O Measina a Samoa* (Honolulu, HI: University of Hawaii Press, 2002).
nineteenth century these craft were not often sailed, but knowledge of their ability and operation was very widespread, and so is thoroughly evident in the colonial archive.

It was a considerable step up from the 'iatolima to the va’alo, the bonito boat, and its larger cousin, the amatasi. These were plank built vessels, the mainstay of those who fished offshore, and would comfortably operate far beyond the sight of land. The design of these vessels, is in remarkable contrast to western techniques of construction. The planks were (and are) cut and fashioned to precise size, and then fitted to other planks not by glue or nails, but are ‘sewn’: joined with cord made out of coconut fibre. These joins are caulked with resin from the breadfruit tree, and these careful and difficult techniques produced very robust vessels. As Geoff Irwin has pointed out, far from making the vessels weak or flimsy—as many Papalagi expected—these joins could often prove hardier than nails or more rigid construction. The ability of joints, particularly between hulls or outriggers and hulls, to move and flex made them less likely to break at sea. Any separations an able navigator could repair, and would not necessarily prove any great hardship at sea.

The third kind of vessel, also plank built, and the largest commonly used by Samoans was the 'alia, the catamaran. These could reach a considerable size, and the largest documented were well over 100 feet long, and clearly capable of carrying dozens of people comfortably. [See figure 1: a postcard of an 'alia, ca.1900]. The two hulls were asymmetric, with one named and treated as an ‘outrigger hull’. Across the platform spanning the two hulls was there was a house, and this was indicative of the carrying capacity and range of the vessels. Though the use of 'alia declined severely over the

27 Also known as a tafaga, Churchill, Samoa 'Uma, 94.
course of the nineteenth century, there were enough examples that they were well
documented and even photographed. At any rate, the size and cost of the vessels meant
that they were never particularly common, and the political entities that commanded
fleets of them—notably the small but politically important island of Manono—remain
famous to this day. The trade-off for the ’alia was that they were not as nimble or as
easy to handle as va’alo or ’iatolima, and those of the middling size (around 50-70 feet)
were probably optimal for voyaging, with the larger ones being more appropriate for
transport or war. While all other Samoan vessels tacked in a manner not unlike modern
sailing vessels, the ’alia was ‘shunted’. This means the ’alia had no permanent bow and
stern, and the tack was accomplished not by the boat coming about in the wind, but by
reorienting the base of the mast to the other end of the craft, and reversing the direction of
the ship. This also served the important function of keeping the ‘outrigger’ hull on the
weather side, as the stern became the bow—though both were identical.

The ‘shunting’ of ’alia is one of the more dramatic signals that the way Samoans
(and Polynesians more generally) put to sea were different from the ways of Papalagi.
Samoan ships were without deep keels, which enabled vessels to negotiate reefs and be
easily beached; they did not have rudders, but were handled with steering paddles,
foemuli. Any number of other design or practical differences could be mentioned, but
even these were not as important as differences in the sea ‘cultures’ between Samoans
and Papalagi. Perhaps most dramatically of all, Samoans who went to sea expected to
get wet, and would not panic if they went into the water. This was quite the opposite of
western seamen, who were uncomfortable in the water. Indeed, the greatest western
navigator in the Pacific, James Cook, could not even swim (it might have saved his life in
Hawai’i had he been able to), nor could most of his crewmates. Not just religious,
cultural, or social behaviors were different at sea, but economic and survival measures as
well. Fishing and the collection of rainwater from sails, for instance, core activities on
long Polynesian passages, were only undertaken by Papalagi in extraordinary times.
Ways of looking at the sea, of living upon it, of negotiating and understanding it, were
fundamentally different.

The design and operation of these vessels, like navigational knowledge, was
constantly being reworked, added to, and otherwise changed. One such significant
change had happened just prior to the arrival of Papalagi, when the va’atele, a catamaran of Samoan design (much like those in eastern Polynesia), had given way to ‘alia, a design which came from Tonga, possibly originating in Micronesia. The nineteenth-century decline of the ‘alia is another demonstration of this. This decline began shortly after mid-century, when a preference for a new kind of Samoan vessel developed. This was the taumualua, which was modeled on the whaleboat and designed to operate as a platform for musketry, and was later even armed with swivel guns and other light artillery. Looking like long whaleboats (sometimes over 100 feet long) these were first designed by an American, Eli Jennings, in response to the domination of local seaways by fleets of ‘alia in times of war.\textsuperscript{28} The taumualua gave its occupants better cover, and was used solely for travel within and around the Samoan islands. Though seaworthy there are no suggestions they ever went abroad. Interestingly, some taumualua were clinker built, with nails and western-style construction, while many others continued to be ‘sewn’, using Samoan expertise and techniques.

Samoan seacraft documented not only culture, technology, knowledge, and purpose, but were economic intersections, calling upon economic activity as diverse as the incantations of religious experts, to the weaving of sails, and the production and preservation of food. Yet the most expansive economic activity centered on the large canoes themselves. These were often built outside of Samoa, especially in Fiji. In some respects this is not surprising. Fiji has much larger islands, larger rainforests, and consequently a greater supply of the timber needed to build these immense boats. In this sense the canoes were both the means and the purpose of travel. The expertise of the Fijian boatbuilders was a cornerstone of the Samoa-Tonga-Fiji nexus, as was Samoan expertise in the production of extremely fine woven cloth (’ie Toga/kie Ha’amo’a), and particularly, tattooing—a vital aspect of Polynesian life. Tongans were famed for their medical skills, and most relevantly here, as navigators. Indeed, one source suggests most Samoan long-distance voyages took with them a Tongan navigator. These economic, technological and cultural connections ensured that navigation remained relevant and practiced.

\textsuperscript{28} The Samoa Reporter, no.13, July 1851 (an in house missionary newspaper).
The very close connections between Tongan navigators and navigational knowledge and that of Samoa needs to be emphasized. Most of the voyages between for which there is reliable evidence has an important Tongan connection. The concentration of navigational knowledge in Tonga into certain lineages, notably Akau’ola and Tuita, and a greater amount of detail that is possessed about this knowledge means this is an important conjuncture for learning about Samoan navigation. Through their established use in Tonga we can be sure that techniques such as ‘expanding the target’, the reading of seamarks, the use of swells and winds for directionality, as well as some system of orientation at sea—techniques which are seen as basic to Pacific Island navigation—were likely known to some degree in Samoa. This conjuncture, however, also invested the political economy that joined Samoa and Tonga with heightened ramifications for certain knowledges. The tautai of Samoa, and the toutai of Tonga were entangled.

The discontinuation of either building ‘alia locally or importing them from Fiji was consequently both a cause and an effect the decline of long distance voyaging and navigation. Most commentators who note the decline of ‘alia either assume its decline was inevitable, or suggest it was due to the failure of technology or knowledge: its being surpassed by western technologies or developments. Typical of these commentators was Llewella Churchill, who wrote that ‘the alia was not easy to build, its bulk was too great for many passages in the reefs, its draft was disproportionately great, and it could not stand comparison with foreign boats of an equal passenger capacity.’ No doubt some of this was true; ‘alia were difficult to build, and they were not easy to handle (which hundred footers are?); but the broad draft of the vessels gave them good speed at sea, and the ways in which they fared poorly in comparison with ‘foreign boats’ depended only on the grounds of comparison. But the key point of comparison in this period was the ability of ‘alia to operate as platforms for musketry and light artillery, an entirely new design function, one relevant only since the 1820s. ‘Alia could clearly outperform the vessels

29 Lewis, We, the Navigators, 37, 148-50, 56-7, passim.
30 Finney, "Rediscovering Polynesian Navigation through Experimental Voyaging."
31 Churchill, Samoa 'Uma, 91.
that replaced them in offshore voyaging, but this had become less important than a particular kind of military effectiveness. This was dramatized in a drastic reversal of the seemingly indomitable Manono fleet of 'alia in the 1851 war. Over the next couple of decades the newer designs, such as the taumualua, or other ‘foreign’ vessels, also came to symbolize wealth, status, prestige and power in the manner that 'alia formerly had. Yet these vessels were primarily acquired to travel within Samoan waters. Consequently the decline of 'alia stemmed not from their inferiority as seagoing vessels, but from shifts in the uses of seacraft and in the symbolic economy of Samoa.

The decline of 'alia was led and resulted from the narrowing of Samoan involvement in the wider region. This was largely (but not solely) precipitated by the civil wars that plagued Samoa after 1850. These wars were fought by Samoan alliances in a Samoa destabilized by the interventions of Papalagi—particularly the intense rivalry between Germany, the U.S. and Britain, the establishment of Christianity, and new commercial and economic formations. These processes had a primary effect in constricting and constraining Samoan ambitions and involvement further afield. This was not a natural or uniform reaction to colonialism or imperialism: in Hawai‘i, and especially in Tonga, the period of initial imperialism was one in which indigenous politics expanded: in Hawai‘i Kamehameha extended his mana over the entire Hawaiian archipelago, and in Tonga Taufa‘ahau Tupou I (King George) established rule over the entire Tongan archipelago, and even the island that lay on the passage between Tonga and Samoa, Niuatoputapu.

Tonga under Taufa‘ahau is an important case. For not only did he consolidate rule over Tonga, he expanded his rule into neighboring Fiji. By the 1860s his governor of eastern Fiji, Henele Ma’afu, had through force of personality, arms, and diplomacy become the most important political figure not only in the eastern area of Lau, where he

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32 The Samoa Reporter, no.13, July 1851 (an in house missionary newspaper).
33 For a summary of this complicated period see Malama Meleisea, The Making of Modern Samoa: Traditional Authority and Colonial Administration in the History of Western Samoa ([Suva, Fiji]: Institute of Pacific Studies, University of the South Pacific, 1987), ch.2.

Damon Salesa. University of Michigan (not for citation). 16
formally claimed authority, but throughout Fiji.\footnote{Deryck Scarr, "Cakobau and Ma'afu: Contenders for Pre-Eminence in Fiji," in \textit{Pacific Island Portraits}, ed. James W. Davidson and Deryck Scarr (Canberra: Australian National University, 1970).} In some respects this seemed to be a revival of the Tongan imperialism that is remembered throughout Samoa and Tonga, and certainly Tongans were famed for their wide-ranging political involvements, which at times may have spanned over 1000 miles in some directions. The relationships and history between Tonga and Samoa are intimate, but fraught—an animosity is occasionally apparent even today. Yet for nearly 30 years after the English Wesleyan mission decided to abandon Samoa as part of a gentlemen’s agreement with another mission organization in 1837, Tonga sustained Methodism in Samoa. In 1847 Taufa’ahau himself visited, bring a fleet of \textit{kalia} (almost identical vessels to \textit{'alia}). This sight was sufficient to impress the Bishop of New Zealand, George Selwyn, himself an accomplished seaman. Selwyn sketched the fleet, and was impressed with their ‘enormous size; often not less than 80 feet long, and will care more than 100 persons.’\footnote{Selwyn to his father, undated, Selwyn family papers, MS-Papers-7188-04, Alexander Turnbull Library, New Zealand.} (See figure 2: Selwyn’s sketch of the Tongan fleet at anchor).

Evidently Polynesian navigation held together the Fijian-Tonga-Samoa nexus until mid-century, though in the next quarter-century only Samoa became disconnected. However, as Fiji was annexed by Britain in 1874, and Tonga struggled (ultimately
successfully) to avoid coming under direct imperial control, the voyaging spheres throughout the region began drastically to contract. Oral and archaeological evidence suggests these kinds of fluctuations in voyaging were common, that some periods saw much more or less voyaging. After Samoa expelled Tongan invaders prior to the arrival of *Papalagi*, for instance, it was comparatively isolated from the neighboring archipelagoes. Such fluctuations were also evident in European seafaring in Pacific—having first entered the Pacific in 1521, Europeans’ voyages seemed to come in spurts for the next 250 years. But this contraction in the last quarter of the nineteenth century signaled a particular kind of change, in qualitative and not only quantitative terms. Although Fijians and Polynesians proved in the twentieth century to be amongst the more mobile of peoples, resettling in proportionately huge numbers throughout the Pacific rim, the days of autonomous voyaging and navigation had effectively come to a halt by 1900: by and large both the technology and the knowledge became less and less used. Within a very short period after the arrival of *Papalagi* a great voyaging that extended thousands of years and miles had, in many respects, ended.

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The different processes which occasioned the ‘narrowing’ of the Samoan voyaging world enabled the decline of navigation and voyaging. This was not due to deliberate attempts by colonial or imperial regimes, for these came after 1900, when the ‘decline’ was already well underway. Most strikingly, this ‘decline’ was not because Samoan or Polynesian voyaging had been transformed or supplanted by a more effective or somehow more appropriate navigational practice or knowledge. Though hundreds of Samoans began boarding western ships to work in the nineteenth century, none turned to building schooners and using sextants. Such developments would be easy to explain within conventional narratives of the displacement or transformation of colonized peoples. In less than a hundred years Samoans moved away from an advanced technology and a highly developed knowledge. Why was it that they ‘forgot the way’?

It was not simply through neglect or as a result of dependency on oral texts that Samoan navigational knowledge largely disappeared. This is a common explanation, favored by some *Papalagi* observers for any number of ‘lost’ indigenous knowledges. In
part this is motivated by assumptions that non-literate cultures had only transient and speculative forms of knowledge. But such assumptions do not explain why some knowledges persisted (such as tattooing, esoteric historical discourse, for example), and others did not (navigation), or why some adapted (medical belief and practice) and others remained textually close to their pre-Christian origins (Samoa’s ‘ancient constitutions’ or fa’alupega). In order to explore this question further, and comparatively, it is worth considering some of the features and politics of the Samoan knowledge ‘economy’.

Throughout the nineteenth century all of the most specialized, valuable knowledges were kept by certain groups or lineages, jealously guarded and highly valued. This appears to be true also for navigational knowledge. Only the most prosaic knowledge was open, as there were strict protocols concerning the sharing or exchange of more specialized ones. As with technoscience, particular sets of knowledge ensured influence for their owners, and consequently the archiving and control of information was rigorously monitored. Certain people either within families or lineages, or within districts, were charged with this onerous task. Missionaries were immediately impressed with the ‘wonderful power’ of the living archives. One such Samoan man, Sepetaio, ‘who was blind, had not only a perfect knowledge of his national records but a wonderful memory for other things. After the introduction of Christianity and the dissemination of Christian literature, by simply listening to the reading of others … he could repeat correctly large portions of Scripture, and quote texts chapter and verse, with great ease and correctness … he knew perfectly all those portions of Holy Scripture which at that time had been translated into Samoan. … [F]rom the constant exercise of their memories numbers of the Samoans possessed what by us would be considered phenomenal memories.’

Samoan knowledge was restricted, tightly organized and well monitored. It was consciously politicized, and this often adversarial environment, and the great emphasis Samoans placed on the verification and testing of knowledge served also to foster the accurate retention of the oral archive. Nineteenth-century Samoan society placed great

37 Stair, Old Samoa, 290-1.
import on challenge, debate, and disagreement, and although knowledge was acquired and maintained in private, the select moments of public rehearsal were critical events.\(^{38}\)

The politics of the transmission of knowledge, and the instruction of students, was a similarly careful. In his work on Pukapuka, an island to the east of Samoa (and in many respects closely related), Robert Borofsky has made observations germane to Samoa. He has described how instruction was conducted in very different modes to western techniques: relying on observation, imitation, listening and repetition, a process presided over by an expert. It was rare that a number of codified principles or an abstract body of knowledge was taught in the formal sense implied by ‘education’.\(^{39}\) In Samoa even disciplines as technically demanding and unforgiving as tattooing required much of the learning by an apprentice to be done through observation and listening. Indeed, the foremost place of instruction in matters of oratory and history is outside the meeting-house of the village council (as Samoan houses have blinds, rather than walls, listening is easily done). At all times of learning weight was placed on listening ‘properly’, and asking the same question twice implied a failure on the part of the listener.\(^{40}\) Consequently, the moments when knowledge was performed or articulated publicly were especially important; people who aspired to possess or understand this knowledge had to process it quickly—a feature that is still relevant today, even in contemporary, highly literate, Samoa.

The criticisms of the accuracy and verifiability of oral texts, commonly rehearsed by Papalagi, make little sense in these contexts, and are more revealing of Papalagi subjectivities. Common Samoan criticisms of books are equally revealing. These assert that books contain only a single, biased—or at least situated, viewpoint, and that there is no critical way of ascertaining the competence, capability or character of this individual viewpoint on other than its own terms—books cannot join in conversation, they cannot be interrogated, they cannot adjust themselves to the appropriate place or mode of their performance. If there was intense, perhaps almost interminable debate around certain


\(^{40}\) Ibid., 74-130.
knowledges, this was not so much that there were no systems of validation, no agreed on ‘regime of truth’, but rather that no-one, and no knowledge, was held to exist outside of contexts that comprise this. As Bradd Shore has put it, Samoans do not consider that there ‘is a privileged moral viewpoint outside any social context.’\(^41\) Samoans regarded knowledge as situated, not only in the individual, but in that individuals’ village, status, relations, gender and experience. If anything the Samoan approach to the orality of knowledge was much less acritical than hypercritical.

Expectations that the limitation of knowledge to small constituencies may have predisposed them to disappearing or being forgotten are also contradicted in Samoa. Having a particular lineage, family, village or district possess a certain knowledge was simply a way of reserving it, but also of preserving it. By a family accepting responsibility for a certain knowledge, for instance, they were not only keeping it as their own, but treasuring it, and ensuring it would be passed on. The possibilities of nobody remembering rigorously what everybody knew and anybody might have remembered were evident: ownership of certain knowledges did ensure their preservation, and often the knowledge with the fewest practitioners were the most robust. In Hawai’i, the family charged with the knowledge of the sacred hula of Pele, their ancestor, still perform those hula, as they have for hundreds of years. In Samoa, the pre-eminent family of tattooists continue their craft, as they have also for hundreds of years, perhaps even longer.

Interestingly, the key period of navigational decline was also the period of developing mass literacy in Samoa and Polynesia, and this conjuncture gives rise to important questions. Samoans encountered the new technology of writing with tremendous excitement, yet nonetheless even-handedly. As the first white missionary in Samoa noted, Samoans could see the uses of writing, but were not immediately overawed with its potential. One chief, having admired writing, went on to say ‘he thought that the Samoans were even more clever in this respect for they retained such things in their heads without the use of writing.’\(^42\) Certainly it was apparent that writing had its drawbacks. One quality that Samoans observed was deeply problematic was the

\(^{41}\) Bradd Shore, Sala’ilua, a Samoan Mystery (New York: Columbia University Press, 1982), 191.

profligacy of writing. The written word is, by Samoan standards, a wanton artifact, difficult to discipline or mediate. It is not a medium to be easily trusted with the most important knowledge, for it could fall into the wrong hands; even today, if such knowledge is written down, access to the pages is incredibly tightly and rigorously controlled.

Yet within two or three of decades of the development of a written form for Samoan and the beginnings of Biblical translation (1835), the majority of Samoans were literate. The effects of literacy within Polynesia, however, remain widely debated. An earlier school of thought considered literacy to be an undermining force, one that had negative effects on Polynesian life and thought, one that opened these societies to new kinds of (generally insidious) influences. Others saw literacy within histories of continuity, and others still have suggested histories of creative encounter. The impact of literacy is a vital concern, but one too large to fully explore here. What is more immediately important in terms of navigational knowledge is the texture and institutionalization of literacy. The promulgation of missionary schools, which were centered on the processes of Christianity and the Word, had tremendous impact. These schools were based on new pedagogies and mediums of instruction, and taught children of different regions, histories and status in uniform ways. The dispersed and democratic nature of missionary education—more than even the content of its teaching—was radically different in Samoa. If schools had replaced other formal structures of learning their impact might have been easier to contain; as it was, however, the distancing of Samoan children from other contexts of learning, the informal situations in which

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44 This summary of Samoan missionary schools stems from the archive of the dominant missionary society, the London Missionary Society (*Lotu Taiti*): LMS-SSL&J, Boxes 1-10, SOAS.
Samoan learning had hitherto taken place, meant certain knowledges were likely to have difficulty in finding space and time, in a new economy of time and space, to be learnt.

If there had been in Samoa formal schools of navigation, such as has been observed elsewhere in the Pacific, and which still operate today in Micronesia, or if there had been certain lineages who were proprietors of navigational knowledge, Samoa’s nineteenth-century navigational histories would be different. What kind of difference is only speculation. Such navigational schools were never noticed in Samoa, and there is no oral evidence, as far as I am aware, that they existed. There existence was certainly no permanent fix. On Puluwat aspiring navigators attend formal navigation schools in order to learn—yet the (comparatively recent) arrival of western schools has limited their clientele and social ‘space’. In Tonga navigation was dominated by families such as Akau’ola and Tuita, the kaivai, or ‘water-eaters’, and these families retain a significant amount of this knowledge even today, over a century after the last voyages and navigations—but the voyaging and navigation still stopped. Nonetheless, it is evident that the way knowledge was learnt and known, as well as the ways in which it were practiced shaped its histories. Finally, I want also to suggest that there were certain qualities of knowledge that may have played similar roles too.

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Richard Feinberg’s recent research on the Polynesian island of Anuta, where active instrument-less voyaging continues, is instructive. In 1983 he had islanders draw what are now called ‘wind compasses’. These name directions like a magnetic compass based on the names of different winds. Between two different ‘compasses’ drawn by Anutans many of the directions stayed the same, but others seemed radically different: Tuauru shifted from NE to south, and Tonga Maaro from NNE to SE. Yet, in a revealing moment, the men who corrected the first map reflected that it ‘was perfectly correct; [the person who drew it] had just placed the points too close together!’ As Feinberg noted: ‘Pu Maevatau, who has sailed successfully to Patutaka on thirty-eight occasions and who can cite star paths to Tikopia, Vanikoro, Taumoko, ‘Uvea, and Rotuma, obviously knows what he is doing on the ocean. Yet, if one were to follow his
direction based on the bearings shown on his map, one would become quickly and irretrievably lost. … [there is a] relativity that permeates the Anutan world view.”

Feinberg sees this inability to accurately and absolutely fix what Anutans sense of direction also as a function of Polynesian languages, which do not have superlative forms, with all forms remaining fundamentally comparative. This relativity, I would like to suggest, was a fundamental quality of Polynesian navigation.

Let us turn to another Polynesian setting, several thousand of miles away, and a hundred and fifty years earlier. The English missionary John Williams, one of the most sensitive ethnographers of his time, allowed a young man from Atiu (in the modern day Cook Islands) to navigate his vessel. He was at first uncertain of the man’s competence, for his instructions were confusing: ‘when we inquired of him the position in which it lay, he at one time pointed in one direction, and another in quite the opposite.’ Later on these instructions came to make sense, at least in the most important way, for Williams and crew made land. As John Williams advised his readers, ‘I think it be of universal importance to all persons, in every scientific or other expedition, who seek information from natives, as it shows the correctness of their knowledge; but they must be allowed to communicate it in their own particular way.’

This point, made pleadingly by a missionary in 1837 has taken some time to be appreciated by a broader western audience, not least amongst scientists (for whom the same comment might be held equally to apply).

Another dramatization of these issues is Tupaia’s map. Tupaia was the navigator-priest who James Cook (at the behest of Joseph Banks) took onboard at Tahiti in 1768. As a Polynesian intellectual he was very active in studying and learning about the English, and quickly began to practice and interrogate their knowledge and customs: he began painting, learning English, and further, was the chief mediator/translator with other Polynesians that Cook came upon, particularly in New Zealand, where many Maori held


him to be in charge, and called the *Endeavour* ‘Tup[a]ia’s Ship’. Likewise Cook and his crew studied Tupaia, his ways and knowledge: early on Cook got him to direct the drawing a map of Tahiti and the surrounding seas. Tupaia charted 74 islands on a map that has attracted and confused scholars since. [See figure 3] The difficulties in translation and spelling make it difficult to assess which places Tupaia specified.\(^47\) Tupaia himself navigated the *Endeavour* to Rurutu, 300 miles south of Tahiti. Though most of his own personal voyages had been within this radius of Tahiti, he made made a journey further afield to ‘Manua’. Was this Manua the island of Manuae in the Cook Islands, or the islands of Manu’a in Samoa (furtherest, at 1200+ nautical miles)? Historians and navigators remain unsure, and Lewis has gone as far to suggest that ‘the only indisputable fact [was] that [Manua] was not where Tupaia said it was.’\(^48\)

Yet Tupaia had been to ‘Manua’, and there is little reason to doubt that he could have gotten there again—in short, he knew where it was. Given Cook’s willingness to let him navigate the *Endeavour*, and his confidence that Tahitians could voyage beyond 200-300 leagues (over 900 nautical miles) this hardly seems unreasonable. If Lewis suggests that Tupaia misplaced an island, he means that Tupaia charted it wrongly. But the map, as they say, is not the territory. This seems to me an issue related to the wandering wind compass points in Anuta, and to the kinds of pointing that confused Williams. As both Cook and Williams (like Feinberg) found, their navigators had no difficulty in navigating (Tupaia always knew where Tahiti was, even when in new waters), only in communicating *how* they navigated to western observers, or in ‘charting’ their knowledge. These were problems of culture and comparison, problems of *translating* Polynesian knowledge about navigation into western knowledge, and vice versa. This is not to imply that either system of knowledge was untranslatable: clearly at a functional level it was possible for mariners using one system to learn from another. We can only speculate what Tupaia thought of Cook’s maps, but we can be sure that he had made a

\(^47\) A process compounded by the input of Cook and his crew himself. Horatio Hale, who visited Tahiti with the U.S. Exploring Expedition, pointed out that the islands the English had already been to they placed ‘accurately’, a process which hybridized the map and might have distorted any ‘projection’ or scale Tupaia might have developed: Horatio Hale, *Ethnography and Philology* (Ridgewood, N.J.: Gregg Press, 1968), 123.

\(^48\) Lewis, *We, the Navigators*, 296.
sense of them, and understood their centrality to his navigations. What did he make of
their knowledge?

Figure 3: Tupaia’s Map, as drawn by Forster, from Lewthwaite.

The point was rather, to recall the phrase of Williams, that Polynesians ‘must be
allowed to communicate it in their own particular way’—that what was known, the way it
was known, and the way it could be communicated were interconnected. I think that this
was evident in the inability of Kramer to learn the methods of navigation which were
being explained to him, and that this difference—the disconnect, untranslatability or
incommensurability was to have considerable import in the history of Samoan navigation.

To explore this notion further I want to discuss a related Pacific Island (though non-
Polynesian) example, the very widely studied system of ‘etak’. Etak is a navigational
concept that in sailing from one island to another uses a third, unsighted ‘reference’
island (etak) to navigate. In the most simple terms, and its most simple use, the
navigator, knowing ‘under which star’ the etak lies when visualized from the endpoints
and various points along the voyage, understands the voyage progressing by the island
moving from one star point to the next.

‘This is the essence of the concept—that one etak along the the course corresponds
to the apparent ‘movement’ backwards by one star point of the reference island. …
In other words, the canoe is conceived as stationary beneath the star points, whose
position is also regarded as fixed. The sea flows past and the island astern recedes
while the destination comes nearer and the reference island moves “back” beneath
the navigating stars.’

The islands were moving, and the vessel stayed still. This was a conception that
Carolinian navigators knew was not literally true, but which was key to this fundamental
system, a system that has proven more difficult than even it at first seems. As Gladwin,
who like Lewis and Ward Goodenough has written extensively on etak, puts it, etak
integrates knowledge about rate, time, geography and astronomy, and expresses it as a
form of ‘distance travelled’. Or does it?

Lewis’s experiences in researching etak are very relevant here. Working with the
navigator Hipour of Puluwat in the Caroline Islands, a master navigator who had ranged
over 480 miles from his home island, and his student Beiong, he was exploring the uses
of etak in ways pioneered by the scholar-sailors Goodenough and Gladwin. During the
course of instruction Lewis tried to figure out the identity of an etak island known as
Ngatik. The following passage should be quoted at length:

[Ngatik] had not been visited by Central Carolinian canoes for several generations
but was an etak reference island for the Oroluk-Ponape voyage and as such its star
bearings from both these islands were known to Hipour. On his telling me what
they were I drew a diagram to illustrate that Ngatik must necessarily lie where these
etak bearings intersected. … Hipour could not grasp this idea at all. His concept is
the wholly dynamic one of moving islands, and possibly this is why he several

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49 Ibid., 134.
50 Gladwin, East Is a Big Bird, 186.
times asked me how islands got on charts. I think he can visualize islands as static when thought of from the start or end points of a voyage, provided there is no tacking and the course between is a straight line: but [not] … when they are conceived of as fulfilling their etak function.

Hippour’s younger student, Beiong, had the same difficulties, but managed to verify the diagram by ‘the mental tour de force’ of ‘visualizing himself sailing simultaneously from Oroluk to Ponape and from Ponape to Oroluk and picturing the etak bearings to Ngatik at the start of both voyages.’ (143). Quite rightly, and quite clearly, these encounters demonstrate the unlikelihood of Puluwat navigation having been ‘corrupted’ by knowledge gleaned from western maps or navigators. But for the purposes here they offer a detailed demonstration of the incompatibilities of these two navigation knowledge traditions. Moreover, if islanders learned in one tradition have trouble comprehending the other, what about the reverse, non-island navigators approaching island navigation?

These are differences not easily overcome. Two scholars, Edwin Hutchins and David Turnbull, have argued that Pacific Island navigation, (not least etak), should be seen as a different process fundamentally different to navigation. They argue that it is about orientation, not one of calculation (as with western navigation). There has been an underlying assumption by Papalagi (and Pacific Islanders not learned in the knowledge of indigenous navigation), that Pacific Island techniques because they were effective must in some way or other be equivalent to western techniques. ‘Western analysts have worked backwards from what they take to be the fundamentals of chart based dead reckoning and assumed that these fundamentals must have their equivalents in the Pacific systems.’

This has led scholars to interpret Pacific Island navigation through the ground of supposed western equivalents: thus, etak has been seen as a Pacific Island way of dead reckoning. What happens if one attempts to understand it on its own terms? An interesting attempt at doing precisely this has been made by Edwin Hutchins. He has put this contrast nicely:

The tool box of the Western navigator contains scales and compass roses on charts, dividers, sextants and chronometers. These are all A/D and D/A converters. In our

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tradition, the operations of observation, computation, and interpretation are each a different sort of activity and they are executed serially. The Micronesian navigator’s tool box is his mind. There are no A/D or D/A converters because all the computations are analog. The interpretation of the result (bearing of the reference island for example) is embedded in the computation (construction of the horizon image) which itself is embedded in the observation (time of day).

This view, contrary to the orthodox, argues that Pacific Island navigation is based on what Turnbull calls ‘a dynamic spatial organisation of knowledge’, or in another formation of Hutchins, a ‘logical construct or cognitive map’. It makes plain the radically alternative of systems of navigation, such as the Pacific Island ones, without ‘consistent units of measurement’ — something impractical and perhaps unimaginable within western systems of navigation. Both Hutchins and Turnbull also take this reformulation as a critique of earlier depictions which saw Pacific navigation as a ‘closed’ one (opposed of course to the openness of western technoscience). The practical critique of this claim was, in any event, the ability of the Carolinian navigator Mau Piailug to adapt his system of navigation to navigate the Hokule’a over 2,000 miles from Hawai’i to Tahiti — in waters he had never seen or learnt about.

There is no firm evidence that a system such as etak was in use in Polynesia, and there is no need to argue that there at one time was. Nonetheless, in a provocative reading of one of the few detailed and informed narratives of early contact Polynesia, Lewis has argued that some way of making complex chains of voyages was clearly in use in Tonga, though we do not know what. That such accounts offer little to go on should hardly seem surprising, for a half century of research was necessary before etak was well understood by observers, and some would suggest that it still isn’t.

Evidently the problems of translating this kind of knowledge into western languages and conventions are considerable, as they involve much more than simply

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54 Ibid., 205.
55 Lewis, *We, the Navigators*, 148-9, William Mariner and John Martin, *An Account of the Natives of the Tonga Islands, in the South Pacific Ocean*, 3d ed. (Edinburgh.: Printed for Constable and co.; [etc. etc.], 1827), vol.1, 316-17.
finding an appropriate term, but dealing with different processes of thinking, observation, interpretation and action. Yet the politics and processes of translation are crucial. Most of the Micronesians with whom researchers worked in the last half of the twentieth century, and virtually all of the Polynesian navigators who were the informants for eighteenth- and nineteenth-century accounts, spoke different languages each other. Where the ethnographer/scholar was fluent in the local language, he or she was rarely sufficiently competent in navigation, astronomy or the other relevant western sciences to engage with their informants in intellectually robust ways (as in Kramer’s case). The acuteness of this difficulty is especially pronounced because of the way navigation called indigenous languages into very particular, and perhaps unique, uses.

The language of navigation in Samoan (about which comparatively little navigational language is known) is indicative of this. It is filled with allusions to Samoan history, to originary stories, and so forth. To study the pre-Christian Samoan calendar, for instance, is to have a primer on the movements of the moon at the same time as revisiting Samoan histories and studying the appearance of the palolo, small worm-like fish (a Samoan delicacy) that appear only at certain times of the year. As Bruce Biggs has put it, Polynesians constructed ‘knowledge as allegory’. To this I hasten to add, as has been shown above, it was not solely allegorical, however important and instructive this dimension of knowledge was. Knowledge had both literal and figurative components, and the ability to navigate between these was (and is) an essential process for those who would learn or possess such knowledge. The metaphorical nature of Polynesian navigational knowledge was not unique, of course. Any number of studies have shown how the languages and narratives of western science are also metaphorical. The intensely allegorical and allusive nature of the Samoan language—the richness of its metaphors—which has attracted the attention of many linguistic scholars, is a measure of

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how interrelated different knowledges were.\textsuperscript{58} This is true of other Pacific Island navigational systems, and it is in the context of metaphors, then, that I interpret the description of \textit{etak} as ‘moving islands’, a statement that is paradoxically literal and figurative, true and false.

From such a point of entry many other forays eventuate. For instance in Samoa navigation is closely connected to the ‘spiritual’ or supernatural. The supernatural and the natural were not starkly divided in Samoa or in Polynesia (or amongst the early English missionaries for that matter). In Samoa various classes of ‘spirits’ could be found walking or sailing upon the earth, and could be threatened, cajoled, seduced and so on. Indeed, the graduated path between the divine and the mundane troubled the language of Christian conversion, with missionaries eventually settling upon a category of spiritual beings to use as the word for the Christian God (\textit{Atua}—meaning, beforehand, those who dwelled in Pulotu—a spiritual underworld to the west of Samoa).\textsuperscript{59} Certainly the earthly was only known in Samoan by contradistinction to the heavens or horizons, of which pre-Christian Samoans considered there to be many (\textit{lagi}—heavens vs. \textit{lalolagi}—under the heavens, i.e. earth) The language of the spiritual had important navigational or maritime metaphors, and death was assumed to precede a final voyage, to an offshore destination or one beneath the seas and lands. Navigation, not least because of its celestial dimensions, was a way of crossing the boundaries between \textit{lagi} and other dimensions. Equally, the interlocutor of the supernatural was the ‘anchor of the spirits’ (\textit{taulaaitu}), and the observant navigator or fisherman, the \textit{tautai}, would be careful of his correct behavior to the appropriate gods, spirits, and ancestors.

The kinds of nuance and technicalities that recent researchers have been able to explore are, it is to be suspected, only the beginnings of further research. As the provocative work of Hutchins and Turnbull have shown, even in contemporary work the means by which Pacific navigation is being archived remain structured by the terms of


\textsuperscript{59} E.g. Stair, \textit{Old Samoa}, 211.
investigation, which in turn are constrained and guided by western science and scholarship. These impulses have changed dramatically from those guiding the work undertaken during earlier periods, and thus have enabled new understandings. In particular, the self-questioning and self-reflection concerning the projects of technoscience, and above all the willingness of recent work to not treat it with a privilege denied to other traditions of knowledge has been especially rewarding.

The thoroughly different approach to navigation means questions stemming from western understandings of navigation can be restrictive and misleading. I was once in conversation about the legendary Tongan voyager, David Fifita—whose crew was shipwrecked on Minerva Reef, and whom he managed to keep alive and eventually see home safely to Tonga—with a Tongan friend. He was full of stories of awe and wonder about the abilities of the Tongan seaman, and told me with utter conviction that Fifita could simply put his finger in the water and know where he was. Not long after this, I was talking with David Lewis, and told this story, not so much to illustrate Fifita’s navigational ability, but the reputation he still commanded. Lewis quickly disinvested me of this; explaining that Tongan navigators did not have a single name for the surrounding waters, as did ordinary Tongans, but had names for certain regions or seas, and that these could sometimes be distinguished by sealife, salinity, and often, by temperature. The able navigator could discern temperature differences between different seas, which often were significant. Under few models of western navigation would the taking of temperature be seen as anything other than bizarre. Similarly the identification of ‘seamarks’, a staple of Pacific Island navigation, that as far as myself or the literature is aware, has no western equivalent.

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In this paper I have contextualized Samoan navigational knowledge in three ways in order to cast the relevant historical processes into various reliefs. The main contexts I have used to investigate some of the histories of Samoan navigation—its practices and the narrowing of Samoan horizons, the transmission of navigational knowledge and knowledge more broadly, and the quality or intellectual content and processes of the
knowledge—intimates that any explanation for how Samoans ‘forgot the way’ must be complex.

Along the way I have suggested that the differences in navigational knowledges between Samoan/Polynesian and ‘western’ ones, were central to the histories of navigation itself. By this I mean that these differences, played out in at least two ways. In one respect it was an incompatibility: that because Samoans thought about the sea and navigation in a way that could not be reconciled with the way that westerners did, they could not appropriate or adjunct navigational knowledge in a way that was possible with many other forms of knowledge that were encountered. Accurately or not, this was the process that was used with regard to religious knowledge, knowledge of construction or the making of objects, or tattooing, for instance. Sure, as in the case of tattooing, its common conception as ‘bodily adornment’ was restrictive, but it opened up the wider analytic possibilities that followed. In another respect these differences and incompatibilities rendered navigational knowledge ‘illegible’ to westerners. Even at the moments with which they were most concerned with it, they were unable to write it down. This meant that the archives that were assembled could find little presence for navigation, except in a few cases, such as when it was logically or narratively necessary. This, as well as the contexts suggested above, did important historical work in shaping how Samoans forgot the way. It seems that this was at least partially related to the apparent lack of interest or will to engage in operations of comparing knowledge, at least as far as navigation was concerned.

As a number of scholars such as Anne Stoler, Nicholas Thomas, Fred Cooper and Benedict Anderson have suggested, colonialisms and imperialisms had a certain ‘modular’ quality. As a result they were invested in comparative work of their own, constituting and interpreting empires by trying to render elements comparable, transferable, analogous. Certain comparative projects—such as religion, material culture, political systems, for instance—were privileged within such operations or discourses. Others, and I would put Pacific navigation in this light, were resistant to these kinds of comparisons. At least partially this was because comparisons struggled with unusual kinds or formations of knowledge, but there are other possibilities besides.
Perhaps more urgently, seeing these processes at work historically raises parallel questions about why we are interested in making different kinds of comparisons now. What work is such comparison aiming to accomplish? In what ways, to stretch the analogy, have the processes by which indigenous people lost their way(s) helped their (post)-colonizers find theirs …

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