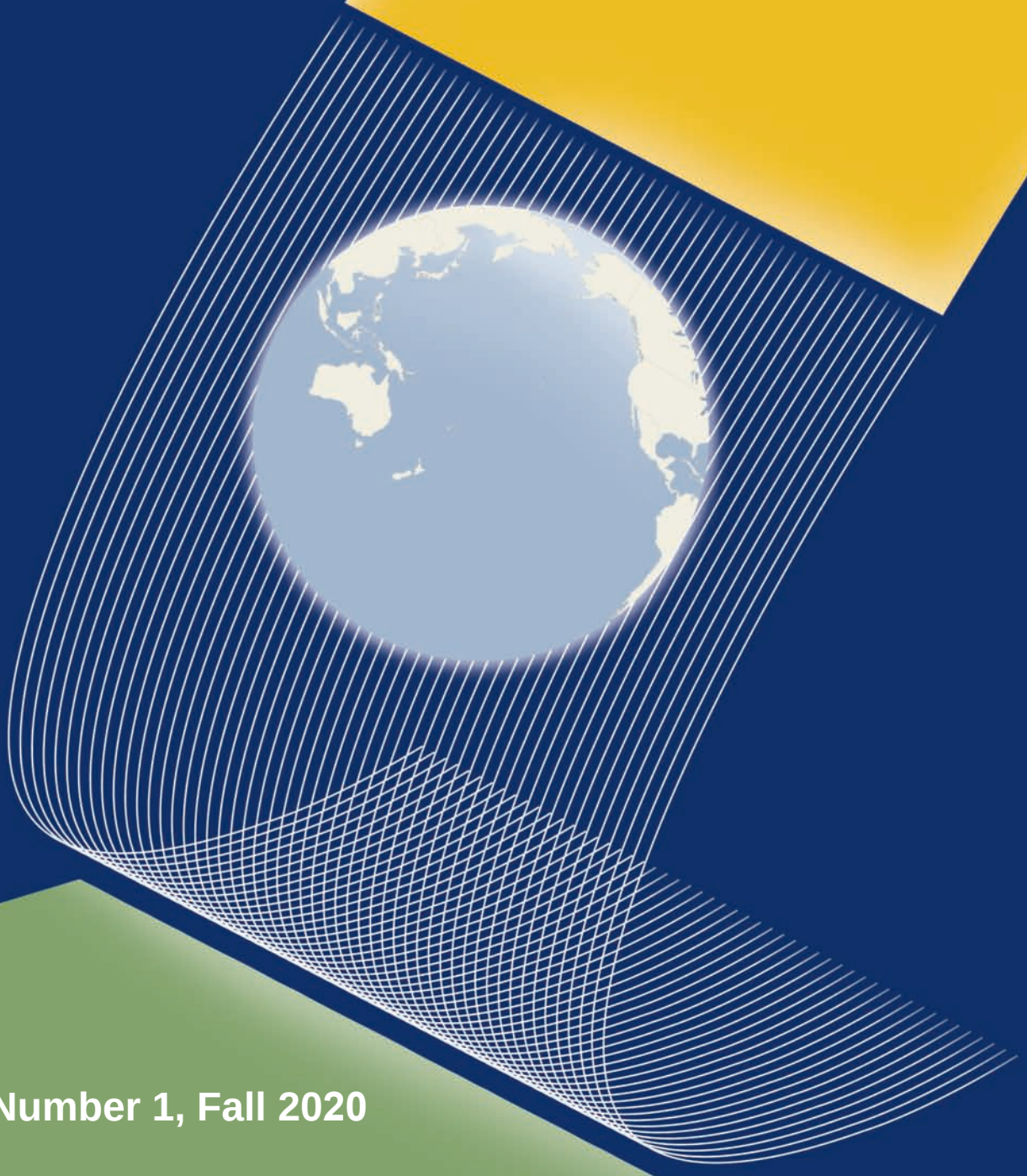
Pacific Asia Inquiry

Multidisciplinary Perspectives

Occasional Papers in the Liberal Arts and Social Sciences



Volume 11, Number 1, Fall 2020

Pacific Asia Inquiry

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Editorial Board

College of Liberal Arts and Social Sciences, University of Guam

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Editorial Policies

Pacific Asia Inquiry is a peer reviewed on-line journal dedicated to showcasing works on the Pacific Asia Region and to advancing knowledge and understanding of this region. The Pacific Asia has long been the focus of intense cultural, political and economic interaction with other world regions, and it is the central theme of this journal.

Pacific Asia Inquiry analyzes and publishes contributions from a wide scope of works - national and international, regional and global, historical and current. Contributions are drawn from multiple disciplines in the liberal arts and social sciences - including sociology, psychology, communication, language and literature, visual arts, music, drama, history, geography, anthropology, philosophy, political science and economics. This journal appeals to academics, policy makers, and both government and non-government professionals with an interest in the Pacific Asia Region. Special edition themes under consideration include Economic Development and Social Change, Militarization in Pacific Asia, Culture Change and Global Interactions, After Orientalism, and Trends in the Visual Arts.

The Editorial Board of *Pacific Asia Inquiry* welcomes theoretical and field oriented contributions and analyses. Articles, critical essays, and case studies applied or theoretical that span the liberal arts and social sciences are welcome. The research emphasis of this series accommodates in-depth studies. Contributors are invited to share their innovative research, challenging past and current positions and perspectives. Any interdisciplinary approach may be employed so long as it is documented in a readable style of writing that is accessible to specialists and non-specialists alike. Authors may submit their writings on problems and issues associated with any ethnic group, national culture, historical period, genre, or media so long as the article has some scholarly and/or intellectual relevance or relation to Pacific Asia, especially Micronesia.

All submissions and editorial inquiries should be addressed to the Editor of the next volume, Dr. Mary L. Spencer, Psychology and Micronesian Studies, College of Liberal Arts and Social Sciences, University of Guam, UOG Station, Mangilao, Guam 96923, email: pacific.asia@triton.uog.edu. See final page for submission procedures.

Editors' Note

Sharon Māhealani Rowe and James D. Sellmann

The year of the global pandemic, 2020, was challenging for everyone. Living in quarantine for months at a time, working remotely or being laid-off proved to be more stressful than expected. Despite the difficulties, scholars continued to engage in research, writing and publication. The contributors to *Pacific Asia Inquiry* volume 11 are commended for their diligence, and their ability to continue to do research, write, submit their papers, and edit them in a timely manner. The anonymous referees must also be acknowledged for their due diligence by returning edited manuscripts and their insightful comments so that the scholarly peer-review process could be completed in a timely manner. The Editorial Board and especially Leiana Naholowa'a, the layout and design editor, continue to provide valuable insights and efforts to improve the journal. The Co-Editors are extremely grateful to everyone for their assistance in releasing this issue.

The manuscripts in this volume represent fine examples of historical, socio-cultural, environmental (climate change), and philosophical research.

With this issue the journal is initiating a new approach of accepting translations of recently published Pacific scholarship in languages other than English. In this regard, the prolific Spanish historian, Alexandre Coello de la Rosa, carefully analyzes the "Jesuit presence in the Mariana Islands: A historiographic overview (1668-1769)**.**"

In "Agroforestry in the Climate of the Marshall Islands (Green Dashboard): An Interactive Website," by Harley Ichiro Manner, Kathleen S. Friday, Maria Haws, and Lajikit Rufus, you are introduced to the impact of climate change and food security issues in the Marshalls.

A sociological, cultural, and culinary analysis of indigenous Guåhan (Guam) practices are carefully analyzed and linked to traditional values in "Recollections of *Fadang* and *Fanihi*: The Taste and Smell of CHamoru Bygone Foods and the Challenge of Endangered Island Species" by Else Demeulenaere, Donald H. Rubinstein, Sveta Yamin-Pasternak, Amy Lauren Lovecraft and Stefanie M. Ickert-Bond.

In "Using Local Early Action Planning (LEAP) to inform Climate Change Vulnerability Assessments – Guam 2019," by: Romina King, Marcel Higgs III, Kaylyn Bautista, Edward Leon-Guerrero, we are introduced to the results of important grant research at the University of Guam.

Dirk H.R. Spennemann's article, "The Devils of Oki-shima: A Note on a Group of Presumed Micronesian Castaways in Japan," provides early evidence of culture contact between Japan and other Pacific Islanders.

The Co-Editors had hoped to garner papers discussing indigenous Pacific approaches to philosophy. In the end we humbly offer our own peer-reviewed manuscripts.

Sharon Māhealani Rowe offers personnel insights for a Hawaiian epistemology based on her decades-long study of the art of hula in "Where our feet fall: A hula journey into knowledge."

In "Correlative thinking in Pacific Island (Micronesian) cultural philosophies," James D. Sellmann explicates one of the dominant forms of islander reasoning.

We also issued a call for scholars and cultural experts to provide 200-word statements conserving insights about philosophical wisdom in the Pacific. Statements were submitted by N. Kauʻi Baumhofer Merritt, Carl Becker, Andrew Soh, Debra T. Cabrera, Nawaʻa Napoleon, William Jeffery, Mary Therese Flores Cruz, Tarisi Vunidilo, Sutej Hugu, and they are inserted between the articles, accompanied by images submitted by those authors. Our effort here was first and foremost to bring the unique philosophical ideas of Pacific Island cultures more deeply into the academy, to learn from and dialogue with them. We invited contributors to participate in producing pieces under the working title, "Perspectives on Pacific Island Wisdoms." The title envisioned a wide diversity of styles and perspectives—something like a photo album of family resemblances evoking the meanings, values and practices that bring forward the wisdom within Pacific Island experiences and knowledge. Those who contributed responded to the following questions, in less than 100 words:

> What does Pacific Islander/Oceanic wisdoms mean to you?
>
> How/why do you bring Pacific Islander/Oceanic wisdoms into your scholarship, your teaching, or your research?

A secondary goal of this project was to experiment with a more collaborative style of scholarship, welcoming a range of disciplinary content and expressive styles. Here we draw upon Michelle le Doeuff's concept of "open philosophy," which recognizes the non-totalizing and open-endedness of the knowledge project and encourages us to see scholarship as contributory, multi-disciplinary, "plural work." Her approach extols a kind of intellectual humility that knows:

> 'I do not do everything on my own', that I am a tributary to a collective discourse and knowledge, which [has] done more towards producing me than I shall contribute in continuing to produce them; and . . . with a recognition of the necessarily incomplete character of all theorization (p. 127).*

We want to continue drawing Pacific Islander ideas and wisdoms into the academy because we believe, as do several of the contributors, that now is a time to recognize the unique tributary that comes from these places, and to acknowledge that the values, experiences, and knowledge of Pacific Island peoples have something to say for our time.

While each Pacific cultural group expresses uniquely what wisdom is, a singular theme of connection and interconnectedness comes through the voices of all who submitted to this project. This connection is referenced to family and ancestors (Merritt, Napoleon, Vundilo), to community (Becker, Cruz, Cabrera), and to our relationship and interdependency with others, including non-human others in the wider, natural world (Soh, Hugu).

A secondary theme, which follows from the first one, is that of sustainability and a need to sustain connections to custom, culture, language, and ancestral knowledge, as well as to practices that can continue to bring vitality and sustenance to human and environmental well-being. Here harmony, humility, and aloha express values capable of sustaining these important connections and building upon a recognition of common human needs and the value in diversity.

Finally, we recognize the cautionary note expressed by Jeffery that "Pacific Island / Oceanic wisdom is a bit of a misnomer." His correction that "Islands cannot have wisdom, but Islanders can," that we should rather recognize and speak of "Indigenous Islanders' wisdom," reflects the lived experience over time of people who can and have lived sustainably, within the limits of their environments.

This links to Cruz's cautionary tone that "[i]n the endeavor to promote Pacific island wisdom, it is imperative that we do not see this as a mere tool of research but for its inherent value in preserving, sustaining, and building our peoples and communities."

Our goal is to include articles that address these needs and honor the achievements of Pacific Island cultures, allowing them to contribute to and inform more broadly our understanding of ourselves and our common world.

*M. le Doeuff (1989). *The Philosophical Imaginary*. (Colin Gordon translator). Stanford, CA: Stanford University Press.

Wisdom was the Warmth of my Grandmother's Bosom

Nawaʻa Napoleon
Kapiʻolani Community College

What does Pacific Island/Oceanic wisdom mean to you?

When I was a child, wisdom was the warmth of my grandmother's bosom where I would fall asleep. When I was a teenager, wisdom was my mother reminding me how her mother use to hold me in her arms as I fell asleep in her poli. I am now just past a half a century old and wisdom is my niece falling asleep in my arms with her manawa on my umauma.

How/why do you bring island wisdom into your scholarship?

Sit and let me share a succession, a series of stories that tells of how we come from the sacred drum that beats the sounds of lava gushing through the crevices of Mother Earth and being released into the sky. These stories I tell you - so we can find how we are similar rather than different. Should you only see the difference between us - I will carry you until you come to realize that you are tired of being a burden and would rather be a solution and walk beside me.

Wisdom is Mana!

Tarisi Vunidilo
University of Hawai'i at Hilo

What does Pacific Island/Oceanic wisdom mean to you?

Oceanic wisdom is part of my being and my DNA. I feel, think, dance, speak and breathe my Fijian-ness. This wisdom grounds me and shapes my view of the world. It reminds me of how blessed I am today due to the wisdom that my ancestors have passed on to my 'vuvale (family). It continues to re-connect me to my rich indigenous iTaukei past, strengthens me today and enables me to dream and envision my future with great optimism. This wisdom has substance, mana (power) and can propel me to a brighter future in front of me. WISDOM IS MANA!

How/why do you bring island wisdom into your scholarship?

I made a promise to myself to lead by example and 'walk the talk.' With my teaching profession spanning Fiji, Aotearoa and Hawaii, I have tried my very best to bring my island wisdom to all whom I meet, and to teach and empower my students never to forget their roots. I believe that imparting such wisdom is important to our students' identity. I encourage my students to value their language, their culture and indigenous knowledge. They can sing, dance, and write about these knowledges too. I enjoy being a teacher! Mahalo nui.

Jesuit Presence in the Mariana Islands: A Historiographic Overview (1668-1769)*

Alexandre Coello de la Rosa
Universitat Pompeu Fabra

Dedicated to Marjorie G. Driver (†2019)

Abstract

This article is a historiographic overview of the conquest and evangelization of the Mariana Islands (XVII-XVIII centuries). Since the pioneering work of renowned scholars of Micronesian history, such as Marjorie G. Driver and Francis X. Hezel, historians, archaeologists and anthropologists have analyzed Jesuit missions not only as a complement to colonial power dynamics in the Asia-Pacific, but also as a privileged field for analyzing cross-cultural encounters. Faced with essentialist approaches that question the "aboriginal" character of the current CHamoru of the Marianas, other studies question their supposed disappearance, and appeal to their cultural continuity in historical time. It is also a small tribute to Marjorie G. Driver, pioneer in colonial studies on the Spanish presence in Micronesia, who left us on September 20, 2019, at the age of 95.

Keywords: Jesuits, Mariana Islands, 17th and 18th centuries, Pacific Ocean, globalization.

Introduction

The island of Guåhån (or Guam) is the largest and southernmost of the isles and islands that comprise the Marianas archipelago, a set of fifteen volcanic and coral islands that extend from north to south, forming a wide arc of more than 800 kilometers in the western Pacific, between the Tropic of Cancer and the Equator (Ciaramitaro, 2018, p. 198). Most of them are very small and practically uninhabited (*terrae nullius*), but the largest, inhabited islands have good aquifers and fertile land as well as bays and coves that make them accessible and safe for navigation.[1] Evidence suggests that

* This article is primarily an expanded English version of an article previously written in Spanish for *e-Spania* (2020). It is part of the project *Mediaciones Culturales en los Imperios Ibéricos: Diplomacia Intercultural y Misiones en Asia y el Pacífico (siglos XVI-XVIII)*, PI: Joan-Pau Rubiés (MINECO/AEI FFI2016-79496-P). I want to thank Scott Arthurson for his proof-reading, the (co)editor of *Pacific Asian Inquiry*, James D. Sellmann, and the helpful comments of the reviewers, which helped me to sharpen my arguments.

[1] The archipelago is composed of two sets of islands. The southern islands include Guåhån (also Guajan, Guahan, Guam or San Juan); Luta (also Rota, Zarpana or Santa Ana); Aquigan or Aguiguan (also Santo Ángel); Tinian (also Buena Vista Mariana); and Saipan (also San José). The northern isles, most of which are uninhabited and experience more volcanic activity, are collectively referred to as Gani in the CHamoru language, and include Farallón de Medinilla; Anatahan (San Joaquín); Sarigan or Sariguan (San Carlos); Guguan (San Felipe); Alamagán (La Concepción); Pagán (San Ignacio); Agrijan or Agrigan

the first settlers were probably Austronesians originating from the northern Philippines or Maritime Southeast Asia circa 1500 BCE (Jalandoni, 2011, p. 28; Montón, S., Bayman, J., Moragas-Segura, 2018, p. 309).

The conquest and colonization of the far-off Marianas was never a profitable enterprise for the Spanish Crown. Compared to the wealth promised by the metal-rich American continent, the Marianas' lack of precious metals seemed to justify the minimal attention that the Crown paid them. Their topography, crisscrossed by small gullies and ravines, discouraged large-scale agriculture. Moreover, their coasts were not easily accessible to the galleons en route from Acapulco to Manila.[2] But none of this deterred the Jesuits, who, led by Father Diego Luis de San Vitores (1627-72),[3] wanted to plant the seed of the Gospel in these lands and join the ranks of the martyrs who died for the Catholic faith.

The contemporary historiography agrees that the permanence of the mission was not determined by geographic, economic or demographic factors –the archipelago's isolation; its poverty and lack of mineral resources; or its relatively scarce population. The first transactions between CHamoru society and Micronesian cultures, and the later trade with European ships after the initial landing of Fernão de Magalhães (1480-1521) in Guåhån on March 6th, 1521, probably in Umatac Bay,[4] constituted different phases of a continuum of regional and global exchanges between Europeans and the inhabitants of the Marianas archipelago (e. g., Kushima, 2001; Quimby, 2011, pp. 1–26; Thomas, 1990, pp. 146–47).[5] The frontiers, or contact zones, are not rigid lines that separate groups of culturally distinct peoples,[6] but ambivalent spaces, fraught with contradictions, where the active agents of what Serge Gruzinski (2004) denominated "the first globalization" played a fundamental role in the cultures' transformation (Gruzinski, 2004; Mola, 2018, pp. 181-200).

In the last few decades, historians have interpreted the first modern Catholic missions not only as a complement of Western imperialism, but as a field in which complex intercultural encounters with several logics took place (Rubiés, 2013a, p. 267).[7] By situating Jesuit missions in a global process that underlines the cultural and economic relations between Europe and the Micronesian islands, recent studies have looked at the possibilities and limitations of religious conversion in Guåhån and the

(San Francisco Javier); Asonson or Sonsong (Asunción); Maug, Mangs or Mangas (San Lorenzo or Las Monjas); and Uracas or Urracas.

[2] "Informe del padre Luis Pimentel, provincial de las islas Filipinas de la Compañía de Jesús de las conveniencias e inconveniencias que puede tener la reducción a nuestra sancta fe católica de las islas que llaman de Ladrones" (ARSI, Philipp. 14, ff. 64r–68r; Reichert, 2014, p. 162).

[3] For a brief biography of Diego Luis de San Vitores, see Saborido Cursach, 1985; Baró Queralt, 2010, pp. 16-19.

[4] Not surprisingly, Umatac Bay is nowadays an important place in the collective memory of the island of Guåhån. See Montón, S., Bayman, J., Moragas-Segura, 2018, pp. 320-21.

[5] The exact location of Magellan's landing place is still a matter of debate. See Rogers and Ballendorf, 1989, pp. 193-208.

[6] The concept of "contact zone" was first coined by Adorno, 2007, p. 329. See also Pratt, 1997, pp. 1-11.

[7] For an analysis of the development of a "mediating contact culture" between Spaniards and CHamoru, see Quimby, 2011, pp. 1–26; Quimby, 2012.

islands north of Saipan (collectively referred to as Gani). There, the *encomiendas*, or the Spanish system of forced labor that characterized most of the Americas and the Philippines, did not prevail. Between 1686 and 1700, after the second Spanish-CHamoru war (1684), Jesuits tried to reduce the native CHamoru—whom they often referred to as *Marianos*—into six parishes of Guåhån.[8] This period, known as "La reducción" (the Reduction), saw the consolidation of a series of disciplinary and heterotopic technologies on the islands (Moral de Eusebio, 2016, pp. 229-232), which resulted in a system of sociopolitical organization—reductions, schools, haciendas—that guaranteed the functioning and exploitation of native labor in royal haciendas (Driver, 1991; Dixon, Welch, Bulgrin and Horrocks, 2020, pp. 70-71).

At the turn of the century, the native population was dwindling, and some Jesuit missionaries contemplated the possibility of abandoning the Mariana Islands and relocating, with the reduced CHamoru, to the Visayan missions of the Society of Jesus, which were threatened by the continuous razzias sent by the Muslim states of the southern Philippines (Mindanao, Jolo) (Coello de la Rosa, 2019, pp. 729-763). Others wanted to use the Mariana archipelago as a springboard to explore and evangelize other Pacific islands further south (such as Palau and the Carolina Islands). In any case, it was in 1731, after the failure of the reconnaissance mission led by Father Giovanni Antonio Cantova (1686-1731), that the Spanish Crown decided to withdraw exploration missions and bolster its presence in the Marianas. These Oceanic islands continued the spiritual tutelage of the Jesuits until 1769, when the Society of Jesus was finally expelled from the Philippines.

The present essay shows that these imperialist strategies of power and domination have obscured other, local dynamics through which the native CHamoru opposed European normativity and/or submitted to them through transcultural processes. Likewise, it reviews a new historiography of the Marianas, which locates the islands and its peoples within the global history of Christianity. Within this framework, scholars have rejected the notion that the "true" CHamoru disappeared due to their destruction, extinction, and "mixing" with other groups, which had led to the representation of the surviving CHamoru as non-native. Defying the center-periphery model, indigenous peoples are addressed as active participants in the elaboration of politics at a greater scale and not passive, defeated recipients of Western ideas and customs. The relationships established between European, American, Asiatic and Oceanic peoples are seen as historically changing interactions and negotiations embedded in the global circulation of ideas. Instead of emphasizing the supposed isolation and distance of the Mariana Islands, the "new missional history" works from a "glocal" perspective and situates the CHamoru in the international community as members of the Spanish empire and the global Catholic Church.

One of the main tasks when writing on the global conscience of the Jesuit project is determining the geographic limits of the territories of Spanish Asia that were a part of the Viceroyalty of New Spain (Luque Talaván and Manchado López, vol. 1,

[8] Taitano, Origin of CHamoru as an Ethnic Identifier. Retrieved from https://www.guampedia.com/origin-of-chamorro-as-an-ethnic-identifier/

2008, pp. 13–15).[9] If the Captaincy General of the Philippines was in the rearguard of what once was known as "the Spanish lake" (1513-1607) (Schurz, 1922, pp. 181–94; Spate, 1979; Bernabéu Albert, 1992; Martínez Shaw*, vol. 1*, 2001, pp. 3–25, pp. 7–17) but which should have been known, in Bonialian's words, as "*un lago indiano*" (Bonialian, 2017, p. 136),[10] the Marianas were a marginal space within that rearguard, a transit point between New Spain and Manila that some French intellectuals would probably represent as a "non-place" (De Certeau, 1992, pp. 186–87; Augé, 1992). As Ulrike Strasser points out, the history of the Marianas constitutes an intriguing exception to the rule of Spanish conquest and expansion, which was officially ended in 1573. While the Spanish monarchy was undergoing a political and economic crisis, the impulse to establish a mission in the Marianas archipelago was taken up exclusively as a Jesuit initiative. The Society of Jesus, and particularly, Father Diego Luis de San Vitores, longed to evangelize the natives who lived there and were entirely indifferent to the islands' profitability or usefulness for the Crown (Strasser, 2017, p. 212; Strasser, 2020, pp. 113-46).

The Jesuit Arrival in the Philippines

By the mid-sixteenth century, the Spanish Crown had established an overseas empire of colossal dimensions (Schmidt, 2012, pp. 451–66). European trade in the Far East, established since the fifteenth century, wove a network of "articulated" circuits that played an important, if irregular, role in the growing Atlantic trading system (Bailyn, 2009, p. 4). Throughout the sixteenth and seventeenth centuries, Christian missions were key propagators of European "civilization" and its systems of knowledge (Prosperi, 1992, pp. 189–92). Christianity, as a matter of principle, did not tolerate religious diversity. Its universalistic vocation tied the historical and moral unity of humanity with the one true religion. As a frontier institution, the Jesuit mission sought to incorporate the indigenous peoples into the Spanish colonial empire by converting them into Catholicism, which necessitated the adoption of significant cultural norms, after having established formally recognized communities of sedentary converts under the tutelage of missionaries and the protection and sovereignty of the Spanish Crown.[11] This joint institution of indigenous communities under the tutelage of missionaries was meant to counter, or at least, check, the power of soldiers and

[9] Transpacific trade's importance grew after Chinese traders settled near Manila (Parián, Binondo). Traders were limited to a cargo of 250.000 pesos de 8 reales in merchandise from Manila to Acapulco. On the return trip, galleons could bring to the archipelago 500.000 *pesos fuertes de plata* (8-reales silver coins), out of which came the salaries of government employees, payroll for the soldiers, and stipends for the missionaries (the *situado*) (Yuste López, 1984, pp. 10; 14). In 1702, these quantities were increased to 300.000 "pieces of eight" of products from Asia and 600.000 pesos of silver (Yuste, art. cit., p. 15). In 1734, they were increased again, to 500.000 pesos of merchandise embarked in Manila, and one million silver pesos from Acapulco (Schurtz, 1992; Yuste López, art. cit., pp. 15-16; Yuste López, 2008*,* vol. 1, pp. 195-216; pp. 202-205).

[10] "Indianos" were the peninsular Spaniards who made their fortunes in the Americas and returned to the peninsula. In this case, they moved on to the Philippines.

[11] Hausberger, 1997, p. 63, cited in Ciaramitaro, 2018, p. 199.

functionaries in the expanding frontier, who often abused native labor, provoking unwanted antagonisms and discontent (Wright, 2019).

In the context of the creation of new imperial spaces,[12] the Society of Jesus, considered the first global religious organization, led the cultural and religious assimilation of the Spanish and Portuguese eastern kingdoms (Clossey, 2006, pp. 41-58; Clossey, 2008, pp. 1–19). The Jesuits arrived in the Philippines on 1581 from New Spain, where they became agents of transformation of the cultures with which they interacted. Schools or colleges were the starting point, and from there, the members of the Society organized "flying missions", which were soon followed by the "long missions" sent to groups of "infidels", most importantly in the Visayas and the southern Philippines.[13] To deal with these multiple fronts, General Claudio Acquaviva (1581-1615) sent twenty-five priests, under the auspices of Philip II (1556-98), who promoted a royal decree that separated the mission territory in that *finis terrae* into four areas: Pampanga and Ilocos, which were to be under the tutelage of the Augustinians; Camarines and Tayabas, under the Franciscans; the Visayas, whose tutelage would be shared by Augustinians and Jesuits; and the sangleyes of the Manila Parian and the provinces of Pangasinan and Cagayan, entrusted to the Dominicans for evangelization (García de los Arcos, 1988, pp. 50–51). The lion's share went to the Franciscans and the Augustinians, while the Jesuits received the poorest and least populated areas of Samar and Leyte (O'Phelan, 1967, pp. 49–50; Gutiérrez, 1992, pp. 71–73; 204; Gutiérrez, 2011, p. 471).

In the Philippines and in other parts of the Spanish empire, the notion of "good government" or policing, in Aristotielian terms—*politeia*—entailed the care and control of the population. This was accomplished by submitting the native populations to their parishes, which were founded on the basis of a new global Catholic perspective. As argued by Richard Kagan, "for Spaniards, *policía* signified life in a community whose citizens were organized into a republic" (Kagan, 2000, p. 27). Jesuits, like the rest of the priests and missionaries, were not only acting as ministers of God, but also as political and economic administrators of the missions in their charge. In theory, they tended to reach their goals: natives were evangelized, transformed into Christians by means of the missionary activity. But in practice, the Jesuit identity was transformed by the variegated relations entered into with indigenous peoples and persons during several decades—resistance, negotiation, appropriations, resignifications, and accommodations.[14]

[12] My understanding of the concept of "empire" is invested in the idea of "webs of trade, knowledge, migration, military power, and political intervention that allowed certain communities to assert their influence and sovereignty over other groups" (Ballantyne and Burton, 2005, p. 3).

[13] For an analysis of "different types of misión", see Maldavsky, 2012, pp. 71–124.

[14] Regarded as a specific characteristic of the Society of Jesus, "accommodation" has been defined as a process of flexibility that allowed Jesuits to accept cultural elements of non-Western societies that they believed did not conflict with Christian dogma (Catto and Mongini, 2010, pp. 1–16). On the strategies of evangelization of Italian Jesuits Alessandro Valignano (1539–1606), Michele Ruggieri (1543–1607) and Matteo Ricci (1552–1610) in China, see Standaert, 2000, pp. 352–63.

Spiritual Heroes at the Margins of the Spanish Empire

The Portuguese sailor Fernão de Magalhães named the Marianas *Islas de las Velas Latinas*, or Lateen Sail Islands,[15] but after what can only be characterised as a cultural misunderstanding, he later referred to them as the *Islas de los Ladrones*, or Islands of the Thieves.[16] For many years after this first encounter, the archipelago continued in its relative isolation, with the occasional arrival of ships from other Micronesian islands, Japan, China, or the Philippines, which was sometimes caused by tempests, and had been a recurring phenomenon since before the European presence in the Eastern seas (Farrell, 1991). Not to forget the addition of ships from Spanish expeditions that were still seeking a permanent route to the Moluccas, such as those led by García Jofre de Loaysa and Juan Sebastián Elcano (which arrived at the islands on September 9th, 1526); Álvaro de Saavedra Cerón (December 29th, 1527); Bernardo de la Torre (1543), who was part of Ruy López de Villalobos' expedition (1542); and Miguel López de Legazpi, who arrived at the island of Cebu in May, 27, 1565, and recognizing their value as a strategic transit point in transpacific navigation and commercial routes, took possession of them in the name of the Spanish Crown (Buncan, 2017, p. 22).

Shortly after the successful discovery of the "tornaviaje" (or the return route) in October 8, 1565, king Philip II granted Legazpi the title of "adelantado" of the Ladrones Islands on August 14th, 1569, whose Instructions of government, given on the 28th of August in Madrid, insisted on the islands' occupation and evangelization (Mira Toscano, 2016, pp. 107-122). However, the islands' apparent lack of economic resources, and the consequent indifference displayed towards them by the Philippine governors, under whose jurisdiction they lay, meant that such instructions went unheeded (Peña Filiu, 2019, Chap. 3). In 1596, the monarch insisted, and granted Philippine Governor Francisco Tello de Guzmán (1596-1602) permission to send soldiers and missionaries to the islands. But this also went unheeded, despite the efforts of Franciscan friars Antonio de los Ángeles (1596) and Juan Pobre de Zamora (1602), however, it laid the ground for a new impetus in the process of evangelization (Driver, 1989).

During the second half of the 17th century, Father San Vitores revived the Franciscan project of the western Pacific Ocean as a widespread field for conversion. As Buschmann pointed out, "he envisioned Guam and the Mariana Islands as a beachhead for additional mission activity in the Austral lands" (Buschmann, 2014, p.

[15] The name referred to the great number of ships that came towards Magalhães' ship with what are now known as tanja sails, which resembled lateen sails. See Antonio de Herrera and Tordesillas, 1601, p. 6.

[16] The expedition's chronicler, Antonio de Pigafetta, mentioned this first encounter in his *Relación*, describing how the Spaniards accepted the food supplies brought to them by the natives and offered nothing in return, after which the natives stealthily boarded the ships and took various objects "in such a way that it was impossible to preserve oneself from them" (Pigafetta, 1922, p. 74). The CHamoru even took the skiff that was tied to the poop of the captain's ship (Trinidad). In all likelihood, what they regarded as a reciprocal and ceremonial exchange of gifts, which is commonly performed in many Pacific island cultures between two groups that meet for the first time, was taken by the European expeditioners as an act of thievery.

31). In May of 1665, Father San Vitores wrote a memorial entitled *Motivos para no dilatar más la reducción y la doctrina de las islas de los Ladrones* [Reasons not to delay further the congregation and the instruction of the Thieves' Islands], in which he detailed the political and economic reasons for the archipelago's evangelization. In some parts of the text he spoke of the islands' abundance of resources, while in others he underlined their dearth (Peña Filiu, 2019, Chap. 3). Notwithstanding this ambivalence, San Vitores displayed a "discourse of poverty" meant to show that a complete disinterest in mundane affairs framed the enterprise that he proposed (Baró Queralt, 2010, pp. 20-21; Coello de la Rosa, 2011, pp. 779–808; Atienza, 2013, pp. 13-29).

The colonization of the archipelago started on June 15th, 1668, when San Vitores and five other Jesuits arrived at Guåhan from the Viceroyalty of New Spain with the economic support of Queen Mariana of Austria (1649-65) (Reichert, 2014, p. 161). But the Spanish period per se did not officially start until February 2, 1669, when the Jesuit Father, accompanied and assisted by a small number of soldiers and missionaries, inaugurated San Ignacio de Agaña (or *Hagåtña*, in today's Apra Harbor), the first mission in the island of Guåhan, the site of which is the present capital of the island. The arrival of the Society's missionaries brought about the definitive change in the archipelago's name, which was thereafter referred to as the Mariana Islands, in honor of then regent Queen Mariana of Austria, widow of Philip IV (1621-65) and mother of future King Charles II (1665-1700). Regarded as the "protector of the islands' Christendom", Queen Mariana authorized and financed with 21,000 pesos the establishment of San Vitores' mission in Guåhan (Astrain, 1920, p. 811; De la Costa, 1989, p. 456; Ciaramitaro, 2018, pp. 196-197). Regularly from 1668 on, the annual Manila galleon crossed the Pacific in about latitude 12°-13°N., directly to Guåhan, thereby inaugurating what Thomas Calvo termed as the "Carrera of the Marianas" (Calvo, 2016; Calvo, 2020, pp. 49-80). In 1679, the archipelago was placed under the jurisdiction of the Audiencia of the Philippines and the Viceroyalty of New Spain—on which it depended economically—and remained part of the Spanish overseas territories for more than two centuries.

For their European counterparts, the Jesuit missionaries soon became the "heroes" of the Catholic reformation in the Pacific. From 1670 to 1731, fifteen Jesuits died for their faith in the Mariana Islands and Palau (the present Western Carolinas). As many missionaries saw their activity culminated in martyrdom, others followed suit (Schumacher, 1995, pp. 266–85; Schumacher, 2001a, pp. 287–336; Schumacher, 2001b, pp. 477–85; Mojares, 2000, pp. 34–61; Coello de la Rosa, 2011, pp. 707–45; Strasser, 2015, p. 561; Strasser, 2020).[17] The first martyr was Father Luis de Medina (1637-70), who died on January 29th, 1670, alongside his Philippine catechist Hipólito de la Cruz, in the island of Saipan, where they had gone to resume their preaching.[18] In 2014, Alexandre Coello and Xavier Baró reedited the martyr's first hagiography, the

[17] On the connections between the renowned mystic, Catherine of Siena, and the martyrdom of the German Jesuits in the Marianas, see Strasser, 2007, pp. 23–40.

[18] Hezel, SJ, Retrieved from https://micronesianseminar.org/in article/jesuit-martyrs-in-micronesia/ (last visited 2 October 2020).

Relación de la vida del devotísimo hijo de María Santísima y dichoso mártir Padre Luis de Medina de la Compañía de Jesús (Madrid, 1673), written by Father Francisco García (1641-85), SJ, with the object of raising him to the altars (Coello de la Rosa Baró i Queralt, 2014, pp. 9–36). Like Father Medina, Father San Vitores and other Mariana martyrs proved to be motivated not by the desire for profit or adventure, but by a great desire to save their own and others' souls in the islands of the Pacific that were yet to be evangelized.

At the beginning of the eighteenth century, Father Charles Le Gobien (1653-1708), SJ, who had promoted the *Lettres édifiantes et curieuses, écrites des missions étrangères* (Paris: N. Leclerc, 1707-1776), supervised the composition of the first historical text on the archipelago, the *Historia de las Marianas* (Paris: Nicholas Pepie, 1700). The Jesuits had instructions of sending detailed reports of their pastoral activities in the Pacific islands to their superiors in Rome, and the narrative made use of the reports and letters written by Father Luis de Morales (1641-1716) and other Jesuits on the topography and geology of the islands as well as their flora and fauna, and, most importantly, the culture and social and political organization of the CHamoru (Morales and Le Gobien, 2016). One of the most important sources used by Le Gobien was The *Life and Martyrdom* of his confrere, Father San Vitores, which had been published by his Jesuit companion Francisco García in Madrid in 1683 (an expanded Italian translation of this text had been published in Naples in 1686),[19] but Father García, a publicist of the order in King Charles II's court in Madrid, decided to write a hagiography of Diego Luis San Vitores to promote the beatification of the mission's founder, regarding his life as a re-actualization of that of the Apostle of the Indies, Father Francisco Javier, canonized in 1622 (Ciaramitaro, 2018, pp. 201-202).[20]

As has been recently pointed out by Joan-Pau Rubiés, García's hagiography contained the first historical text of the Marianas, as is evidenced by the similarities found between it and Le Gobien's book. The second "book" of the *History*, regarded as an ethnographic jewel of the CHamoru people, follows García's writings very closely, and not just the published hagiography, but other texts copied from his narrative, such as the *Vida, y martirio del V. Padre Sebastián de Monroy, religioso de la Compañía de Jesús, que murió dilatando la Fe alanceado de los bárbaros en las islas Marianas* (Sevilla, 1690) written by Father Gabriel de Aranda, SJ (1633-1709). This would prove,

[19] The Italian version, *Istoria della conversione alla nostra santa fede dell'Isole Mariane, dette prima de' Ladroni, nella vita, predicatione, e morte gloriosa per Christo del Venerabile P. Diego Luigi di Sanvitores, e d'altri suoi compagni della Compagnia di Giesù*, translated by Ambrosio Ortiz (Naples, 1686), includes sections that describe the CHamoru revolt of 1684. The modern English translation, *The Life and Martyrdom of the Venerable Father Diego Luis de San Vitores First Apostle of the Mariana Islands, and Events of These Islands, from the Year Sixteen Hundred and Sixty-Eight, Through the Year Sixteen Hundred and Eighty-One*, was edited by J. A. McDonough, SJ, et al. (Mangilao, Guam, 2004).

[20] It was not in vain that some authors, such as Baró Queralt, argue that in 1661, while San Vitores was in New Spain, he wrote the monograph on Francisco Javier titled *El Apostol de las Indias y nuevas gentes, San Francisco Javier de la Compañía de Jesús, epitome de sus apostolicos hechos, virtudes, enseñança, y prodigios antiguos y nuevos* (Mexico: Augustin Santistevan y Francisco Lupercio, 1661), under the pseudonym Matías de Peralta y Calderón (Baró Queralt, 2010, pp. 26-29). Other authors attribute this text to Alonso de Maluenda or Cristóbal Berlanga, SJ.

as argued by Alexandre Coello in the first English edition of the *Historia de las Marianas* (Mangilao, Guam: 2016), that the true authors of the text were Spanish Jesuits, and more specifically, the procurator Luis de Morales, who probably gave Le Gobien the texts that he then used to draft the *Histoire des Isles Marianes, Nouvellement converties à la Religion Chrestienne; & de la mort glorieuse des premiers Missionnaires qui y ont prêché la Foy* (Paris: Nicolas Pepie, 1700). In any case, the attention that Le Gobien paid to the new mission of the Marianas (as Joan-Pau Rubiés points out in the prologue of that 2016 edition) was part of the Society's apologetics for the missionary activity, a propagandistic effort in which Le Gobien was becoming specialized.

Scherer Map, 1702. Micronesian Area Research Center (MARC), Guåhån

At that time, the Jesuits found themselves in a delicate position throughout Catholic Europe. First, Jansenists accused them of lax morals, of following Molinism, and embracing a probabilistic theology. Secondly, by the mid-seventeenth century the Chinese Rites Controversy exploded because Father Matteo Ricci (1552-1610), SJ, had sought to make Catholicism and Confucianism's ethical principles compatible, which increased the Society's problems. Critics of Ricci's methods argued that the ritual reverence displayed by the Chinese towards their ancestors and towards Confucius himself went beyond civil rites of respect, and constituted instead a religious cult, a form of idolatry. A similar controversy arose regarding the fusion of Malabar rites and Catholicism in southern India, and all this contributed to a full-blown questioning of the Jesuit mission and its method of cultural adaptation. Nevertheless, the Society of Jesus increased and prospered in France during the reigns of Louis XIII (1610-43) and Louis

XIV (1643-1715). In line with the order's propagandistic tradition, the publication of a book on the Jesuits' interest in evangelizing a people that inhabited such "marginal, poor and abandoned" islands as the Marianas meant that Le Gobien could better defend the Society's reputation against accusations that it was only interested in working in rich and prosperous societies, such as those in Japan, Siam, and, especially, China. The Marianas' mission showed that Jesuit missionaries were martyrs of the faith with a genuinely universal apostolic vocation (Rubiés, 2016).

Historians and anthropologists such as Francis X. Hezel, David Atienza, Ulrike Strasser, Alexandre Coello and Fernando Ciaramitaro, have written on the martyrial phenomenon in the Micronesian archipelagos. In a brief, unpublished article from 1983, Hezel looked at the Jesuit martyrs of the Marianas and the Carolinas, especially the consequences that their martyrdom brought to the Society of Jesus' missionary projects throughout the eighteenth century, until they were expelled from the Spanish overseas territories.[21] Ciaramitaro, for his part, analyzed the Jesuit martyrdoms from the imperial Catholic perspective, that is, as titles of legitimation. The Catholic monarchy's devotional vocation was vindicated through a hagiographic and iconographic repertoire that glorified the Spanish conquest of the Mariana archipelago and the foundation of a latter "missionary state" (Ciaramitaro, 2018, pp. 195-225). The monarchical-martyrial exaltation of Queen Mariana of Austria, engraved by Joseph Mulder (1658-1742) in the work written by Father Gabriel de Aranda, *Vida, y gloriosa muerte del V. Padre Sebastián de Monroy*… (Madrid, 1690), does not constitute an exception, but the norm for the penetration of the Catholic and civilizing message into the Western Indies and the Philippines (Ciaramitaro, 2018, pp. 205-225).[22]

In her superb book of 2020, Ulrike Strasser recovered a 2015 article to show "how mimesis of Francis Xavier played itself out in the lives of two Jesuits, the Spanish Father Diego Luis de San Vitores and the Bohemian Father Augustine Strobach (1646–1684), who sought to emulate the 'Apostle of the Indies' in the Marianas, long after his death and canonization" (Strasser, 2015, p. 561; Strasser, 2020). She argues that "they were 'virtual copies' of Francis Xavier with a twist: while the original Xavier longed for martyrdom in vain, San Vitores and Strobach were able to shed blood for the faith" (Strasser, 2015, p. 558). It was in the very act of preaching the Gospel to those distant souls that lived in a group of islands in the immensity of the Pacific, that the Jesuit missionaries, according to Strasser, developed a preoccupation for less distant souls: their own (Clossey, 2008, p. 134).[23] These powerful spiritual motives, already

[21] Hezel also reminded readers that the history of the Jesuits in Micronesia did not end with their expulsion: the region was again "made fertile by the blood" of Jesuit martyrs in 1944, when six Jesuit missionaries and four Palauan auxiliaries were killed by Japanese soldiers.

[22] For a study of the iconography of martyrdom in 17th century Catholic Europe, and particularly, the diffusion of the image of Father Diego Luis de San Vitores' martyrdom, see Payo Hernanz, 2015, pp. 51-98.

[23] This can be perfectly appreciated in the Litterae Indipetarum ("indipetae") in the Fondo Gesuitico of Rome's Archivum Romanum Societatis Iesu (ARSI). Many Jesuits, especially those of Italian and German origins, asked the order's Superior General to send them as missionaries to the Eastern Indies, particularly the Philippines and the Marianas. Apostolic zeal and abnegation were contemplated as the

pinpointed by Pierre Chaunu (1960), stand in opposition to those considered by scholars such as Cynthia Ross Wiecko, who recently referred to the Jesuits as mere agents of the imperial conquest of Guåhan after 1668.[24]

Finally, David Atienza and Alexandre Coello have just published a documentary corpus composed of 149 numbered pages, which was destined to promote the beatification of Jesuit martyr Manuel Solórzano Escobar (1649-84). This epistolary is integrated by ten letters that Solórzano sent his father, Cristobal, after he was destined to depart towards the Marianas, with the first dated May 22nd, 1667, in Carmona, and the last letter that the young priest wrote to him before being stabbed in the head and throat during the second Spanish-CHamoru war (June 6th, 1684) (Coello de la Rosa and Atienza de Frutos, 2021). Solórzano's skull had been sent to Spain along with a bundle of letters by his confrere Diego de Zarzosa, to be delivered to the family of the deceased. Since Manuel's father died a few months before he could receive his son's relics, these were given to a paternal uncle of Manuel, Don Juan Ramírez de Solórzano. Upon his death, the skull and letters went to the missionary's nephew, Don Juan Casquete de Prado Solórzano, and the relics were in his family's custody for two more generations until 1984, when Josefa Jaraquemada Tous de Monsalve, deposited them in the Jesuit School of Villafranca de los Barros, where it remains to this day (López Casquete and Oyola Fabián, 2014, pp. 95-108).

Conflict, Evangelization and Local Agency in the Mariana Islands

A few years ago, the Atlantic first emerged as a field for cultural, geographic and historical studies centered on transoceanic connections, the construction of states and empires, and cultural differences (Bailyn, 2005; Bailyn and Denault, 2007, pp. 1–2; Cañizares-Esguerra, 2006; Elliot, 2007). As a unit of historical analysis, the Atlantic perspective was constructed—or invented, as argued by David Armitage (e.g., Armitage and Braddick, 2002) —to encourage erudition on and analysis of transoceanic history. Many European historians focused on the intra-imperial interactions between metropolitan centers and their overseas colonies. Considering both the Caribbean and the broader Atlantic world as a sub-product of European imperialism, the main preoccupations of Atlantic history were reduced to the logic of an exploitative metropolitan system.[25]

When exploring the cultural and economic interactions and exchanges between the peoples of Western Europe, Western Africa, and the American territories, Atlantic history has adopted a center-periphery perspective addressing the Spanish Empire, which is seen as a result of the modern process of globalization. In the same vein,

most eminent of virtues by these priests who hoped to become martyrs and reach sanctity. For a recent study of the sent from Rhineland and Upper Germany, see Nebgen, 2007.

[24] Ross Wiecko, 2013. Retrieved from http://worldhistoryconnected.press.illinois.edu/10.3/forum_wiecko.html (last visited 2 October 2020).

[25] Other scholars, such as Charles Tilly, preferred to address macro-historical processes, particularly the development of the Atlantic world economy and its continually evolving global circuits. See Leonard and Pretel, 2015, pp. 1-2.

addressing a "Pacific world" as a field of study, with its great diversity and territorial dispersion, would allow us to transcend the national, longitudinal, and teleological structures that are not always adequate, and write a kind of "horizontal", transnational (comparative) and trans-imperial history about some of the most dynamic regions of the *Hispaniarum Rex*.

As Matt K. Matsuda pointed out, however, defining the Pacific is no easy task, but rather an enormous challenge (2006, p. 758). What should be included and what should be left out from this geo-cultural category? Which should be the limits of such an archipelagic (that is, constructed) "Pacific world"? A large part of the recent academic work on the Pacific has been done by historians, anthropologists, archaeologists, linguists, novelists and political activists who question the colonial notions of isolation, impotence and dependence associated with colonial archipelagos. This new interpretative framework regards the Pacific as a "sea of islands", in the words of Tongan writer and anthropologist Epeli Hau'ofa (1939-2009), where constant encounters—through migration and trade—between peoples generated a "mediating contact culture" across what is today Oceania (1994, pp. 148–61). Instead of analyzing the causes behind the disappearance of certain cultures in lost paradises, students of the Pacific influenced by anthropological methodologies and perspectives, such as Nicholas Thomas, Jay D. Dobbin, David Hanlon, Greg Dening, and Vilsoni Hereniko, among others, pay attention to issues of intercultural contact, colonial exchange, political sovereignty, and the cultural preservation of native groups.[26]

Having decentered the Euro-American narratives of discovery, these and other specialists seek to recover the history and cultures of the peoples of the Pacific. But, following the work of William H. Alkire (1977, p. 20) and Robert C. Kiste and Mac Marshall (1999, p. 483), which argued that the "pure" CHamoru had disappeared due to their destruction, extinction, and "mixing" with other groups (mostly from the Philippines, New Spain, and the Iberian peninsula), anthropologists such as Nicholas Thomas (2010) and Jay Dobbin (2011) still refuse to regard the CHamoru as native people (Thomas, 2010, p. 24; Dobbin, 2011). And yet, already in 1994 anthropologist Vicente M. Díaz had argued that CHamoru identity could not be expected to remain static and immobile, and that it should be analyzed as partaking of a process of indigenous agency and situational flexibility[27]. Such interactions were indeed central in the construction of CHamoru cultural adaptation, which is reflected in the present neo-CHamoru culture of Guåhan (Underwood, 1976, pp. 203–209). Moreover, various studies by David Atienza and Alexandre Coello (2012), Atienza (2014) and Francis X. Hezel (2015) argue that CHamoru culture survived the ravages of colonialism, "playing an active role in the historical development of their islands and in the history of the Pacific" (Atienza de Frutos and Coello de la Rosa, 2012, pp. 459–73; Atienza de Frutos, 2014, p. 31; Hezel, 2015, pp. 9–10).

[26] On the centrality of anthropologists in the history of the Pacific, see Matsuda, 2006, p. 767.

[27] Díaz argued that historiographical understandings of CHamoru culture seem to have been constructed in terms of immutability, which have predefined it as a clearly contained and delimited unity that was at some point characterized by pure and essential qualities (Diaz, 1994, pp. 29-58).

Certainly, by analyzing the interaction between the universal principles of Catholicism, these and other scholars have placed the Marianas into the framework of the global microhistory of Christianity.[28] David Atienza (2014, p. 31) and James Perez Viernes (2016, pp. 122-37) have critically assessed the way in which local political actors and actions conditioned the missionaries' work. They reject the reductionist theses of Hans G. Hornbostel (1930), Ian C. Campbell (1989), Don A. Farrell (1989) and Robert F. Rogers (1995), that present the native CHamoru as a Hispanicized people, that is, fervent Catholics and/or "peonized peasants" (Hornbostel, 1930, pp. 73-80; Campbell, 1989, p. 130; Rogers, 1995; Farrell, 2011, p. 189). Others, such as Pedro Cardim, Tamar Herzog, José Javier Ruiz Ibáñez and Gaetano Sabatini (2012, pp. 3–4), challenge the center-periphery model that regards indigenous peoples as passive and silent recipients of Western innovations instead of active participants in the elaboration of politics at a greater scale.

Instead of assuming that the Mariana Islands were isolated and distant, the "new missional history" emphasized cosmopolitanism and circulation of ideas as indicators of the relationships established between European, American, Asiatic and Oceanic peoples. Resistance and/or accommodation vis-à-vis the colonial conflict and actors were significant. As Boyd Dixon, Danny Welch, Lon Bulgrin and Mark Horrocks point out, "archaeological data suggest that CHamoru farmers began (or continued to maintain) the rural farming practice known as the *lancho* not because it was thrust upon them by colonial policy (Hezel, 2015), but to accommodate Spanish repression" (2020, p. 90). The continued interaction and negotiations between the preexisting local realities and the Western attitudes and mores that were finally imposed must not be forgotten. By focusing on this local dimension, other historians have emphasized a process of missional "glocalization" through which the CHamoru entered the international community as members of the Spanish empire and the global communion of the Roman Catholic Church (Robertson, 1997, pp. 25–43; Županov, 1999; Aranha, 2010, pp. 79–204, pp. 79–83).

The book written by Father Horacio de la Costa, SJ (1916-77), *The Jesuits in the Philippines, 1581-1768* (1961), is still the most comprehensive study on the activities of the Society of Jesus in the Philippine Islands.[29] However, said classic monograph contained very few references to the Jesuits in the Marianas, presumably because they were not considered part of the Philippine archipelago even if they were under its jurisdiction.[30] Gender issues were also often neglected. Moral suggests that the

[28] See the monographic issue edited by Bertrand and Calafat, 2019.

[29] For a more recent analysis of Jesuit activity in the Philippines, see Descalzo Yuste, 2015.

[30] Eighteenth century confreres of Hezel, such as Juan José Delgado (1697-1755) and Pedro Murillo Velarde (1696-1753), included ethnographic, historic and ethnobotanic data on the Marianas archipelago in their treatises on Philippine history. Near the end of the nineteenth century, Pablo Pastells, SJ (1846-1932) gathered 116 notebooks of Philippine natural and social history—included in the Pastells Collection—that also contained information on the Marianas. One of his assistants, Antonio Astrain, S.J., used these sources to write his monumental *Historia de la Compañía de Jesús en la asistencia de España* (Madrid, 1902-25). See also Arcilla Solero, vol. 2, 1989, pp. 377-96. The recent dissertation of Descalzo Yuste (2015) has filled the void that Horacio de la Costa left regarding the Jesuit

CHamoru communities openly opposed the Jesuits' evangelizing project because they tried to impose gendered practices and discourses through the transformation of native space and architectural structures. These ethno-sexual conflicts, understood as "the clash between incompatible beliefs and practices related to sexuality", are articulated around constructed spaces, or materialities, considered sinful: the "public bachelor's house" (2016, pp. 229-232; 2020, pp. 50-51). Similarly, Montón (2019, pp. 404-29) explores the early years of the far-flung Jesuit missions in Guåhån to describe how their global policy of evangelization was not only about the expansion, conquest and colonization initiated by Spain, but also a desire to globally propagate a certain ideology and policy around sexuality.

In this way, the missionaries imposed a patriarchal system within indigenous society in an attempt to dismantle the native ways of life in the Marianas. Finally, Strasser's last book raises interesting questions. Drawing heavily from gender studies, she wonders how a remote archipelago in the margins of the Spanish overseas empire turned into a magnet of desire for Spanish and foreign Jesuits, particularly Germans, in the late 17th century. The novelty of her book is the way she links gender history to world or global history in the early modern period. Jesuit missions and missionaries were coded as masculine on Iberian domains where men were seemingly the only actors on stage. However, while patriarchal dynamics marked Jesuit history from the very beginning, missionaries were shaped by gender in different yet allegedly contradictory ways. Emotions (or more accurately, passions), are part and parcel of this study of Jesuit masculinities. As Barbara Rosenwein put it, the Jesuit order was an "emotional community" that gave free reign to stirring emotions and desires for action (Strasser, 2020, p. 31). Missionary men inspired other novices to imitate – *imitatio* – their illustrious forefathers as well as those Jesuit exemplars who died as martyrs of the Catholic faith on the distant missions. Male mimesis facilitated the Society's extraordinary expansion across the early modern world, allowing for new forms of action by working the human passions (Strasser, 2020, p. 32).

In the last fifty years, the output of scholarly analyses on the Jesuit evangelization of the Mariana Islands has focused primarily on the intertwined history of the colonial Church and the Crown, and attention has been paid to emerging hostilities, particularly those related to military participation; the mutinies of the soldiers stationed in the Guåhan presidio (Mawson, 2015, pp. 128–48; Mawson, 2016, pp. 87-125); and the demographic decline that prompted the resettlement of the remaining CHamoru inhabitants of the eight northern Mariana Islands into various parishes/reductions in 1699.

The recently deceased historian Marjorie G. Driver (University of Guam and Micronesian Area Research Center) wrote key monographic texts on the colonial administration of the Marianas. Undergirded by her solid academic background and a personal knowledge of the Hispanic world, thanks to her stays in Puerto Rico, Marjorie G. Driver's work was a touchstone in the studies on the history and culture of Guåhan.

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evangelization of the Marianas, basing his work mainly on research carried out by Alexandre Coello de la Rosa.

Her first monograph, *El Palacio: The Spanish Palace in Agaña; A Chronology of Men and Events, 1668–1899*, published in 1984, looked at the political history of Guåhan during its 230 years under Spanish administration. In her second monograph, *Cross, Sword, and Silver: The Nascent Spanish Colony in the Mariana Islands* (1987), Driver analyzed the archipelago's dependence on the royal *situado* during the administration of Governor Damián de Esplana (1674-94). Driver showed that the Marianas were a sort of technical stop in the galleon route between Manila and Acapulco, which, due to scant attention from the Spanish Crown, created opportunities for corrupt officials such as Esplana, who generated a profitable contraband trade with the collaboration of Mexican warehouse owners.[31] This enterprise necessitated the forced involvement of native labor, which led to conflicts between the governor and other officials and the Jesuit missionaries, who opposed such practices.[32]

Jesuit historian Francis X. Hezel, former director of the Micronesian Seminar, a non-profit non-governmental organization seated in Pohnpei (Senyavin Islands), also dedicated much of his intellectual work to examining the dual process of Spanish colonialism and evangelization of the Mariana Islands. In his first text, "From Conversion to Conquest: The Early Spanish Mission in the Marianas" (1982), Hezel rejected the Manichaean theses of Laura Thompson (1945) regarding the genocide perpetrated against the CHamoru people by Spanish soldiers and the heads of the "Spanish Catholic regime".[33] Hezel's second work, "From Conquest to Colonization: Spain in the Mariana Islands, 1690 to 1740" (1988), coauthored with Marjorie C. Driver, looked at the second stage of Spanish colonization in the archipelago, which had been less studied by historians. In 2015 Hezel published a text that complements his first monograph, "From Conversion to Conquest…", under the name *When Cultures Clash: Revisiting the "Spanish-Chamorro Wars"* (2015, p. 10), and which practically restates his initial conclusion, that the scourge of imported diseases was the main cause for the dramatic population decline of the CHamoru. Thus, while Hezel continued to regard the intermittent outbreaks of violence known as the Spanish-CHamoru Wars (1671–72; 1684; 1690) as of secondary importance, other scholars have gone so far as to describe these armed clashes as genuine "civil war" (Dixon, Jalandoni and Craft, 2017, p. 197).

Some other historians have underlined the difficulties and adaptations that went with the construction of imperial hegemonies in intercultural contexts. The work of Augusto V. de Viana (2004; 2005) in particular argued, with compelling evidence, that the Spanish colonial empire could not have been constructed without the effective collaboration and participation of the Philippine's native peoples, the Tagalogs, Visayans, and especially, the Pampanga soldiers of Macabebe. The same goes for some CHamorus, including chiefs Don Andrés de la Cruz, Don Ignacio de Hineti (or

[31] On Mexican participation in the exploitation of the Marianas, see Yuste López, 1984; Yuste López, 2007.

[32] Other historians have unearthed reports and text written by passengers and/or crewmembers of the ships, Spanish and otherwise, that periodically stopped at the Marianas, and which provided interesting descriptions of CHamoru life and customs. See especially, Barratt 2003.

[33] An important and well-read history that adopted Laura Thompson's genocide thesis rather uncritically, was Carano and Sanchez, 1964, p. 86.

Hinesi) and Don Antonio de Ayihi, who collaborated with the Jesuits in the mission's consolidation (De Viana, 2004, pp. 19–26; De Viana, 2004; De Viana, 2005, p. 16; Coello de la Rosa, 2019). These essential allies not only served and assisted the Spanish administration but also acted as effective soldiers and officers of the mission. The Spanish would not have been able to defeat CHamoru resistance without native CHamoru soldiers, who joined the mission's armed contingent, which, for its part, had more soldiers of Philippine than of European origin. Native soldiers were more readily adapted to the terrain and served as valuable interpreters and mediators, both necessary elements that proved vital for the conquest and colonization of the islands. The experiences and history of the soldiers themselves—most of them conscripts and former convicts—have also been addressed in the new historiography, with Stephanie Mawson (2015) specifically looking at the mutinies carried out by the soldiers stationed at the Guåhan presidio in 1680, and their loyalty and commitment to the construction of the Spanish empire in the Pacific (Mawson, 2015, pp. 128–48; Mawson, 2016, pp. 87-125).

Until the present, work on the Marianas has benefited from the *History of Micronesia* edited by Rodrigue Lévesque (1992). An encyclopedic series that spans the period between the sixteenth and eighteenth centuries, it contains a wealth of information on the diverse islands of the Pacific. The series transcribes a selection of documents from the main archives and libraries of Europe and the Americas, and despite some notorious mistranslations, it is an inestimable source for scholars interested in any aspect of the islands' histories.[34] It is comprised of reports (or *relaciones*), royal decrees, and maps, as well as extracts of the Annual Letters (*Cartas Anuas*) written by the Society of Jesus' superiors, which include reports on the activities carried out by each Jesuit under his jurisdiction during the previous year. Most of these letters, written in Latin or in the superiors' vernacular languages, are vital chronicles of events that historians can mine for invaluable demographic, economic and religious information on the missions administered by the Society in Micronesia. They are also valuable for cultural and anthropological studies, containing as they do information on the ancient CHamoru.

In line with arguments developed by Michael Lujan Bevacqua,[35] anthropologist David Atienza rejects the premise that the "pure" CHamoru of the pre-Hispanic period ceased to exist, and he questions the notion that a "Spanish genocide" orchestrated through the so-called Spanish-CHamoru wars practically eliminated the native population, and that a new, mixed, neo-CHamoru people was formed by the mix of the few remaining natives and settlers from Spanish America, Tagalogs and Pampangans from the Philippines (Hezel, 2015, p. 10; Tueller, 2014, pp. 97-118). Atienza argues that both Francis X. Hezel's thesis of "the fatal impact of the West upon a defenseless island society" (2015, p. 9), as well as Enrique Moral's thesis of "biopolitics as a system of population control" (2016, p. 231) eclipse the capacity of the CHamoru to act as agents

[34] David Atienza, "Lost in Translation, or the Art of Rewriting History?" http://www.aganaarch.org/blessed-diego-luis-de-san-vitores/.

[35] Lujan Bevacqua, 2020. Retrieved from http://guampedia.com/transmission-of-christianity-into-chamorro-culture/ (last visited 2 October 2020).

in their own history, especially regarding their appropriation of the Jesuits' evangelical message and the production and reproduction of an entirely CHamoru cultural experience (Atienza de Frutos, 2013, p. 2; Hezel, 2015, pp. 9–10).

Vicente M. Díaz y Anne P. Hattori have also critiqued the canonical visions of the past, such as that expressed in Robert F. Rogers *Destiny's Landfall* (1995), which deny the CHamoru the possibility of acting in the (re)construction of their own history (Hattori, 1997, pp. 275–77, Diaz, 1996, pp. 179–99). Colonialization is an ambivalent, conflictive, fluid process that involves appropriation, cultural borrowing, and effective resistance on the part of the colonized, who, far from disappearing, have, in the CHamoru case, continued exercising an active role in the defense of their culture and traditions (Diaz, 2010, pp. 8; 116).[36]

In several works, Ulrike Strasser (2015, p. 570; 2020, pp. 113-146) has argued that, like a new "Francisco Javier", Father San Vitores regarded the Marianas as a feminine space that invited "the masculine project of planting the seed of Christ by becoming a martyr of faith". Other historians, such as James B. Tueller, argued that new social networks of conversion were gradually creating and solidifing between the newcomers and the CHamoru, paving the way for the Christianization of the native population. As conversion to Christianity occurred in the surrounding social world, the religious changes of the early modern CHamoru should be best understood in the context of the social networks among all the inhabitants of the Mariana Islands (Tueller, 2001, pp. 385-394; Tueller, 2009, pp. 333-60).

In the long run, Catholicism became a central element of CHamoru identity, and San Vitores turned into a local saint and is regarded as the official founder of the Marianas mission (Diaz, 2010). It can thus be argued that CHamoru cultural patterns not only survived the arrival of the Spanish colonizers, but that they were intertwined with the new Christian codes and symbols, which CHamoru syncretism adapted and reinterpreted as a way to preserve local customs and traditions (Diaz, 1993; Diaz, 1995, pp. 159–71; Tueller, 2009, pp. 333-60; Diaz, 2010. See also Atienza and Coello, 2012, pp. 459–73).

A large number of scholars who work on different aspects of global evangelization, such as Charlotte de Castelnau-L'Estoile, Michela Catto, Guido Mongini, Silvia Mostaccio, Marie-Lucie Copete, Aliocha Maldavsky, Inés G. Županov, Guillermo Wilde and Alexandre Coello, have paved the way for the analysis of modern missions not only as key elements in the occupation system of frontier territories (García de los Arcos, 2011, pp. 47–69), but as the links in a chain of circulation of (missional) knowledge (Catto, Mongini and Mostaccio, 2010, pp. 1–16; Castelnau-L'Estoile, Copete, Maldavsky, and Županov (eds.), 2011, pp. 1–22; Wilde, 2012, pp. 15–27).

[36] In 2010, 69.098 people identified as CHamoru in Guam, or 43,36 % of the island's population. In the Northern Marianas, there were 17.510 self-identified CHamoru, or 32,49 % of the population. The majority speaks the CHamoru language, but even for those who no longer do so, it has "a clearly identitarian, sentimental, and symbolic value within their ethnic community and even in relation to the entire population of the islands" (Rodríguez-Ponga, 2019, p. 42).

Similarly, Ulrike Strasser's last book confirmed the participation of German Jesuits in the evangelization of the Spanish Pacific (Strasser, 2020, pp. 147-180). In 1946, Lazaro de Aspurz, O.F.M.'s classic book, *La aportación extranjera a las misiones españolas del Patronato Regio* (Madrid, 1946), had already outlined the contribution of foreign missionaries, especially from German-speaking lands of Central Europe, in the Spanish missions. In this vein, Czech historians, including Pavel Zavadil, Pavel Fochler, Simona Binková and Markéta Křížová, among others, had also traced the participation of Czech, Moravian and Silesian missionaries who went to the Marianas from the province of Bohemia. Starting in the eighteenth century, the scarcity of missionaries forced the Bourbon dynasty to lift the prohibitions set by the Hapsburgs regarding the presence of foreign Jesuits in the Americas and the Philippines, and the number of German missionaries was particularly significant (Zavadil, 2012; Binková, Křížová, et al., 2016; Fochler, 2016, pp. 195–213). The missionary vocation should not be reduced to a simple desire to move to a faraway place ("the Indies"), but as a pastoral strategy that encouraged Jesuits of all nationalities to forge a consciousness of themselves through the diffusion of their apostolic ideas across the world as active agents of a religion with a global projection (Fabre and Vincent, 2007, pp. 1–2).[37]

The frameworks for the comparative study of sociocultural change facilitate its comprehension (Spoehr, 1978, p. 259), but the limits of the "cultural dialogue" established between Christian universalism, on the one hand, and the local contexts with their cultural and natural diversity, on the other, can only be established by close examinations of case-studies that can reveal the distance or closeness between the objects of the missionaries and the results obtained (Rubiés, 2005, p. 242). This is what Alexandre Coello does in his monograph, *Jesuits at the Margins* (2016), which studies the complexities of Jesuit missionary activity in Guåhan and the Marianas as part of the abovementioned renovated historiography that addressed the first Catholic missions in the Pacific. Besides the activity and history of the mission itself, Coello addresses two major topics: the transoceanic relations of the archipelago and the viceroyalty of New Spain, which included the Philippines; and native agency and the relations of resistance and adaptation that they engaged vis-à-vis the missionaries, constructing new identities.

While the canonical Jesuit historiography has accepted the narratives of the Marianas' conquest and evangelization, Coello adopts the theoretical framework developed by historians Charlotte de Castelnau-L'Estoile, Marie-Lucie Copete, Aliocha Maldavsky, Luke Clossey, and Inés G. Županov (2011), in which the Society of Jesus is seen as a vanguard within a context of production and diffusion of missionary knowledge at a global scale (Clossey, 2008; Martínez Serna, 2009, p. 189). Indeed, the Society of Jesus was not simply an ideological weapon at the service of the Spanish empire (Ross Wiecko, 2013). Jesuits were also agents of the evangelization of the Pacific, who accumulated, produced and received information that traveled through a broad network of procurators in a multinational empire.

[37] On the particular matter of the forging of the self that emerged in the modern Catholicism' missionary expansion, see also Molina, 2013.

The CHamoru were also more than mere victims of evil colonizers led by priests who were obsessed with turning them into obedient and pious subjects of the Spanish Crown. In his 2016 article, CHamoru scholar Perez Viernes staunchly defended *maga'låhi* Hurao's famous speech, which was delivered during the first CHamoru rebellion in 1671, as an example of indigenous resistance and agency. Indeed, this was neither historical speculation nor a myth because it really took place. It is worth remembering that the CHamoru were not the only native group that proved gifted in oratory. In the Paraguayan *reducciones* and southern Chilean missions, Jesuits also considered Guaranies and Mapuches huilliches respectively as fine and eloquent orators (Payás, 2018). In contrast to the interpretations of those European scholars (Coello, Rubiés) who defend the rhetoric (Jesuit) character of Hurao's speech, Perez Viernes argues that their dismissal of native agency obscures Hurao's actual leadership. But this scholarship does not deny Hurao's, Hula's [or Yura], Agua'lin's [or Aguarín] capacity to mobilize their fellow islanders in the thousands to confront the Spaniards. It does, however, emphasize Hurao's speech as Jesuit propaganda to justify Western conquest and evangelization.

CHamoru historiography has acknowledged that the indigenous historical experience and native agency transcend what has been represented in Eurocentric histories and apologetic interpretations of the colonial past.[38] In so doing, Perez Viernes' 2016 article laid the foundations of the national heroes of the Marianas. When delivering his speech, Hurao, transmuted into a national archetype, not only "inspired the masses", Perez contends, but also "contributed to the making of his people's history" (Perez Viernes, 2016, p. 126). As he often reminds us, Hurao will be a source of inspiration for the future generations, thereby turning him into an icon of CHamorro identity. One thing is certain: the words he uttered are lost in translation, so that it is impossible to know what he once said. Nonetheless, it is evident that what Jesuit missionaries recorded in Guåhån had nothing to do with Hurao's own wording because that "way of uttering" was instead a beautifully crafted exercise of Jesuit "rhetoric".

The Jesuits in Guåhan also discovered the CHamoru's ritualized forms of artistic expression, such as music and dance. In a recent text, David R. M. Irving analyzes music as a mediating element through which the missionaries tried to "transform the hearts" of the CHamoru people. Festivities and civic-religious celebrations "combined elements from indigenous CHamoru culture (theatrical performances, poetry, and singing in the CHamoru language) with Spanish plays and Mexican dances" (Irving, 2019, p. 229). The introduction of new styles, dances, and musical instruments (clarions, hornpipes, bagpipes, drums, lyres) brought over from Europe, Mexico, and the Philippines, was used as an evangelization strategy that had a significant impact on CHamoru musical culture. On the other hand, the incorporation of local musicians in liturgy and post-mortem rituals, which was recorded by nineteenth century travelers such as Jacques Arago (1790-1855) and Louis de Freycinet (1779-1841), evidenced how Guåhan "became a unique microcosm of cultural exchange, bringing Spanish,

[38] Faced with an image of apparent inaction and passivity of native women, which blurs and subordinates their agency, see the work of Teaiwa, 1992.

Mexican, and African elements into dialogue with Micronesian musical culture" (Irving, 2019, p. 232).

To conclude, the methodologically creative dissertation by Verónica Peña Filiu, *Alimentación y colonialismo en las islas,* defended in Universitat Pompeu Fabra in 2020, combines written and archaeological sources to analyze the changes and continuities that were produced in the diet of the Marianas' inhabitants during the Jesuit period (1668-1769). Historians Rebecca Earle (2014), Trudy Eden (2008) and Heather Martel (2011; 2012) had already argued about the centrality of food in the first European colonial expansion. The process of evangelizing and occupying the archipelago entailed the introduction of cattle raising and new methods of agriculture, carried out in small ranches—known as *lanchos* (or *lanchus*)—to produce new foodstuffs (wheat, grapes, legumes, beef, pork). Changes in dietary and culinary practices were multidirectional, however, with local, Iberian and American foods comprising the fare of the archipelago's inhabitants (Peña Filiu, 2019).

Final Remarks

The present work is a historiographical overview on the first modern Catholic missions established in the Mariana Islands. From the pioneering texts of Marjorie G. Driver and Franz X. Hezel, historians, archaeologists, and anthropologists have studied the Jesuit missions not as a complement of Western imperialism, but as a privileged field to understand intercultural encounters. In a system of territorial frontier occupation, recent studies have emphasized aspects related with the martyrial phenomenon, confessionalization, military uprisings, and cultural transformations in the post-contact period. Standing against the essentialist theses that question the "native" character of today's CHamoru, several scholars challenge the supposed disappearance of this native people and argue instead for their cultural continuity. Not surprisingly, Carolina Fernández argues that "the islanders' religious practices are similarly a blend of cultures: they are intensely marked by the Catholicism brought by the Jesuits in the seventeenth century, but not fully detached from CHamoru spirituality" (Fernández Rodríguez, 2019, pp. 1-21).

Finally, this essay is a small homage to Marjorie G. Driver, who pioneered the study of the Spanish presence in Micronesia in the field of colonial studies. She was one of the cofounders of the Micronesian Area Research Center (MARC) in 1967, and left us on the 20th of September of 2019, at the age of 95.[39] Her work, as reflected in this text, is still a key reference for any scholar who wishes to study the colonial past of Guåhån and the Mariana Islands.

[39] "Friday Memorial Service for MARC Founding Member Marjorie G. Driver". Retrieved from https://eu.guampdn.com/story/news/local/2019/09/30/marc-founding-member-marjorie-driver-university-guam/3816725002/ (last visited 2 October 2020).

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Using Island Wisdom to Build Our Future

Mary Therese Flores Cruz
University of Guam

What does Pacific Island/Oceanic wisdom mean to you?

Pacific Island wisdom exists within the peoples of the Pacific and the connections that they make within and among their communities. Pacific Island wisdom centers the production of knowledge on the epistemologies of indigenous peoples throughout the Pacific. These epistemologies not only inform but also guide all areas of learning and research from within these Pacific communities. In the endeavor to promote Pacific island wisdom, it is imperative that we do not see this as a mere tool of research but for its inherent value in preserving, sustaining, and building our peoples and communities.

How/why do you bring island wisdom into your scholarship?

As academics, we have a responsibility to use Island wisdom to the benefit of our Island. In the classroom, this begins with using knowledge from our communities and others like ours to ground what and how we teach future generations. Allowing our students to be key participants in the exchange of ideas is vital to learning because their diverse experiences contribute to growing our understanding of our communities. In scholarship, Island wisdom provides the foundation for the what, why and how of all research. Island wisdom informs all aspects of this endeavor so that it can also be used to inform others.

Agroforestry in the Climate of the Marshall Islands (*Green Dashboard*): An Interactive Website.[1]

Harley I. Manner
University of Guam

Kathleen S. Friday
USDA Forest Services
Hilo, Hawai'i

Maria Haws
University of Hawai'i at Hilo

Lajikit Rufus
Ministry of Natural Resources and Commerce
Republic of the Marshall Islands

Abstract

An interactive website, *Agroforestry in the Climate of the Marshall Islands* (*or Green Dashboard*), was developed in response to requests from Marshall Island public agencies and stakeholders. The purpose of this website is to provide easily accessible decision-making tools for government officials, public agencies, and citizens striving to mitigate the impacts of climate change and sea level rise that are affecting their coasts, agroforestry systems, and resources. The agroforestry information for the website is based on literature reviews, surveys, and interviews of Marshall Islanders regarding their understanding of their traditional agriculture and environment. The surveys were conducted in 2015-2016 on Majuro and Arno atolls. The website information is presented in both English and Marshallese. The website includes climate information in simple language, using terminology consistent with that used by meteorologists advising the Marshall Islands, and drawing from monthly data presented in scientific detail on the University of Hawai'i's *Blue Dashboard* for the Marshall Islands. The relationship and interfaces of the two dashboards, and the protocols for developing and maintaining the website, are also presented.

Keywords: climate change, sea level rise, Marshall Islands, dashboard

Introduction

With respect to global climate change and sea level rise, in the last three decades, the Marshall Islands have experienced at least five El Niño driven droughts and annual saltwater flooding of coastal lands during abnormally high tides or storms, and since 1993, a sea level rise of approximately 0.3 inches per year (Australian Bureau

[1] This work was supported by USGS Climate Science Agreement No. G14AP00184 entitled "Vegetative Guide Dashboard: Relating traditional atoll agroforestry recommendations to predicted climate and sea level conditions in the Marshall Islands." The grant was awarded to the Pacific Aquaculture and Coastal Resources Center at the University of Hawai'i, Hilo in 2014. Correspondence concerning the article should be addressed to Harley I. Manner, 12 Anamuli Street, Kahului, HI 96732.

of Meteorology [ABM] and Commonwealth Scientific Industrial Research Organization [CSIRO], 2014). Higher rates of beach erosion and flooding during high tides, and storm surges superimposed on heightened sea levels have eroded, destabilized, and modified coastal topographies, and salinized soils and groundwater. As most of the islands are small, low-lying and have poor ground water resources, these events have seriously impacted their physical geography and in particular, their agricultural sustainability. A recent scenario by the U.S. Global Change Research Program (Reidmiller et al., 2018) suggests a sea level rise of 1 foot by 2050, 4 feet by 2100, and El Niño-Southern Oscillation (ENSO) impacts 2 times stronger in the next century than the present. Such studies call into question how long low-lying atoll environments will be habitable under such conditions and address a wide range of mitigation and adaptation measures to consider.

Following the 2013 drought in the Marshall Islands, government officials, agroforestry extension agents and stakeholders sought information about whether the drought and other extreme events should be interpreted as the result of climate change or natural variation, and how to plan for and respond to them. Agroforestry practitioners and their extension agents sought information about suitable species and cultivars to plant after the drought ended in order to respond to anticipated future severe drought conditions (Haws, 2018). Stakeholders also wanted seasonal outlooks about sea level as affected by daily tides, ENSO, probabilities of storms and other disturbances, and information on appropriate species in order to guide the timing and location of restoration of coastal vegetation. At least one government erosion control planting of coastal trees and shrubs was washed away by a "king" tide before the plants were well-established, indicating a need to plan around tidal and ENSO-related variations in sea level.

In response to this and related concerns, the authors and associates developed an interactive website called *Agroforestry in the Climate of the Marshall Islands,* or *Green Dashboard* (Friday,, 2017).[2] This website provides agroforestry extension agents and community leaders with information about seasonal and long-term changes in climate, and the steps that Marshall Islanders can take to mitigate the short and long-term impacts of global climate change and sea level rise on their agriculture/agroforestry systems. The project primarily focused on climate conditions within a planning horizon of 40 years, which corresponds to the productive lifespan of newly planted coconut and other perennial trees that are the framework of traditional agroforestry in the Marshalls. Various tree species in the Marshalls begin to provide nutritious leaves and fruit beginning within as few as 2-5 years; 40 years represents the

[2] The *Green Dashboard* is a companion to the *Marshall Islands Climate Outlook (Blue Dashboard)* which provides information about oceanic and atmospheric conditions. Recent and forecast conditions are updated monthly for temperature, rainfall, storms, sea level and waves, ocean conditions, and ENSO (El Niño, La Niña) indices. It is an ongoing collaboration between the Asia-Pacific Data Research Center (APDRC) and the NOAA Climate Information System (PaCIS). Information on the website and its development is discussed in the latter half of this paper. The website is accessible at: http://oos.soest.hawaii.edu/pacific-rcc/Marshalls%20Agroforestry/site/index.php.

opportunity for the present generation to provide for their children and grandchildren. This focus is similar to that of an engineer who specifies the design timeframe of a building or road that has a long but not unlimited useful life. Beyond this timeframe, there are many uncertainties based on future decisions and actions affecting greenhouse gas emissions, and uncertainties in scientific models of the responses of the world's ecosystems; it is not possible or necessary to resolve those uncertainties to make agroforestry recommendations for the next few decades. Even if people begin to emigrate within that timeframe, they are better positioned for success if they have been well-nourished.

This paper presents information on the *Green Dashboard* and its interactive agricultural calendar. It is presented in this journal because of its social, existential, and interdisciplinary relevance to all Pacific islands.

The methods used for this paper included a literature review, three survey questionnaires, and interviews of Marshall Islanders on topics about their knowledge of traditional knowledge (e.g., agricultural practices, cultivated food plants, and the seasonality of Marshallese weather and climate).[3] The survey questions were translated into Marshallese by the language and culture faculty at the College of the Marshall Islands and other Marshall Islanders. The questions and interviews were administered in Marshallese by Marshall Islanders affiliated with the project. The questionnaires were given to 39 people, of which 65% + were residents of Arno, an atoll in the eastern island chain, and the rest, residents of Majuro, the capitol and atoll in the eastern island chain, who migrated there from the other atolls of the country. The respondents' answers to the questions were filled out by the interviewer. The interviews began on Arno Atoll on April 27, 2015 and ended in mid-December 2015 on Majuro Atoll. Fourteen of the 39 respondents were asked to fill out a form which listed salt and drought tolerant plants by their scientific and Marshallese names. The number of respondents for each survey form and questionnaire may be considered adequate if each respondent is considered a case study, or if the sample is deemed a sufficient basis for a more in-depth analysis involving a larger sample size. We feel that the numbers of respondents are more than enough to give us a good idea of Marshallese understanding of the topics listed above.

This paper also summarizes the climate and meteorological sources based upon which the authors developed public education graphics and tables for the website. While such graphics are necessarily simplifications and incomplete models, it is important to document their foundations and acknowledge the gaps therein.

A Brief Geographic Sketch of the Marshall Islands

Physical Geography

The Republic of the Marshall Islands (RMI) consists of 29 low-lying atolls and 5 upraised limestone islands located in the Central Pacific Ocean between 4.5° N and

[3] A more extensive discussion of these questionnaires and their results are presented in Manner et al. (2017) and Haws (2018).

15° N latitude and 160° E and 170° E (Figure 1). The atolls are arranged in two NW to SE trending chains: *Ratak* on the east and *Ralik* towards the west. The total dry land area of the country measures only 69.84 mi^2 (110 km^2) (Bryan, Jr., 1971), with 98% of the area distributed over 1200 islets averaging 0.057 mi^2 (0.15 km^2) per islet. As an example of this fragmentation, Majuro Atoll, which consists of 64 islets, has a total dry land area of 3.54 mi^2 (9.17 km^2) for an average of 0.05 mi^2 (0.13 km^2) per islet (Bryan, Jr., 1971). The total land area of the upraised islands measures only 1.66 mi^2 (4.30 km^2), with Mejit - the largest island - measuring 0.72 mi^2 (1.86 km^2) in area. As a consequence of their small size, ground water lenses and other agricultural resources are limited in quality and quantity. Because these islets average only 2 m in elevation, they are subject to saltwater storm wave flooding during high tides. By contrast, the lagoon area measures 4,037 mi^2 (6,511 km^2) and the Republic's EEZ (Exclusive Economic Zone) occupies an oceanic area of 750,000 mi^2 (1.2 million km^2) (Crawford, 1993).

Population and its Distribution

According to the 2011 census, the population of the Marshall Islands numbered 53,158 people in 2011, of which 27,797 resided on Majuro; 11,408 on Kwajalein; and 13,953 on the other atolls (Republic of the Marshall Islands [RMI] & Secretariat for the Pacific Community [SPC], 2012). Both Majuro and Kwajalein have experienced positive net migration from the other atolls as Majuro is the center of government and trade while Kwajalein offers employment as a US missile testing site. The Marshallese workforce for Kwajalein lives on Ebeye Islet which has a population of 9,614 people and a population density of 80117/mi^2 (31,013 km^2) (Republic of Marshall Islands, 2012). Majuro's population density is less at 7413/mi^2 (2,860/km^2). The current rate of population growth for the Republic is low, at 0.4% per year; the result of large out-migration to the United States and its territories. This has been made possible by the Compact of Free Association, an agreement made between the Marshall Islands and the United States at the end of the United Nations Trust Territory agreement created at the end of World War II.

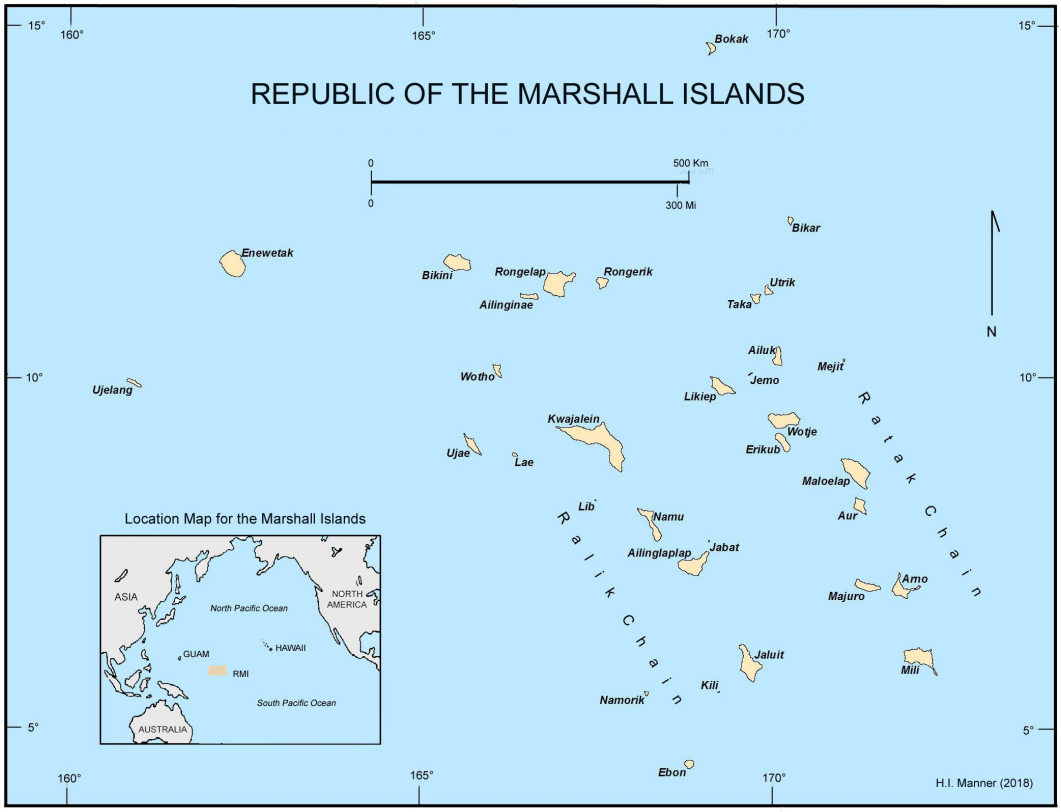


Figure 1. Location map of the Marshall Islands (Cartography by H.I. Manner 2018).

Weather and Climate

By virtue of its latitudinal position in the Central Pacific Ocean and its location relative to the Intertropical Convergence Zone (ITCZ) and the NE trade winds, the climate of the Marshall Islands ranges from a *Köppen Aw* (tropical winter dry climate) and/or *BSh* (hot, semi-arid climate) in the northern atolls such as Taongi and Bikar to *Af* (tropical rainforest climate) in the central and southern atolls of Majuro and Jaluit. Thus, a noted feature of the Marshall Islands is a gradient of increasing rainfall as one progresses from the northern to southern atolls (Thomas et al., 1989; Stoddart & Walsh, 1992). As an example, the annual rainfall, in the absence of records for Taongi Atoll, "…is likely to be in the range of 30-40 in (750-1,000 mm), comparable to that recorded for wake island (sic) located some 300 m (500 km) to the north" (Thomas et al., 1989:10). In contrast, that of Majuro and Jaluit are in excess of 100 in (2,540 mm) per annum (Mueller-Dombois & Fosberg, 1998). The distribution of precipitation is not even, particularly in the more northern atolls where lower amounts are recorded for the months of January to March and the higher totals are recorded for July to September. The lower precipitation totals are directly related to the cooler, more stable air of the NE trades of the Hawaiian High (a subtropical high-pressure cell) that dominates during this period. The greater precipitation of summer and late summer is directly linked to the variable winds and unstable air of the Intertropical Convergence Zone, which

migrates northward during the northern hemisphere summer. In terms of temperature, all locations are warm with average annual temperatures in the low 80°F range (27-28°C). At Majuro, the annual temperature average is 81.4°F (27.4°C), with little variation between the warmest and coldest months (0.6°F) (~0.3°C), while at Wake the average annual temperature is 81.2°F (27.3°C), but with a higher monthly variation (4.9°F) (2.7°C). The Marshallese refer to the cooler dry period as *Añōneañ* and the warmer moister period as *Rak*.

Drought, as a part of an El Niño event is a serious factor relative to the environmental and economic well-being of the Marshall Islands. In the past three decades, the Marshall Islands experienced droughts in 1982-83 (Reti, 2008); 1992, 1997-98 (Anthony, 2012); and 2013, 2015-16 (Leenders et al., 2017). Drought is not restricted to just the drier northern atolls. In the 1997-98 drought, Majuro received only 8% of its normal rainfall between January and April 1998 (Anthony, 2012).

Climate Change and Sea Level Rise Impacts

Various studies on the future of agriculture and fisheries in the Pacific Islands suggest that climate change and sea-level rise are expected to exacerbate the problems of food access and security (Asian Development Bank [ADB], 2011, 2013; Food and Agriculture Organization [FAO], 2008; Sharma, 2006; Bell & Taylor, 2015; Bell et al., 2016). Rapid population growth, urbanization, the shortage of arable land for agriculture, limited income earning opportunities, financial constraints, and the availability of cheap low quality food imports constitute some of the contributing factors. The ADB (2011) and the ABM & CSIRO (2014) climate change scenarios for the Marshall Islands have posited an increase in severe droughts and a host of weather and sea level changes that are predicted to have a negative impact on the quality of the islands' vegetation, soil, and water resources. The latter group states that for the Marshall Islands, the natural cycle of La Niña and El Niño events (storms, rain and drought, sea level) will be more noticeable than climate change during those next 40 years. Specifically:

1. Rainfall has been on a downward trend in the Marshalls, but most models predict it will increase in the future. Within just the next 40 years, any changes as a result of climate change will not be very noticeable compared to the natural variability of rainfall in the Marshalls, especially as a result of the ENSO cycle.
2. Average, minimum, and maximum air temperatures will all probably increase by about 1.5-2.2 degrees Centigrade (2.7-4.0 degrees Fahrenheit), with most of the increase in the latter decades under the least favorable emissions scenarios. This will affect evapotranspiration and stress on crops, but because the models predict increases in rainfall, the net effect on freshwater stress in the Marshall Islands from changes in temperature and rainfall alone over the next 40 years is negligible (Karnauskas et al., 2016).
3. Changes in the frequency of droughts and storms in the next 40 years in the Marshalls will also probably be a result of ENSO instead of climate change.

4. Worldwide sea levels are now rising at least 0.3 inches/year and will probably rise at least 13 inches within 40 years. In addition, sea levels may temporarily rise by 12 inches during a La Nina and drop by 5 inches during an El Nino event in the Marshalls. Sea level rise is also added to the effect of each king tide and storm surge, making inundation events more frequent.

After the project began, Storlazzi et al. (2018), working on Roi Namur Island, Kwajalein Atoll, in the western (Ralik) island chain, found that wave dynamics over less-shallow reef flats amplify the effects of sea level rise, leading to more severe flooding. He predicted this could result in the islands becoming uninhabitable by mid-century because of frequent damage to infrastructure and the inability of their freshwater aquifers to recover between *overwash* events. While their findings have had a demoralizing effect upon project partners, it has also been criticized. Kopp (2018), for example, is critical of Storlazzi et al.'s conclusions because the scenarios of sea level rise flooding they used were "intended as tools for risk management, not as forecasts of what would be likely under different emissions scenarios." McSweeney (2018) notes that there are atolls with contaminated ground water resources but are populated because they have alternate sources of fresh water.

Elsewhere, analysis of remotely sensed data of Tuvalu atolls by Kench et al. (2018) which showed a net increase in land area in eight of nine atolls over the past four decades despite sea level rise, indicate that atolls are not static landforms, but are "geologically dynamic features that will adjust to changing sea level and climatic conditions." In an interview with *CarbonBrief* (McSweeney (2018), Kench said that Roi Namur had been substantially modified by construction and was therefore "representative of a very limited number of atoll islands". Furthermore, in contrast to Storlazzi's study of one island, Kench's analysis of all of Tuvalu's atolls offer "a nuanced set of options to be explored to support adaptation in atoll states" rather than the "narratives of environmentally determined exodus," and "persistent messages" which "have normalised island loss and undermined robust and sustainable adaptive planning in small island nations" (Kench et al., 2018).

While climate change caused migration is a much-discussed strategy amongst international organizations and the news media [4] (see for example, Yamamoto and Esteban, 2017; Barnett and O'Neill, 2012), few Marshallese consider it to be a viable alternative at this time. A survey of 199 households on Majuro, Maloelap, and Mejit Island in the Marshall Islands and 79 households Hawai'i, Oregon, and Washington by van der Geest et al. (2019, 2020) showed that education, health care, work, and family connections (visits) were the main drivers for migration; climate change and sea level rise were "not yet common reasons for which people migrate but rather something that might spur migration in the future." (van der Geest et al., 2020:119). Respondents living in the RMI ranked the lack of job opportunities (1), drought (2), the lack of fresh water (3) and sea-level rise (4) as major problems, and one half of these respondents

[4] Between 2000 and 2011, climate change coverage appeared in 249 out of 626 issues of *The Marshall Islands Journal* (Rudiak-Gould, 2013: 43).

perceived a "general negative trend in ecosystem services (the provision of local food and access to freshwater, fuelwood, and safety)." (van der Geest et al., 2019:7). In an earlier study about how Marshall Islanders receive climate change information, Rudiak-Gould (2013: 43) wrote that for residents of Majuro, environmental changes (changes in climate, changes in the ocean, "climate change," and "global warming" ranked fifth of 13 concerns. More important concerns were social, economic, and cultural, for example, population growth and overcrowding, and changing lifestyles and mores, to name a few. According to Rudiak-Gould, the Marshallese reject climate change caused exodus as such migration would mean a loss of the homeland and Marshallese culture.

Climatic Components Used in Defining the Dashboard Levels and the Climate Outlooks and Advisories

The atmospheric and oceanographic components that form the underlying basis of the *Green Dashboard* (in particular the Home and El Niño/La Niña Pattern pages) are rainfall, winds, storms, sea levels, tides, storm surges, and trains of large wind waves. These components are significant in defining productivity of agroforests and weigh greatly in coastal vegetation and stability. Underlying data are summarized with authority and precision by the *Blue Dashboard* (Potemra & Marra (2016); this project (*Green Dashboard*) interpreted them for the agroforestry management community. These components were selected for dashboard gauge of Below, Normal, and Above conditions of rainfall, wind speed, and sea level of the *Blue Dashboard*, then copied onto the Home page of the *Green Dashboard* (to be described in detail below). Table 1 presents the actual figures and data sources which were presented as color gradients in the calendars for "El Niño" and other years. These variables are discussed below.

Rainfall. As part of a related project, Sutton et al. (2015) developed a rainfall atlas for the Marshall Islands, based on 30 years of satellite data (Luchetti et al., 2016). Unlike the traditionally defined seasons of *Añōneañ* and *Rak,* Sutton's data describes annual wet and dry seasons based on rainfall alone, for an *average* year, a *neutral* year, and for strong and weak El Niño and La Niña phases for Kwajelein and Majuro as shown in Table 1. Figures 2 and 3 show these wet and dry seasons in absolute terms for Kwajalein and Majuro, respectively, so that the ENSO effects can be easily compared with seasonal variation in rainfall. Referring to these figures, the most notable effect of the ENSO cycle is the extreme drought at the beginning of Year 1[5] of a strong El Niño cycle, which fortunately, can be predicted several months ahead of time, typically in April-July of Year 0 (National Oceanic and Atmospheric Administration [NOAA], 2016b). There is also a strong drought at the beginning of Year 0 of a strong La Niña year, but this is recognized in hindsight rather than predicted, and may largely be due

[5] Note that the scientific literature includes multiple systems of nomenclature for the phases of each ENSO cycle. The website adapted and displays a commonly used graphic showing the effects of the "onset," "peak" and "after-effects" phases (Lander, 2016), correlating them to the "Year 0" and "Year 1" nomenclature used by Sutton et al. (2015).

to the cyclical tendency for a La Niña year to follow an El Niño year. Thus, Year 0 of a La Niña is often Year 1 of an El Niño year.[6] The means of the Majuro and Kwajelein data for the 30-year average and for moderate-to-strong El Niño phases, respectively, were averaged in order to provide simple indexes of "average" and "El Niño" rainfall for the Marshall Islands and the agricultural calendars of the *Green Dashboard*.

Winds. In an ENSO-neutral year, the Marshall Islands experience normal easterly winds. During a La Niña year, the easterlies tend to be stronger. In an El Niño year, the easterlies are weaker and there may be westerly winds (Fletcher & Sussman, 2014). Potemra (personal communication, 2017) provided average monthly data from 2008-2015 (Table 1) for an "average" year as well as for a strong El Niño year (2015-16) that formed the basis for wind colorations and/or shadings of the website calendars. During 2015, average wind speeds were lower during the March to August period, but the year as a whole was variable because of storms.

Storms. Tropical cyclones form within the Marshall Islands almost exclusively during El Niño cycles, with a risk of storms in March-June of Year 0, a peak in July of Year 0, continuing through January of Year 1 (NOAA, 2016c). The risk may be higher for a short period around March of Year 0 and during the following November-January period (Lander, 1994). Storms affect agroforests directly, through wind damage, salt spray, and heavy rain; as well as wave action and inundation that may wash out plantings and deposit salty water on inland soils. Based on their analysis of 139 years of records Spennemann and Marschner (1994) found that typhoons were 2.69 times more likely in El Niño years than in non-El Niño years.

Sea Level. The success of coastal stabilization and maintenance of coastal forests (mangroves and strand forest) depends greatly on the interactions of sea level heights with storm surges, tides, and ENSO variation. Sea level is of great interest to forestry practitioners because out-plantings of strand forest or mangrove forest must be positioned and timed to maximize seedling survival. Depending on the species, seedlings should be planted at the appropriate position above or below the high tide mark so that they will become firmly rooted before they are washed away by unusually high-water levels. Sea levels in the Marshall Islands can be about twelve inches above neutral during La Niña events and five inches below neutral during El Niño events (NOAA, 2016a; 2016b). Mangrove species generally grow between mid-tide and high tide mark. If mangroves are planted at mid-tide mark during an El Niño year, they may be planted too deep to receive sufficient oxygen during a following La Niña. Planting of strand species during the lowered sea levels of an El Niño must take into consideration that seedlings must be planted high enough on the beach berm in order to survive the El Niño-associated storms and the stresses of high tides in a later, La Niña year. These sea level impacts are described in the El Niño calendar (Figure 5) using data from NOAA (2015a; 2015b; 2016b).

[6] Readers of the atlas should note that rainfall averages are presented as total rainfall during a three-month period (for example, May-June-July or MJJ) averaged with the same three-month period in different years; these periods overlap, because a similar average is also presented for June-July-August or JJA. For purposes of brevity, this paper may refer to "June" meaning the time period centered on June (MJJ).

Tides. "King tide" known in the Marshall Islands as *ialap lep ko* refers to an especially high tide which occurs quarterly. Tide charts are published by NOAA (2016a) each October for the following year for the Marshalls. As the dates of king tides vary and are more clearly presented in tidal charts, they are not presented in Table 1 nor any of our figures. The tidal charts may show windows of opportunity to plant coastal seedlings a week after a king tide has passed, in order to maximize root development while high tides are a few inches lower for several weeks before the next king tide. In the press and popular usage, "king tide" is also imprecisely used to refer to larger inundation events from storms or unusually large wave trains resulting from distant northern storms.

Storm Surge. Storms and the surges and swells that accompany them persist through more than one tidal cycle and are superimposed on the high tides within that cycle. As a rule of thumb, thirteen-foot (approximately 4 m) surf leads to inundation on atolls (i.e., overtops the beach berm) and is predicted in the short term on "hazardous surf advisories" (Lander, personal communications, 2014-2015). As discussed above, tropical storms are associated with El Niño in the Marshalls, and may either include direct hits on an atoll or swells from nearby storms.

Wave Trains. The Marshall Islands also experience inundation events from trains of large wind waves generated by storms that are too distant for their winds to affect the islands directly. While waves from small sources dissipate as they spread, waves traveling in straight parallel lines from large storms lose little energy as they travel long distances. As with storm surges, these events last through more than one tidal cycle and are superimposed on the high tides within the cycle. Wave trains from storms in the northeast-to-northwest are often severe and are not seasonally predictable. Wave trains from southern storms typically occur in June or the rest of the summer. They are moderate, infrequent events (Lander, personal communications, 2014-2015). The increased possibility of large wave train events in summer is included in the calendars. Inundations in the Marshalls may be predicted up to several days in advance (travel time for the waves) and the effects of predicted inundations superimposed on daily tides are forecasted and posted by Guiles et al. (2016). These forecasts are experimental and do not include the effects of tsunamis or local tropical storms.

Large-scale Ocean Circulation Patterns. These differences between one part of the year to another (ranging 5 cm above and below the mean) are small and are not considered to have much impact on coastal and agroforestry systems. Discussion of these patterns is shown in the *Marshall Islands Climate Outlook* webpage (Potemra & Marra, 2016).

Temperature. As the annual temperature ranges for Majuro and Kwajelein are small, ranging between 28° C in September-October and 27.5° C in February-March, temperature was not selected as a variable for inclusion in the seasonal calendars.

Agricultural Calendars for Normal and El Niño Years - Seasonal Calendars Relating ENSO Predictions to Agroforestry

Traditional Agricultural Calendar. As a unifying concept for agroforestry and in response to requests from stakeholders for a calendar or "planting almanac" in the Marshalls, we developed a traditional agricultural calendar (Table 2) based on a review of the literature and our survey results. The calendar provides partial confirmation of the weather and climate data in Table 1. The information in Table 2 is based on the availability of food crops for the Marshall Islands reported by Spennemann (1992) and for Majuro by Aikne and Kusto (2016). This in turn was used as the basis for Figure 4a and 4b, which is a graphic representation of the availability of food crops and its relationship to the seasonal distribution of rainfall and other climate variables during *Añōneañ* and *Rak* for the Marshall Islands. We generated a single normal calendar for the whole of the Marshall Islands because precipitation and agricultural data (i.e., crop availability) were not available for all parts of the Marshall Islands. The rainfall data used in Figures 4a and 4b is an average of the 30-year mean rainfall for Kwajalein and Majuro, as shown in Table 1. Analysis of the rainfall data with the Marshallese wet and dry seasons shows that *Añōneañ* and *Rak* do not translate simply as "dry" and "wet" seasons. Even given differences between locations and sources, the beginning of *Añōneañ* - September and October according to Merlin et al. (1994), and November according to Williamson and Stone (2001), includes some of the wettest months for both Majuro and Kwajalein, and also according to the data of Sutton et al. (2015). The onset of *Añōneañ* may be defined by the onset of the northeastern trade winds (Abo et al., 1976; Knight, 1982), which clearly takes place in November according to wind data compiled by Potemra (personal communication, 2017). *Rak* begins sometime during the April-July period when rainfall is gradually increasing, and winds are gradually decreasing the representation of the harvest or availability times of various crops in the calendar is a weighted average of the source information in Table 1. A fuller discussion of the traditional agricultural knowledge and calendar of the Marshall Islands will be published in another paper.

Table 1. Climate source information for calendars

Rainfall (mm/3 months centered on:)		*Jan*	*Feb*	*March*	*April*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Kwajalein (30 Year average)		326	271	312	395	451	507	541	594	630	656	606	471
Kwajalein, Moderate-Strong La Niña:	Year 0	287	154	172	225	307	426	498	564	605	636	558	410
	Year +1	316	285	253	324	388	492	509	564	630	656	618	466
Kwajalein, Moderate-Strong El Niño:	Year 0	385	341	437	514	519	558	660	778	781	735	636	518
	Year +1	329	173	175	249	347	471	503	546	592	636	581	428
Majuro (30 Year average)		537	482	530	609	682	701	719	721	725	764	750	672
Majuro, Moderate-Strong La Niña:	Year 0				390	505	673	769	800	790	833	705	591
	Year +1	494	492	466	505	566	680	712	735	740	787	795	753
Majuro, Moderate-Strong El Niño:	Year 0	558	501	599	737	771	764	769	800	783	772	720	685
	Year +1	505	362	313	414	566	757	820	793	747	795	750	618
Average of Kwajelein & Majuro 30-year average (to provide a simple index of annual rainfall for the Marshall Islands)		432	377	421	502	567	604	630	658	678	710	678	572
Average of Kwajelein & Majuro Moderate-strong El Nino: (to provide a simple index of El Nino affected rainfall)	Year 0	472	421	518	626	645	661	715	789	782	754	678	602
	Year 1	417	268	244	332	457	614	661	670	669	715	666	523
Other data-based information:													
Strong El Nino sea levels relative to mean: (inches)	Year 0	0*	0*	0*	0*	0*	0*	-3	-3	-4	-4	-5	-5
	Year 1	-4	-4	-3	-1	-1	0	0*	0*	0*	0*	0*	0*
Average wind speed and direction (knots)		15.7 NE	15.3 NE	14.8 NE	14.2 NE	13.7 NE	12.1 NE	9.5 NE	5.5 E	6.3 E	6.5 E	10.9 NE	13.2 NE
Average wind speed – strong El Nino (knots)	Year 0 (2015)	*15.7*	*15.3*	13.7	11.5E	11.9	12	5	5.2	8.8	5.5	10.5	14.2
	Year 1 (2016)	15	15	*14.8*	*14.2*	*13.7*	*12.1*	*9.5*	*5.5*	*6.3*	*6.5*	*10.9*	*13.2*
El Nino - Tropical storm probability.	Year 0	Virtually no risk	Virtually no risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Higher Risk	Higher Risk
	Year 1	Higher Risk	Little risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk
Neutral/La Nina – Tropical storm probability		Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	Virtually no risk	No risk
Wave train probability (any phase)		Possible	Possible	Possible	Possible	Possible	More likely	More likely	More likely	Possible	Possible	Possible	Possible

* For these months at the beginning and end of a two-year "strong El Nino", the cycle would be transitioning from and into another cycle. Therefore, the "average" value of 0 is shown in these cells and used for purposes of illustration in Figure 5.

Italicized values. For these months at the beginning and end of the "strong El Nino" cycle in 2015-2016, the cycle was transitioning from and into another cycle. Therefore, values from the corresponding "average" month (prior table row) are shown in these cells and used for purposes of illustration in Figure 5.

Information sources: Rainfall data from Sutton et al. (2015); El Nino sea levels from NOAA (2016b); Average wind speed and direction, and average wind speed and direction-strong El Nino from J. T. Potemra (personal communication, 2017); Tropical storm probability from NOAA (2016b; Wave train probability from M.A. Lander (personal communication, 2016).

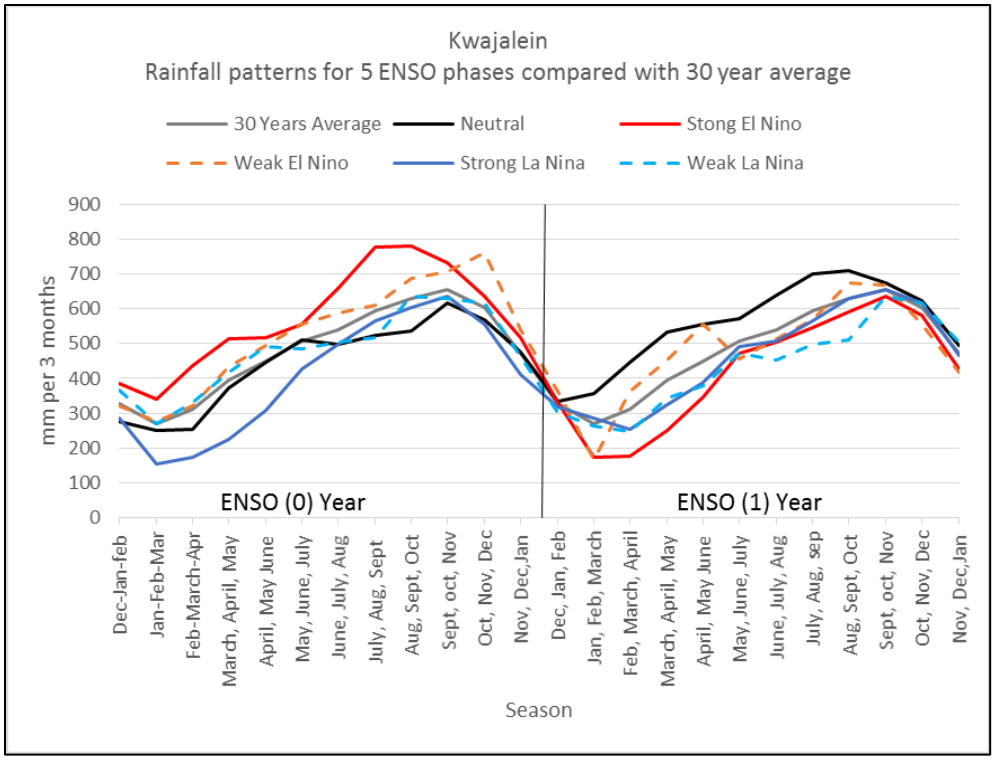


Figure 2. Comparison of rainfall patterns of Kwajalein Atoll for the 5 ENSO phases. Graph by Rufus, L. based on data from Sutton et al. (2015)

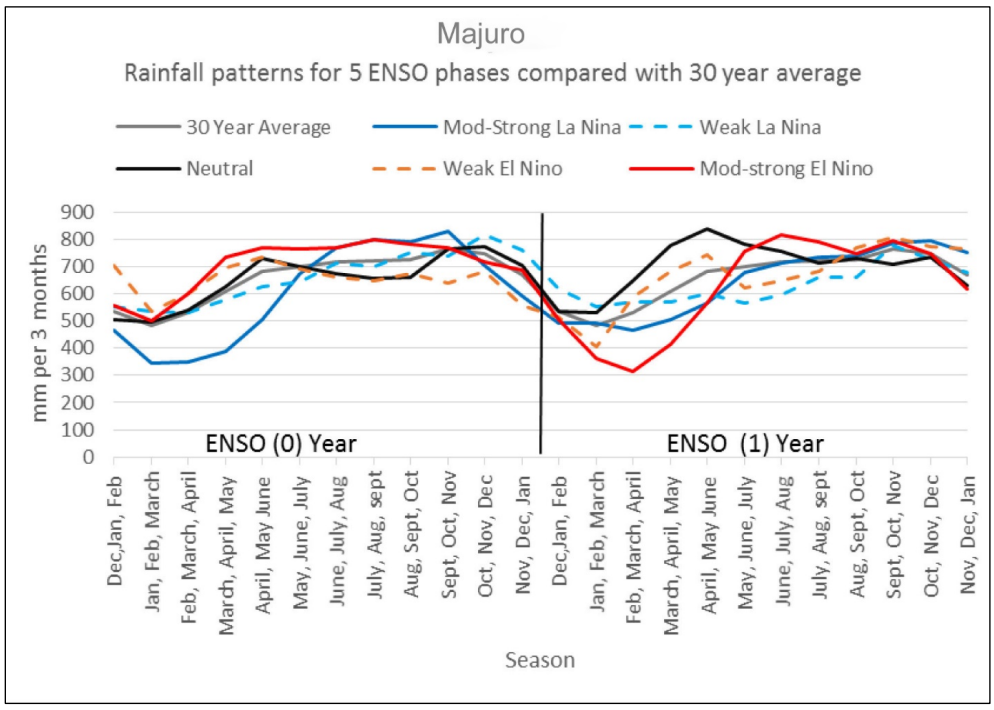


Figure 3. Comparison of rainfall patterns of Majuro Atoll for the 5 ENSO phases. Graph by Rufus, L. based on data from Sutton et al. (2015).

This single generalized agroforestry calendar (Figures 4a and 4b) may be used to represent overall average conditions or ENSO neutral and even La Niña phases. The rationale for this statement is that while the neutral and La Niña phases certainly differ from the average, as shown in the rainfall graphs (Figures 2 and 3) and the rainfall data in Table 1 (Sutton et al., 2015), the differences between these phases are not as striking as those for the medium-strong El Niño phase. Therefore, separate calendars or recommendations for "Neutral" versus "La Niña" conditions are not warranted at this time. For June of Year 0 through May of Year 1 of a neutral or La Niña phase, rainfall does stay within -16% to 26% of the 30-year average for each three-month period, with a few exceptions. The greatest deviation occurs where March-May of Year 1 of the neutral phase generally has 22-28% (Majuro) or 32-43% (Kwajalein) more rain than the 30-year average. Additional rain does not pose as much of a problem as insufficient rain in well-drained atoll soils. The greatest negative deviation (-17-21%) occurs around March-April of year 1 of a La Niña cycle. Until and unless there is more certainty and predictability in the differences between these phases, agroforestry recommendations and practices for average, neutral and La Niña conditions should continue to focus on diversification, resiliency, and "no-regrets" practices for sustainability and risk avoidance. This is considered a fundamental general strategy of diversified traditional agroforestry systems worldwide (Malézieux et al., 2009).

By contrast, a medium-strong El Niño event has a distinct and predictable drought, as well as an increased probability of storms. These conditions make a separate agroforestry calendar and recommendations (Figures 5a and 5b) valuable for El Niño. This calendar runs for about two years and encompasses all 18 months when the storm and rainfall patterns are characteristic of El Niño (i.e., onset, peak, and post-peak after-effects); plus, additional months during which crops mature to harvest following the El Niño drought. These two calendars (Figures 4a, 4b and 5a, 5b) do not attempt to provide quantitative harvest information or timing specific to a given atoll; instead, they illustrate the difference between the El Niño pattern and the agricultural norm. The representation of diminished harvests is based on actual conditions; e.g., in April 2016, the U.S. provided 4-7 months of food aid to moderately to severely affected Marshallese atolls where breadfruit, coconut, and other trees were no longer producing crops (Heine, 2016; United States Embassy Marshall Islands, 2016). This calendar (Figure 5a) is shown with a gap that prevents it from circling on itself, since after 24 months it does not usually return to another El Niño cycle, but typically transitions to the generalized conditions (average, neutral, or La Niña) represented by Figures 4a and 4b.

The *Green Dashboard*

The *Agroforestry in the Climate of the Marshall Islands* website (i.e., the *Green Dashboard* by Friday et al., 2017) was developed in order to provide agroforestry and related practitioners in the Marshall Islands with information on suitable plant species to mitigate the effects of ENSO induced drought, seasonal outlooks about sea level in relation to tides, storms and other disturbances, and information on appropriate plant

species for the protection or restoration of coastal vegetation. The *Green Dashboard* achieves the following (Haws, 2018):

1. It draws directly from online, constantly updated, spatially referenced information about environmental variables provided by NOAA's National Climatic Data Center in the *Blue Dashboard* (Potemra & Marra, 2016).

Table 2. Marshallese Agricultural Calendar

		Eprōḷ	Māe	Juun	Juḷae	Oḳwōj	Jeptōmḃa	Oktoba	Nobōmḃa	Tijōmḃa	Jānwōde	Pāpwōde	Mạaj
Traditional Marshallese Seasons General (Marshalls-wide) Source: Merlin et al (1994); Abo et al (1976)		Rak (Summer, Wet)					Anonean (Winter, Dry)						
		Wōtōn Ma (Breadfruit Season)					Pal (Ḿakṃōk Season)						
							Wōtōn Bob (Pandanus Season) (Also called Wōtōn Iertob)						
Traditional Marshallese Seasons Namu Atoll (between Kwajelein and Majuro) Source: Williamson and Stone (2001)		Anonean (Winter, Dry)			Rak (Summer, Wet)				Anonean (Winter, Dry)				
		Pal (Ḿakṃōk Season)							Pal (Ḿakṃōk Season)				
		Wōtōn Bob (Pandanus Season) (Also called Wōtōn Iertob)			Wōtōn Ma (Breadfruit Season)				Wōtōn Bob (Pandanus Season) (Also called Wōtōn Iertob)				
Seasonality of Marshallese Food Plants After Spennemann, (1992) • = In full production + = Harvestable Availability of Majuro and Arno Plant Foods After Aikne & Kusto (2016) = In full production = Harvestable	Artocarpus altilis		+	•	•	•	+					•	•
	A. mariannensis		+	•	•	+							
	Pandanus tectorius							+	•	•	•	+	
	Tacca leontopetaloides						+	•	•	•	•	•	+
	Alocasia maccrorhiza	•					•	•	•	•	•	•	•
	Colocasia esculenta	+	•	•	•	•	+						
	Cyrtosperma merkusii	•	+			+	•	•	•	•	•	•	•
	Cocos nucifera	•	•	•	•	•	•	•	•	•	•	•	•
	Musa spp.	•	•	•	•	•	•	•	•	•	•	•	•
	Crinum bakeri	•	•	•	•	•	•	•	•	•	•	•	•
	Ixora casei	•	•	•	•	•	•	•	•	•	•	•	•
	Ipomoea batatas												
	Citrus sp.												
Rainfall (mm)	Kwajalein (30 Year)	395	451	507	541	594	630	656	606	471	326	271	312
Rainfall (mm)	Majuro (30 Year)	609	682	701	719	721	725	764	750	672	537	482	530

Rainfall data from Sutton et al., (2015).

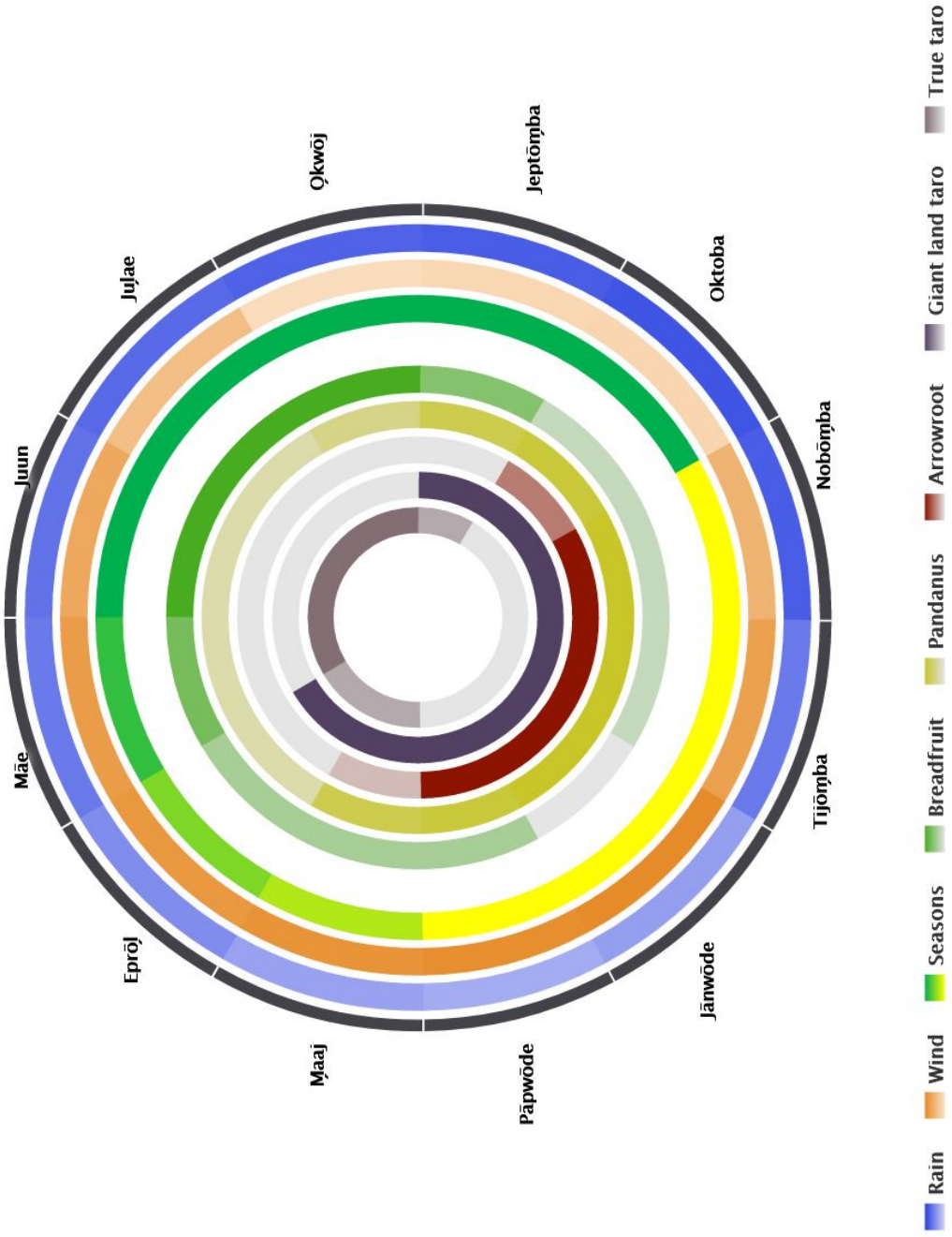


Figure 4a. The traditional Marshallese agricultural calendar.
Computer graphics by Michael Best as conceptualized by Kathleen Friday.

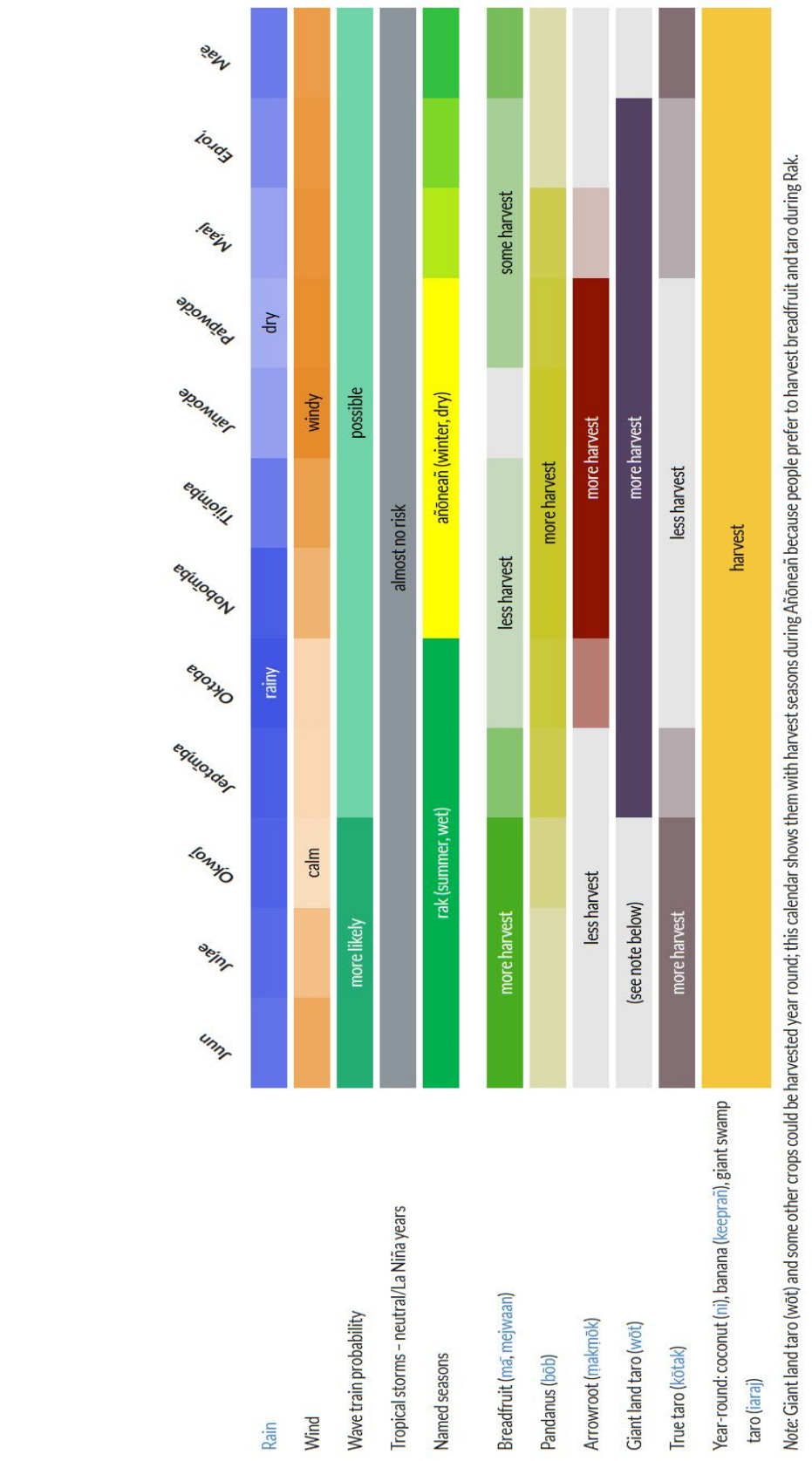


Figure 4b. The traditional Marshallese agricultural calendar
Computer graphics by Michael Best as conceptualized by Kathleen Friday.

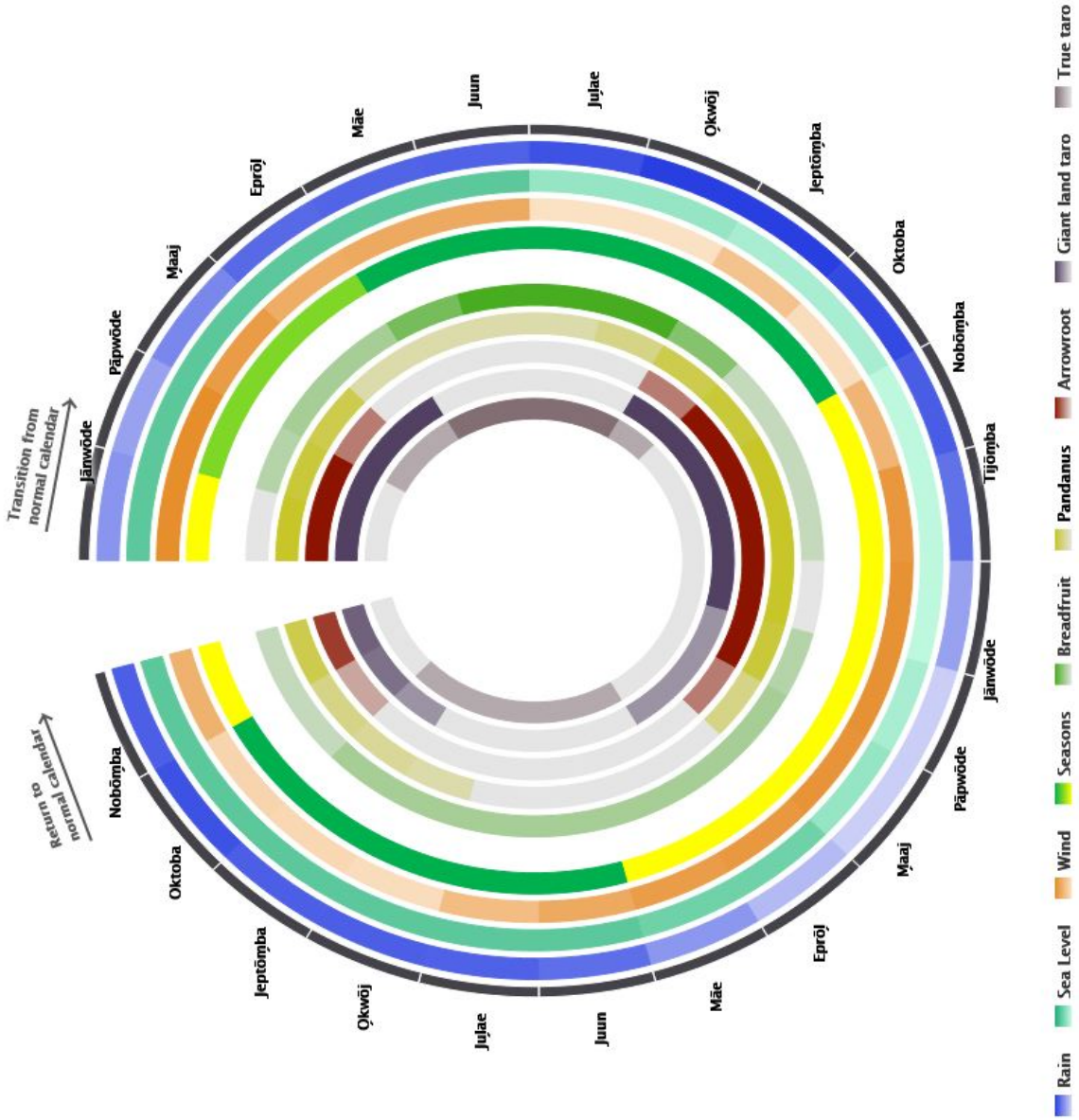
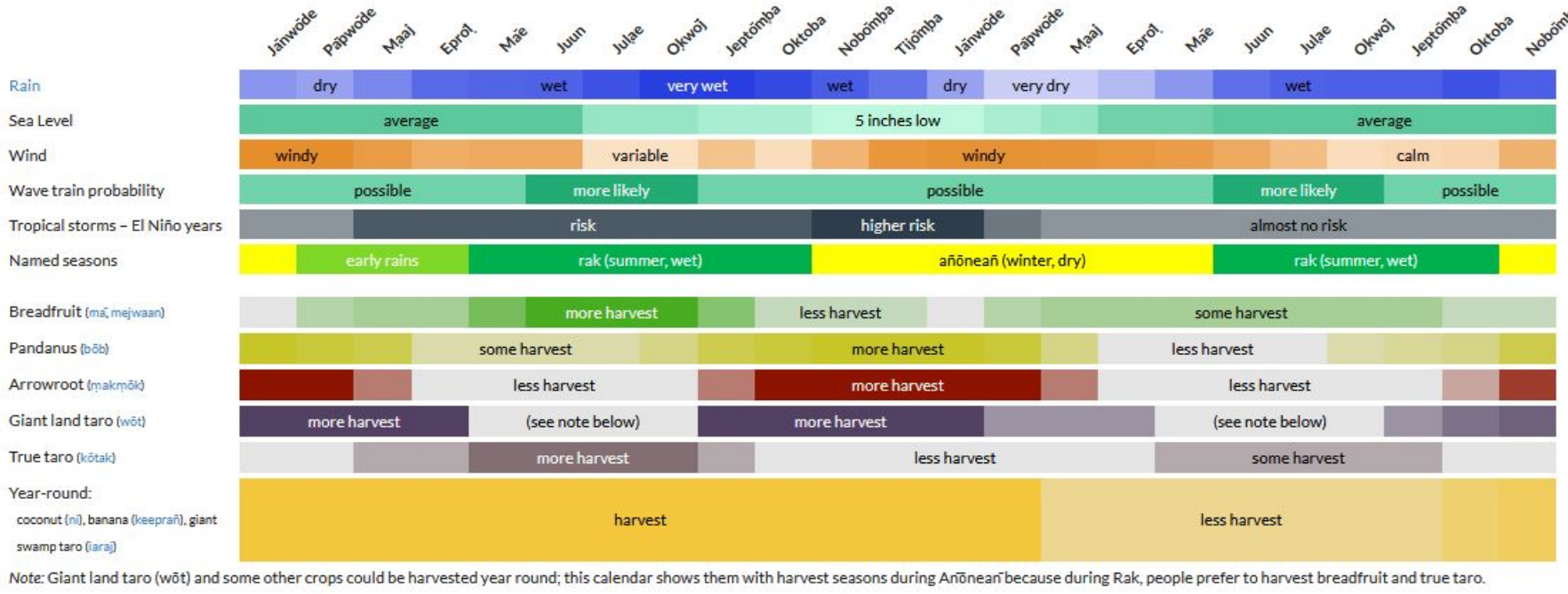


Figure 5a. The Marshallese agricultural calendar for the El Niño cycle. Computer graphics by Michael Best as conceptualized by Kathleen Friday.



Note: Giant land taro (wōt) and some other crops could be harvested year round; this calendar shows them with harvest seasons during Añōneañ because during Rak, people prefer to harvest breadfruit and true taro.

Figure 5b. The Marshallese agricultural calendar for the El Niño cycle.
Computer graphics by Michael Best as conceptualized by Kathleen Friday.

2. It provides information for a given location and timeframe, concerning recommended agroforestry species, cultivars, and management practices.
3. It provides information for shoreline protection efforts.
4. It supplies a framework for referring users to additional relevant information concerning nutrition and culture.
5. It has a user interface and secondary products suited to Marshallese users.

Table 3 summarizes the structure and organization of the *Green Dashboard*, along with its components and links to other websites and related information. The website consists of six interlinked website pages (Home, El Niño/La Niña Pattern, Calendars, Recommendations, Coastal Forest, and Salt and Drought Tolerant Species). Most of the information is presented in both English and Marshallese. Readers may want to access the *Green Dashboard* while reading the ensuing discussion: http://oos.soest.hawaii.edu/pacific-rcc/Marshalls%20Agroforestry/site/

The Home Page

The Home page of the Green website consists of dashboard styled dial gauges that indicate the atmospheric and oceanographic conditions of the Marshall Islands, namely current quarterly rainfall, wind speed and sea levels presented earlier in Table 1, and the current advisory and outlook for an El Niño, Normal, or La Niña year. These variables are indicated on the gauges as Below, Normal, and Above as defined earlier in Table 1 by Sutton et al. (2015). The indicator levels are updated monthly through a direct link with the Marshall Islands Climate Outlook website.

The El Niño/La Niña Pattern Page

Using the trade winds as its basis, this page defines and graphically illustrates the two-year cycle of the El Niño Southern Oscillation. The 24-month graph (Figure 6) depicts the onset, peak and after- effects of the cycle; it illustrates the distribution of tropical cyclones, rainfall, sea level, drought, and harvests with symbols. The page also presents information of the El Nino alert system and its stages, the La Nina pattern, the ENSO rainfall pattern for Kwajalein and Majuro and (Figures 2 and 3), and links to the distribution of rainfall and drought in the Marshall Islands during the major phases of the El Niño Southern Oscillation and other relevant information.

The Calendars Page

This page presents the two agroforestry calendars described previously; the traditional, normal, generalized calendar (Figure 4) and the El Niño agroforestry calendar (Figure 5) by drop-down links. As the climatic rationale for the two calendars has been discussed previously, the discussion here serves to point out that the horizontal bar graph includes two additional descriptions, probability of large wind wave train events and tropical storm occurrences. Additionally, the horizontal graphs include a brief easily readable textual description of each listed climate or food plant

item. Links to the Marshallese traditional food plants, the food availability lists by Spennemann (1992) and Aikne and Kusto (2016), and other relevant topics are presented.

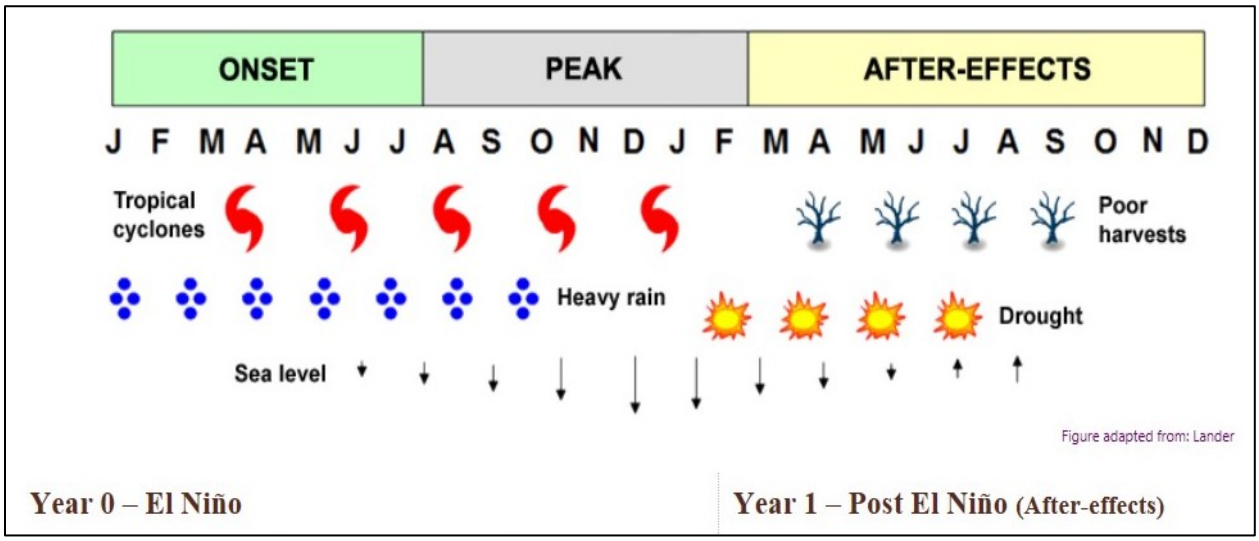


Figure 6. The 24-month graph of the ENSO cycle for the Marshall Islands showing symbolically the distribution pattern of tropical cyclones, rainfall, sea level, drought, and harvests. This graph by Lander (2016) is found on the El Niño/La Niña pattern page of the *Green Dashboard*.

The Recommendations Page

It is evident that sea level rise and El Niño induced droughts have and will continue to have serious negative impacts on the physical and human environments of the Marshall Islands. The observations and respondents' answers regarding Marshallese traditional knowledge, and their perceptions of the drought and salt tolerant cultivars suggest a range of recommendations. These are aimed at promoting and therefore strengthening the knowledge and practice of traditional agroforestry. Also needed are simple, common sense, hard and soft recommendations and relatively inexpensive approaches and efforts to mitigate the erosive effects of storm surges and higher tides which will become more severe with global climate change and El Niño. Many of these recommendations are found throughout the *Green Dashboard* and on the Recommendations Page. Examples of other comparable recommendations are presented in Bell and Taylor (2015), Reti (2008), ADB (2011, 2013), and in the publications of PIRCA. A full list of these recommendations that consider the social, economic, and physical environments of the Marshall Islands are presented by Manner et al. (2017). They advocate conservation and maintenance of the coastal forests; development of educational programs that foster the importance of coastal vegetation as a protective, stabilizing component of atoll life; identification of crop species that are less susceptible to drought and salinity; the use of *Alocasia*

macrorrhiza (*wot*) as a food source; and the increased number of water catchment systems, along with increased frequency of catchment repair.

The Coastal Forest Page

For the flora and vegetation of the Marshall Islands, as well as the factors that determine their distribution, documentation has been plentiful (e.g., Fosberg, 1949, 1960; Mueller-Dombois & Fosberg, 1998; Bechte, 1884; Koidzumi, 1915; Devaney, 1987; Taylor, 1950; Wiens, 1962; Vander Velde, 2003; and Thaman, 2008). Fosberg (1949) has ascribed this pattern of atoll vegetation to a gradient of salinity which decreases as one moves from the coastal stand to the more mesic interior atoll forests on large islets. On smaller islets or cays, this zonation is limited to the first two salt-tolerant plant communities. While the mixed broadleaf forest is the most common vegetation in undisturbed places, there are also mono-dominant forest and single species communities.

The Coastal Forest page of the *Green Website* consists of two sections: 1. Strand Vegetation; and 2. Mangroves. Each section is described by means of a colored profile diagram showing the location of representative species (with their Marshallese names) along the shore and shallow waters. The profile diagrams are based on the personal observations and work experience of Sared (2016), who planted mangroves in the atolls of Chuuk, and contain information and directions for protecting, conserving, and rehabilitating mangroves and coastal forests in the face of rising sea levels, storm surges, and king tides. For example, the notation for *(Rhizophora mucronata)* reads:

> *Eoeak* or *Būḷaboḷ (Rhizophora)* is called a *fringe* species because it can grow on the seaward edge of a mangrove forest. Plant large propagules at mean sea level, about halfway between the high tide and low tide points, where it will be inundated by any day's high tide. If it is an El Niño year, the sea levels might be unusually low, so plant them where it is shallow, because when normal weather returns, the water will be deeper.

Similarly, for planting strand species, the recommendation reads:

> Plan ahead. Soon after a king tide is a good time, to allow a few months for seedlings to take root before the next king tide. Check the tide charts.

Salt and Drought Tolerant Species Page

One objective of the *Green Dashboard* project was to revise and update the species information and practice standards for the Marshall Islands in the Pacific Islands Area Vegetative Guide (PIAVG) so that it would better reflect the ecology of these islands. For example, many species that were not native to the Marshall Islands or were better adapted to the environmental conditions of the high Pacific Islands were removed; while many coastal strand and mangrove species that were missing from the database (e.g., *Pemphis acidula, Hibiscus tiliaceus, Bruguiera gymnorrhiza, Rhizophora*

mucronata, Lumnitzera littorea and Sonneratia alba) were added. The species identified for listing in the PIAVG database were mainly based on field observations (of species distribution), the experiences and opinions of Marshallese experts and lay people, and the literature.

This web page presents a list of 47 salt-tolerant species and a list of 70 drought-tolerant species. Each species is listed by its common names (English and Marshallese) and scientific names. Wind tolerance and plant type are listed for the salt-tolerant species. For drought-tolerant species, the maximum and minimum rainfall limits, drought-tolerance, and plant type are indicated.

Table 3. Simplified Structure and Contents of the Agroforestry in the Climate of the Marshall Islands (Green) Website.
http://oos.soest.hawaii.edu/pacific-rcc/Marshalls%20Agroforestry/site/

Home	El Nino/La Nina Pattern	Calendars	Recommendations	Coastal Forest	Salt and Drought Tolerant Species
Dashboard-Gauges of current conditions of rainfall, wind speed and sea level for the beginning and ending of the quarter, updated monthly	The El Nino Southern Oscillation (ENSO) Diagram showing the onset, peak, and after-effects of tropical cyclones, rainfall, drought, poor harvests, and sea level	Marshallese traditional Agroforestry calendar-normal years (12 months)	El Nino Recommendations for Agroforestry: 1. Protection of coastal vegetation 2. Preparation for storms. 3. Caring of crops during wet weather during El Nino. 4. Planning ahead for drought during La NIna.	Care for Coastal Forests 1. Work with people 2. Work with nature 3. Strand vegetation Species & zones When to plant Protection Case studies 4. Mangroves Definition Whether to plant Species & zones When to plant Technical advice Case studies	Tables of Salt-tolerant and Drought-tolerant Species. 1. Salt-tolerant species table (Lists 5 mangrove, 11 strand and 31 other species) 2.Drought-tolerant species table (Lists 70 tree, shrub, herbs, and vines)
El Nino/La Nina Watch-Gauges of the current advisory and outlook, updated monthly	Year 0 – El Nino and Year 1- Post El Nino (after-effects)	Marshallese agroforestry calendar for El Nino years (23 months)			
Traditional Agroforestry Calendar	La Nina (Note)		Long-term: The lifetime of a tree or Person (See listing of recommendations presented on the Home Page).		
Recommendations, Long term: The lifetime of a tree or person Plant resilient trees and crops that can tolerate drought and salty conditions. Enjoy traditional foods that keep you healthy with vitamins and fiber. Care for coastal forest that holds the shoreline and protects crops from salt spray. Learn about the effects of climate change in the Marshalls.	Rainfall pattern for 5 ENSO phases compared with 30-year averages for: Majuro and Kwajalein				
	Two panel maps of rainfall and drought across the Marshall Islands for the 5 ENSO phases: Moderate – Strong El Niño Weak El Niño Neutral Weak La Niña Moderate – Strong La Niña				
Links to related materials and websites					
Marshall Islands Climate Outlook Pacific ENSO Applications Center (PEAC) bulletin Inundation information for Majuro and Kwajelein What is the El Niño/La Niña pattern? Learn about the Marshallese traditional agroforestry calendar.	ENSO alert system El Niño recommendations for agroforestry in the Marshalls More about El Niño and its impacts in the Marshalls Information about ENSO and why the climate in the Pacific is different from year to year.	Seasonality of Marshallese Food Plants Availability of Fruits and Vegetables in Majuro Pandanus (bōb) The northern atolls have a strong dry season and are more affected by the El Niño drought.	Advice on rainfall predictions Additional relevant readings: Climate Change in the Marshall Islands and Climate Variability, Extremes and Change in the Western Tropical Pacific. Information on Edible hibiscus Readiness for El Nino Project	Strand vegetation Mangroves Coastal Change in the Pacific Islands (8MB). 2015 Out planting on Woja Causeway, Ailinglaplap Atoll "Coastal Change Toolkit"	Coral Atoll Agroforestry Plant Screener in the USDA NRCS website

There is also a direct link to the USDA Natural Resources Conservation Service (NRCS) Coral Atoll Agroforestry Plant Screener (NRCS, 2017). The screener is a simple plant sorting tool designed to select non-invasive plant species that are best adapted to the ecosystems of the islands. It should be noted that the information of the salt and/or drought tolerances of these species are rarely definitive as experimental data on the tolerances of these species to salt or drought is generally unavailable.

Organization and Maintenance of the *Green Dashboard* Website

The *Green Dashboard* is hosted by the Asia-Pacific Data Research Center at the University of Hawai'i in Manoa (UH). It has been duplicated on the College of the Marshall Islands (CMI) website where its ongoing corrections and maintenance are funded through a grant from the USDA Forest Service. It is envisioned that the website will be hosted solely by the CMI in the near future as more Marshall Islanders gain the skills required to maintain and update the site, whereas the UH *Green Dashboard* will not be further edited. It is also noteworthy that the *Green Dashboard* is one of the few management and planning tools to have been translated into Marshallese at this point in time. Meetings are intended to be regularly held to evaluate and update the content, inform Marshall Islanders of the website and how to use it, address problems and issues of content and availability, and sound out Marshall Islanders and others of future directions and needs to be addressed. For example, at the April 13, 2019 meeting on the *Green Dashboard*, it was recommended that recent findings by Reidmiller et al. (2018) be incorporated. These are based on the Fourth National Climate Assessment of relevance to the Marshall Islands. Also to be considered is the addition of information on La Niña and Normal events to the Recommendations tab, repair of broken links, addition of new links and recommendations, a smartphone application, and publicity through social media.

Concluding Remarks

The *Agroforestry in the Climate of the Marshall Islands*, or *Green Dashboard* was developed to meet the requests from agricultural stakeholders and other relevant agencies in the Marshall Islands for information about suitable food species to plant after a drought and the effects of long-term global climate change and sea level rise. It is linked directly to the *Climate Dashboard* (or *Blue Dashboard)* developed by Potemra and Marra (2016), which provides current information on the Marshall Islands climate.

The *Green Dashboard* is presented in 6 pages with drop-down menus and links to other information and websites. The information for this project was based on a literature search, observations in the field, and interviews with 39 Marshall Islanders regarding their traditional ecological knowledge. For the interviews a series of questionnaires were developed, with the questions translated into Marshallese and administered by Marshallese speakers. The *Green Dashboard* provides Marshall Islanders with up-to-date ocean, climate, and agro-ecological information that they can use to mitigate the impacts of sea level rise and droughts associated with ENSO in their

native language. As such, it could serve as a model for the development of similar dashboards for the other Pacific Islands which also have to deal with the threat and impacts of global climate change and sea level rise.

It should be noted that the recognition of ENSO patterns and the associated ability to predict stormy seasons and drought is relatively new to western science. As our data collection was limited to a short field research time frame and interviews on Majuro and Arno, we were not able to determine if this information ever existed in Marshallese traditional knowledge. If so, explanation of this pattern and its applicability to atoll agroforestry is new, valuable, and practical information for the Marshall Islands.

The intended audience for the *Green Dashboard* is agroforestry extension agents and community leaders, who we believe would be able to understand the information and convey recommendations to agroforestry practitioners. The content of the website includes indigenous knowledge of older generations, data from Western science, and practical experience of managers from outside the Marshalls. In practice it appears that those perusing the website in depth have included education programs in the Marshalls working with the younger generation, and non-Marshallese professionals seeking an overview before beginning in-depth work in the Marshalls.

Finally, as many Marshallese have little desire to migrate in response to the negative impacts of climate change on their islands (Rudiak-Gould, 2013), we feel that the *Green Dashboard* is a very timely and appropriate agroforestry tool for the Marshall Islands. It offers much needed information, strategies and adaptations to community leaders and the citizenry in an innovative way that we believe will promote the availability of the atoll's resources to support human life, hopefully at least for the next 40 years.

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Inter-Species Compact is the Origin of Our Environmental Wisdom

Sutej Hugu
Indigenous Community Conserved Areas Consortium

What does Pacific Island/Oceanic wisdom mean to you?

Pongso no Tao (Orchid Island, Taiwan), one of the so-called Pacific small islands that are rooted in the ocean, surrounded by coral reefs, passed by ocean currents, visited seasonally by migratory birds and migratory fishes, encountering tropical cyclones and Monsoon annually, and connected by Austronesian Indigenous seafaring. We've experienced climate change in extreme weather, global warming, and species migration. there inherited the inter-species compact between the noble black-winged flying fish and Tao ancestor, evolved an eco-calendar calibrated by the biological clock in the ecosystem cycle and having two types of indigenous fisheries of coral reef fishing and migratory fishing.

How/why do you bring island wisdom into your scholarship?

The eco-calendar is the simple but subtle indigenous holistic knowledge in its real play. While Inter-species compact becomes the foundation of their customary marine governance institution and the implementation of rights of nature. That's also an alternative multidimensional zoning system for the conservation of natural resources and environment as the basis of

community sustainability, and creating the food diversity and sovereignty for the resilience of *Tao* people. It's a wonderful model of Indigenous sovereignty and customary governance based on tribal community connected to and embedded in their inter-species habitats for the trinity of language, cultural and biological diversity.

Recollections of *Fadang* and *Fanihi*: The Taste and Smell of CHamoru Bygone Foods and the Challenge of Endangered Island Species

Else Demeulenaere
University of Guam

Donald H Rubinstein
University of Guam

Sveta Yamin-Pasternak
University of Alaska Fairbanks

Amy Lauren Lovecraft
University of Alaska Fairbanks

Stefanie M. Ickert-Bond
University of Alaska Fairbanks

Abstract

Pacific Islands have a high degree of biocultural diversity. On Guåhan (Guam), the CHamoru people's traditional knowledge, practices, and language developed in tandem with the island's biological diversity for over 3,500 years. Global processes such as colonization, globalization, and modernization put the island's biocultural diversity at risk. Two endemic species, the *fadang* and the *fanihi*, a cycad and a fruit bat, are threatened with extinction. Both *fadang* and *fanihi* are traditionally eaten as food. Open-ended interviews allowed participants to tell their stories of taste and smell, and their recollections preparing and sharing endemic dishes like the *titiyas fadang* and *kådu fanihi* with their elders. Endangered species conservation can play a role in preserving these practices alongside their emphasis on biodiversity protection. Recovery plans, inclusive of traditional practices, can protect this biocultural diversity. A council of traditional and scientific knowledge holders, grounded in the CHamoru value system, can guide its implementation.

A Story of Taste, Smell, and Sharing

For people growing up on a small Pacific island, the proximity of the ocean and the flora and fauna surrounding people's homes foster a connection to the land and sea. Stories of elders interweave a child's experiences with words of wisdom and knowledge, shaping a physical and spiritual relationship with the natural environment, honoring a holistic Indigenous worldview. One way of sharing this unique island culture is through the preparation and sharing of food. Children learn to husk coconuts and to fish at a young age. Communities share these foods of the land and the sea with their families, neighbors and at celebrations with the entire community.

Such is the experience of the CHamoru people of Guåhan (Guam), the most southern island of the Mariana Islands in the northwestern Pacific Ocean. One of the *manåmko'* (elders) in our neighborhood, Rosalind Pilar Paulino Dydasco, taught my children and I (Else Demeulenaere), how to grow and prepare certain traditional foods. CHamoru values surrounding food such as the practice of *chenchule'* (reciprocity) are paramount, and especially valued is *ka'lo yan fattoigue*', bringing prepared food to

someone's house and staying over for a conversation (Aguon, 2020). During walks in the garden and along the limestone forest, my family learned about Indigenous plants and animals. We listened to stories about Rosalind's childhood and how her family used these plants and animals. Rosalind's story about the traditional preparation of *titiyas fadang,* tortillas made of the flour of the *fadang* seed (*Cycas micronesica*)*,* stood out to me. Her family used the flour made from *fadang* to make CHamoru tortillas. The word "*titiyas*" (pronounced tee-TEE-juhs) was adapted from the way the CHamoru people pronounced "tortillas" introduced from Mexico during the missionary period in the 17th century (personal communication, J. Flores, October 27, 2020). These stories provide local context to global processes such as colonization, globalization, and modernization, which introduced new foods and increased the dependence on imported food, disrupting traditional food systems (Parrotta & Trosper, 2012). The introduction of starches such as corn during the Spanish colonial era reduced the use of traditional starches (Tolentino, 2018). Rosalind's recollection of the atmosphere during the preparation of *titiyas fadang* painted a powerful story connecting endemic foods with traditional preparation methods. Her stories detailed the abundance of cycads in the forest nearby, the social interactions she had with family members during processing and preparation of the *titiyas fadang*, and the exquisite taste and divine smell of the *titiyas fadang*. Besides the *fadang*, the abundance of birds, fruit bats, and other native plants diminished in her lifetime.

After my children began attending school, I (Else Demeulenaere) started working as a biologist at the University of Guam. As an endangered species specialist, I worked with endangered plant and animal species in Micronesia for seven years. In 2011, Marler & Lawrence reported a high cycad mortality rate after the introduction of a scale insect pest in 2003. The cycad became threatened with extinction and was listed as threatened in 2015 under the Endangered Species Act (ESA) (U.S. Fish and Wildlife Service, 2015). I recalled my neighbor's story of the *titiyas fadang*. The once abundant population of *fadang* in the forest surrounding Rosalind's house plummeted alongside other cycad populations on the island and could not be harvested anymore. I realized that incorporating the restoration of traditional food and other cultural practices is a crucial part of endangered species conservation.

Other similar cultural food stories followed, such as the Mariana fruit bat or *fanihi* (*Pteropus mariannus*), which used to be prepared as a prized dish for the *fi'esta* (celebration of a patron saint of a parish) and *gupot* (celebration) table (Guampedia 2020). The preparing and sharing of food at a *fi'esta* or *gupot* occur in the spirit of *inafa'maolek*, which means "restoring harmony or order, cooperation, and interdependence" (Mendiola, 2020; Perez-Yyechad, 2020). *Fanihi* populations declined and became threatened with extinction in the 1980s. Mostly elders, but also 40-50 year old people recollect the acquired taste of *fanihi* and the value and pride of sharing *fanihi* dishes at the *fi'esta* or *gupot* table. The *fadang* and *fanihi* and their use by the CHamoru people are examples of a rich biocultural diversity that was once present on the island of Guåhan.

Maffi (2005, p 602) defines biocultural diversity as "diversity of life in all its manifestations – biological, cultural, and linguistic – which are interrelated within a

complex social-ecological system". Many scholars have examined the link between high levels of biodiversity and Indigenous people (Loh & Harmon, 2005; Toledo, 2013; Parrotta et al., 2016). Biocultural diversity is especially high on islands because of their geographic isolation and the way Indigenous knowledge and culture practices are tied to their unique biodiversity, while adapting to changes in their environments (Loh & Harmon 2005; Tershy et al., 2015). The Mariana Islands are part of the Micronesia-Polynesia biodiversity hotspot. The region has high species endemism rates and biocultural diversity (Myers et al., 2000; Loh & Harmon, 2005). The Mariana Islands, Palau, and Yap are closer to the Indo-Pacific center of biodiversity around Indonesia and Eastern Asia (Mueller-Dombois & Fosberg, 1992) and consequently have a greater biodiversity than found on islands farther east from the Indo-Pacific center.

National endangered species conservation policies such as the Endangered Species Act focus on preserving the world's rapidly declining biodiversity, which threatens to bring devastating consequences to the earth's ecosystem functionality and stability (Isbell, 2010). The islands' biocultural diversity loss deserves more attention and protection in this conservation story, as it will benefit the islands' biodiversity and its people to prevent converging extinction crises between culture, language, and biodiversity (Maffi, 2005; Loh & Harmon, 2014), aspects of life that are very important to CHamoru people.

This study aims to emphasize the important and unique connections the CHamoru people have with plants and animals and how global processes can cause parallel extinctions of plants, animals, and cultural practices. We pursued an interdisciplinary research approach to ensure Indigenous perspectives and traditions are part of the conservation discussion. A CHamoru epistemology forms the basis of this research. This ethnographic study used a qualitative mixed method approach, comprising participant observation and storytelling, open-ended interviews, and bibliographic research to answer three key questions: (a) are the traditional food practices and the stories of taste and smell tied to endangered species at risk of being lost?, (b) how is the CHamoru worldview and CHamoru value system tied to the way of knowing these endemic species?, and (c) can Traditional Ecological Knowledge (TEK) and Scientific Ecological Knowledge (SEK) unite in a co-production of knowledge to guide conservation efforts such as outlined in local and national endangered species regulations?

We can summarize the results as: (a) endangered species and their traditional use as food are at risk of being lost alongside the people's memories of taste, smell, sharing customs, storytelling, and transgenerational knowledge transmission, (b) the CHamoru worldview and value system is connected to the biodiversity of the Mariana Islands and (c) community, inclusive of activism-oriented groups, TEK holder' and scientists' involvement are necessary to protect endangered species, the CHamoru people's cultural food practices. A co-production of knowledge (TEK and SEK) can protect and conserve the *fadang* by outlining sustainable harvest practices in endangered species regulations. This study is part of a larger interdisciplinary case study on the protection of TEK of endemic and native plants using a mixed-method approach to identify governance structures and levels that can allow for the protection

and management of sacred places to the Indigenous people and for the continued perpetuation of TEK practices.

A Community Integrated Mixed-Method Ethnographic Approach

We employed a qualitative mixed-method approach to gather ethnographic data and perceptions about the CHamoru values and practices surrounding food and how they relate to plants, more specifically endangered endemic species, using the *fadang* and *fanihi* as an example (Creswell & Clark, 2011).

During sixteen in-person, open-ended interviews, the interviewer, Else Demeulenaere, asked about the use and preparation of *fadang*. The interviews were recorded and transcribed verbatim (Martin, 2004). After the initial in-person interviews, the interviewer asked the interviewees follow-up questions over the phone. The participants were able to edit the quotes (sent by email) cited in this manuscript. Participant observation (by Else Demeulenaere) was not intended to happen intentionally for this research but allowed me to listen to stories or have conversations with *manåmko'* and TEK holders as a member of the community and as a biologist (Creswell & Clark, 2011). These stories were not recorded nor transcribed but provided the researcher a more holistic view on CHamoru values and cultural aspects surrounding food. Lastly, we gathered biological, ethnobotanical, archeological, and ethnographical information from historical documents and studies by ethnobotanists/biologists and archaeologists. This triangulation of methods increased the validity of the data (Østreng, 2010; Creswell & Clark, 2011; Jernigan, 2012). An age-cohort analysis of interviewees aided in the ethnohistorical reconstruction of social change and identified the effects of global processes on traditional endemic food practices (Yamin-Pasternak et al., 2014). Knowledge retention per age group was tabulated along with the reasons why certain knowledge concerning *fadang* and *fanihi* was retained or why it was lost.

We would like to elaborate on the use of storytelling as a valid method in qualitative research. Storytelling helps to understand the importance of different aspects of society because stories transmit lived experiences of values, culture, place, environment, and language (Turner and Turner, 2008; Bird et al., 2009; Kuhnlein et al., 2009; Smith, 2012). This research method focuses on a people- and place-specific context, emerging from an Indigenous epistemology grounded in its community (Smith, 2012; Tuck & McKenzie, 2015). Storytelling brings forward the different dimensions of an eating occasion centered around food. When the interviewer listened to participants, the stories addressed different settings, such as collecting plants in the jungle, preparing plant dishes in the kitchen, decorating the table during a *fi'esta* or a *gupot*, as well as who joined the quest for food, how the making of food was celebrated, shared, and valued. Similarly, cookbooks can track social and ideological change over time, and illustrate different settings (Gold, 2007), but storytelling will add that extra dimension of social interactions (for instance sharing and cultural teaching), to the table. Although taste and smell are sensory experiences in the moment, people have the ability to bring these memories back through storytelling. When participants

talked about food, the thought of these endemic foods made their mouths water; they sniffed the air which led them to the warm memories of preparing these foods with their elders.

The CHamoru Worldview, Core Values Surrounding Food, and Diet Changes

CHamoru epistemology forms the basis of this research. Ancient CHamoru people viewed humans and nature as interdependent, recognizing that all of nature has an essence or spirit (Phillips, 2019). Today the CHamoru people, the *taotao tano'* (or people of the land), still exhibit strong connections to the land and uphold this worldview. CHamoru values relating to food have unique names and are expressed in a specific way. *Inafa'maolek* is one concept that supports the idea that land and its produce belong to everyone (Cunningham, 1992). CHamoru people still practice the *inafa'maolek* spirit and they value *chenchule'* by the sharing of foods, visualizing, and providing a taste of the culture. Today's CHamoru society continues to share these values of generosity (*geftao*) and hospitality (*yo'ase'*). The CHamoru people are very generous and always invite people to attend a *gupot*, offering food and drinks. When people leave the party, the hosts offer *balutan* (bundle of packaged food) as CHamoru people prepare enough food for their guests so they can also take some food home with them.

When the first ancestors of the CHamoru people migrated to Guåhan 3,500 years ago, they brought food plants such as *lemai* (breadfruit or *Artocarpus atilis*), *gaddo'* (yam or *Dioscorea esculenta*), *suni* (taro or *Colocasia esculenta*), *atmagosu* or bittermelon (*Momordica charantia*), *loofah* or *patola* (*Luffa acutangula*) and *fa'i* (rice or *Oryza sativa*) (Pollock, 1983; Cunningham, 1992; Dixon et al., 2012). The CHamoru people used native and endemic food plants present on the island such as *niyok* (*Cocos nucifera*), *dokduk* (*Artocarpus mariannensis*), *kafu* (*Pandanus tectorius*), and *pahong* (*Pandanus dubius*). The *Makana*, CHamoru healers, prepared herbal teas for healing and as a vitamin-rich supplement to their heavy starch-fish dominated diet (McMakin, 1978).

When the Spanish colonized Guåhan, the CHamoru diet changed. After the Spaniards burned the CHamoru people's *proas* (large ocean-going sailing canoes) (Amesbury et al. 2008), a 20-year long war ensued between the CHamoru and Spanish from 1671 to 1691. The Spanish colonizers instituted a policy of *reducción* to diminish resistance amongst the CHamoru people, by forcibly resettling the people into new villages around the Catholic Church (Rogers, 1995; Kuper, 2014). After the destruction of the *proas*, traditional pelagic fishing practices and food trade among the islands almost ended. The Spanish also brought domesticated farm animals such as pigs in the 1600s, which increased the CHamoru consumption of meat (Wiles et al., 1996). Colonization by the Spanish brought other foods to the Mariana Islands as well, such as *papaya* (*Carica papaya*), *kamuti* (*Ipomea batatas*), *alageta* (*Persea americana*), and *laguana* (*Annona muricata*). The CHamoru people incorporated these plants into their diets.

The most influential food relating to the *fadang* story is the introduction of corn or *mai'es* (*Zea mays*). This starch is also used to prepare *titiyas* and does not require pre-processing, such as is the case for *fadang*. Although the CHamoru people used *mai'es* for *titiyas,* they kept making *titiyas fadang*. The *låncho* or ranch system was created by CHamoru people after the *reducción*. This practice involved part-time residence away from the village centers and close to the jungle where CHamoru people could still maintain their farms, growing food crops, raising farm animals, and practicing their rituals while being protected by the view of the *hålomtåno'* or jungle, away from the Spanish priests and soldiers (Bevacqua, 2019). Although the Spaniards prohibited the traditional healers *makåna* and *kakåhna* from practicing, the traditional healing culture and use of herbs for overall health was sustained by *suruhånas* and *suruhånus*, a new name given by the Spanish (Lizama, 2014; Salas, 2018). In the 1770s, the Spanish introduced more meat into the CHamoru diet by bringing deer to Guåhan (Safford, 1905). Deer together with the introduced pigs had devastating effects on Guåhan's native and endemic flora (Morton & Perry 1999). Ungulates (hoofed animals such as deer and pig) had never been present on Guåhan (Wiles et al., 1996).

While the Spanish introduced meat, new starches, and tropical fruits, the CHamoru diet changed more drastically after WWII. Processed mass-manufactured industrialized foods with high concentrations of refined hyperprocessed carbohydrate and fat such as Spam®, corned beef, sausages, as well as sugar-loaded drinks became popular (Leon Guerrero et al., 2008). Traditional knowledge holders said the use of *fadang* for *titiyas* lessened substantially after the war. When housing and infrastructure development increased on the island towards the end of the twentieth century, the ungulate pressure on the vegetation increased. Because the pigs could not find sufficient food in the jungle, they started destroying local crops in people's yards, further harming native and endemic plants and foods. A good example to illustrate the effect of ungulate damage is the preparing of a traditional dish called *gollai hågun suni,* which is a dish made of the leaves of *suni* (taro) cooked in coconut milk. People used to grow suni, turmeric, lime, hot peppers, and coconut in their backyard to prepare *gollai hågun suni*. Nowadays people mostly replace the *suni* with imported frozen spinach and canned coconut milk because it is easier to use, but also because pigs dig up the roots of the *suni*. Despite these cultural changes, people still use locally sourced lime, turmeric, and hot peppers in this dish. The dish is still found at every *fi'esta* or *gupot*. Yam used to be very popular to make *boñelos dagu* (donuts) but yam is another crop favored by the wild pigs. When I, (Else Demeulenaere) the interviewer and neighbor of Roselind, started a garden in southern Guåhan 15 years ago the vines of the yam Rosalind gave me covered my kids' bamboo teepee. Several housing developments sprang up in the neighborhood in anticipation of the military build-up and have substantially increased the pressure from the pigs. Among the breadfruit trees available on the island, the endemic *dokduk* is not used as much compared to the introduced *lemai*.

Niyok is still used in many traditional dishes, but the accidental introduction of the rhinoceros beetle (*Oryctes rhinoceros*) damaged or killed many coconut trees (Moore et al., 2015). The *yo'åmte* (term used for today's traditional healers) still

preserve the dualistic function of preparing medicine and making *åmot tininu*, a wellness tea used for body cleansing and to improve overall health (personal communication, *yo'åmte* Mama Chai and S. Aguon, 2019). Lizama (2014) notes that people in Guåhan still value Indigenous healing, which is inclusive of the dualistic function of herbs to sustain an overall healthy lifestyle and provide nutrition. As many CHamoru people have pride in consuming traditional cultural foods with locally sourced ingredients, it is important to find ways to protect these plants.

Threatened with Extinction: The Practices and Stories of Taste and Smell

Pacific Island communities pass traditional knowledge on from generation to generation, embedded in the language, as the CHamoru language is spoken during food acquisition, preparation, and during eating occasions (Forsyth, 2012; Lee, 2014; Lizama, 2014). Island cultures modified traditional practices over time, which today may differ among island cultures, communities, and even families. Traditional relationships between generations are important in passing on this knowledge. Tangible and intangible aspects of traditional knowledge and value systems make these traditional relationships very strong and special (Lee, 2014). A shift from subsistence living to a cash-based economy disrupted many of these traditional ways. The Federated States of Micronesia for instance is experiencing a loss of knowledge retention (Lee et al., 2001). The current study about *fadang* and *fanihi* aims to illustrate the importance of traditional knowledge and value systems and how they can link to plant conservation. Participants shared the importance of passing on the knowledge of harvesting and cycad processing practices, and the ways CHamoru people share this food and use it as medicine.

Ethnobotany and history books about the Mariana Islands list the use of *fadang* for food (McMakin, 1978; Safford, 1905; Pobutsky et al., 1991; Cunningham, 1992) and medicine. A topical medicine is made from the *fadang* to treat skin fungus and ringworms (Pobutsky et al., 1991; Borenstein et al., 2007). "The *fadang* used to be very common. Viewing the limestone forest from the ocean along northwest Guåhan, one out of every four trees was *fadang*" (L. Cunningham, October 29, 2020: personal communication with F. Cruz). "The CHamoru people used the *fadang* pre-contact time" (personal communication, M. Ramirez, March 15, 2019) (McMakin, 1978; Pollock, 1986; Safford, 1905; Dixon et al., 2010; Bayman et al. 2012). Archaeologists found pollen of *fadang* in earthen ovens (Horrocks, 2016). "The cycad microfossil remains were from earth ovens. Pollen rather than phytoliths was found, so not necessarily food remains but ambient windblown particles" (personal communication, B. Dixon, 2020). "Along with breadfruit, taro, and yam, *fadang* was a common staple likely before the introduction of corn" (personal communication, J. Tuquero, January 23, 2019; October 29, 2020).

Gathering and Processing the Fadang Seeds

CHamoru people gathered the *fadang* seeds in the forest. In CHamoru culture, family members collected and processed food together. The men would typically collect the *fadang* seeds and split them, while women processed them. The CHamoru people knew the *fadang* seeds contained toxins (cyanide). Different ways of leaching the seeds are documented to ensure the toxins were washed out and the seeds were safe to use by the CHamoru people. The first leaching technique occurred in the rivers and might be the oldest technique. Figure 1 accompanies the first story told by Hope Cristobal.

> There are a lot of cycads at Mount Alutom, at Famha' and Manenggon. After gathering mature seeds, our elders used the embedded basalt boulders at riverbanks to prepare the seeds by pounding them with a *manu* or hard grinding stone on a *lusong* (mortar) to crack them open. The cracked seeds are gathered and placed in a gunny sack secured to a tree root or rock and left in the rushing river to wash for a few weeks--until my aunts determine there are no more toxins in them. The leached cracked seeds were then spread out and dried a bit on a mat and placed in the sun. The dried seeds are then ground up usually in a manual cast-iron grinder (*molino*) that is attached to a solid table. The product is a fine starchy flour that is stored in an airtight container and placed in the icebox. (personal communication, H. Cristobal, October 27, 2020).

Figure 1: The lusong (mortar) imprints are still visible in the basalt boulders at the riverbanks of Mount Alutom (photos provided by Maria Cristobal).

> The Mayor of Agat told me that he collected *fadang* 'nuts' in the Fena area when he was a boy. He transported the *fadang* nuts in gunny sacks loaded on a carabao. He sold the *fadang* nuts to people in Sumay. Sumay was the second largest village in Guam before WWII. His customers processed the *fadang* nuts into flour to make *titiyas*. A man from Piti reported that he chopped up *fadang* nuts and then put them in a gunny sack. Next, he tied the gunny sack into a freshwater stream for two weeks. This leached the poison out of the *fadang* nuts.

> Then the nuts could be processed into flour (personal communication, L. Cunningham, January 16, 2020; October 29, 2020).

A second leaching technique, called "the soaking and rinsing technique" is practiced at home. People who still make the flour today mostly use this technique. "The women soak the seeds, process, and cook them. Because it was a lot of work, extended family members all worked together" (personal communication, R. Dydasco, December 1, 2018; October 26, 2020). The different stories below contain different nuances and recollections of this leaching technique.

Artist Judy Flores describes the process and depicts the preparation of the *titiyas fadang* in Figure 2. The *fadang flour* was mixed with water or coconut milk to make *titiyas*. Typically, people cooked the *titiyas* on a heated *kommat* (cast-iron pan) over an open fire (Flores, 2020).

> The *fadang* trees were very abundant. Only adults would harvest the seeds because we tried to avoid children being exposed to the toxin in the seed and to the pollen of the male cones. We husked the seeds in the jungle. Then we cut them up in chips and soaked them. The water was changed every day for two to three weeks. We sun-dried them and put them in containers. We stored the seeds in these containers until we were planning to prepare the *titiyas*. Mostly they were stored and only used when a storm passed by and food was scarcer (personal communication, J. Quinata, August 16, 2020; October 26, 2020).

> When the seeds were ripe, we harvested a big tub full of them. Processing cycad seeds is time consuming. The brown seeds have a hard shell [seed coat] and are very difficult to open. We cut the seeds in half and take the soft part [the starchy cotyledons] out. Then, we soaked the seeds in water and put them outside under the porch. My mother changed the water in the morning and in the evening for a few weeks. The water needed to be changed until the water was clear. This process helped to get rid of the poison in the seeds. Then we dried the seeds. My aunts would come and help to grind the seeds. We use a handheld grinder fixed on the table to manually grind the seeds into flour. Then we put the flour in containers for later use to make *titiyas* (personal communication, R. Dydasco, December 1, 2018; October 26, 2020).

> As a young teenager I helped collect the seeds from the wild. Four to six people go into the bush and collect, and might represent three or four different families, usually the siblings. Everybody is related. We collect them a few times a year. I do not know what the trigger is when the elders say, 'Let's go'. We brought the seeds home. I helped, cleaning the seed, splitting the kernels, changing the water. We cleansed the water every day for at least a week, probably more than that. I do not remember rushing it. They most likely soaked them longer, as long as you change the water all the time. They do not shorten the process. Some of it is stored as split kernels, some of it is ground up and stored temporarily that

way. Usually that is used for *titiyas*. People usually do not let the grounded material sit around long (personal communication, F. Cruz, February 8, 2019; October 27, 2020).

Figure 2: The woman is demonstrating the making of *titiyas*. When corn was scarce, they processed the cycad, called *fadang*. In the foreground (left-right) is the ripe seed which grows in clusters at the base of the fronds of the female cycad tree. Next is the round, flat meat (the starchy cotyledons, or embryonic leaves) released from its hard case. These are cut in half to form half-circles, or crescents. These are soaked in barrels or pots of water which are changed daily for two weeks. The discarded water emits a strong, sour smell. After two weeks the toxin is gone, and they dry the crescents in the sun until bone dry for storage. The plate in the middle has the dried crescent ready to grind on the *metate* (ground stone). She mixes the ground *fadang* flour with water, kneads it into a ball, then presses it flat onto a waxy banana leaf. From there it is baked on the flat, cast iron pan (called *kommat*) over an open fire. This drawing from the 1970s is part of a series depicting traditional practices demonstrated at Lanchon Antigo, a cultural village prior to GefPa'go (Drawing and description provided by Judy Flores, 2020).

The Cooking, Sharing, Flavor and Smell of Titiyas Fadang

What struck me, (Else Demeulenaere), the most as the neighbor of Roselind and when interacting with traditional knowledge holders, are the stories about the *titiyas fadang* and the description of the taste and smell. CHamoru people prepare *titiyas harina* (made of flour and additionally sweetened), *titiyas mai'es* (made of corn), *titiyas lemmai* (made of breadfruit), and *titiyas fadang* (Flores, 2020). Nowadays *titiyas månha* are very popular and are made from young coconut. These types of *titiyas* are shared at a *fi'esta* or a *gupot*. People described the texture, flavor, and smell of *titiyas fadang*. Some people really loved the taste of *titiyas fadang*, describing them as the best *titiyas*, while others did not like them, but would still eat them out of respect, and then eventually acquire a taste for them. Larry Cunningham (personal communication, January 16, 2020; October 29, 2020) told me that the father of one of his friends liked the *titiyas* if they prepared the flour when it was still brown (not processed as long) because he thought it was more flavorful. CHamoru families oftentimes prepare food together and share meals. The Chamoru people also share food through the act of giving. *Chenchule'* (reciprocity), is the core of a support and exchange system that traditionally exists between families, but also extends to neighbors and friends. *Ka'lo yan fattoigue'* is referred to the making a lot of food and wanting to share it (Aguon, 2020). When you share food, a great opportunity arises to stay over for a conversation. *Titiyas fadang* would typically not be shared at the *fi'esta* or *gupot* table because it was time consuming to make them and rather rare to have them available. Two participants said *titiyas fadang* would be shared in the back kitchen during a *fi'esta or* a *gupot* and offered to the cooks.

> The *titiyas fadang* are so good because they are chewy and not soft. They are not sweet but surely have their own specific taste. When my mom would make *titiyas*, her sisters and sister-in-law would come and help make them. I could smell it in my room when my mother prepared the *titiyas* on the cast-iron skillet. I loved the smell. The smell of *titiyas fadang* is very soothing. We ate them with *fish kelguan* or just by itself. Being together with my family to eat them was a feast. I loved it! (personal communication, R. Dydasco, December 1, 2018; October 26, 2020).

> I grew up with the taste of *titiyas fadang* or flat unleavened bread or tortilla made of *fadang*. We ate the food that was served on the table and were not allowed to refuse "i grasian Yu'os" (God's grace). We understood the hardship and hard work it takes to prepare our foods. The process of collecting and preparing the *titiyas fadang* is time consuming. The *titiyas* and the *pilota* [dumplings] in *kådu* [soup] is a delicacy. The sharing of this food at the family table was considered very special. The *titiyas fadang* had a unique taste and texture. Our family consisted of extended family members who lived together or nearby. We shared food and other necessities. Our elders would make a big pot of *kadu* and

> share it with everybody. We all ate the same foods (personal communication, H. Cristobal, October 27, 2020).
>
> I like the *titiyas fadang*, but the only thing about the *titiyas fadang* it is only good when it is fresh. When you let it go old, by tomorrow, it would be hard, almost like leather, a little bit pliable. At that point, it is recycled and thrown into a soup to soften it up, boil it, usually in the soup. In my family it ended up with coconut milk in the soup, most likely with chicken or fresh beef (personal communication, F. Cruz, February 2, 2019; October 27, 2020).

Participants who were young at the time they ate the *titiyas fadang* remembered the smell of processing the seeds. Some had mixed feelings about the taste of *titiyas fadang* and did not like the taste or smell. "The *titiyas fadang* tasted sour and fermented. I like the corn ones better. When I was growing up, it was a famine food, but people had learned to like it. I remember our neighbors processing *fadang*, how it smelled as they changed the water. When they poured out the water this horrible smell would come out" (personal communication, J. Flores, May 25, 2019; October 27, 2020). Other younger people shared similar sentiments. But the youngest participant who ate *titiyas fadang* thought they were delicious. "*Titiyas fadang* had a very distinct taste. They taste better than the Spanish introduced corn and flour *titiyas*" (personal communication, J. Tuquero, January 23, 2019; October 29, 2020).

The Hunting, Cooking, Sharing, Flavor and Smell of Fanihi

While I was interviewing and during conversations about *fadang* and other plant species, participants would bring up the *fanihi* (fruit bat). Participants mentioned that the *fanihi* eats the seed coat (sarcotesta) of the *fadang* seeds (Figure 3). They would also share similar stories about the use of the *fanihi* as a traditional food and emphasized the taste and smell (Figure 3). Many people said they ate *fanihi* as a child and liked it. "Before the introduction of guns people would catch them with a net while they were sleeping in a tree. At night you would see a blanket of black bats, huge colonies starting to go out for the night" (personal communication, L. Cunningham, January 16, 2020; October 29, 2020). "My recollection is that in general, men would hunt for *fanihi* and the women would prepare it" (personal communication, D. Lujan, January 28, 2020; November 12, 2020). The *fanihi* would be shared at a *fi'esta*. "*Fanihi* was a specialty at *fi'estas*. People always tried to have as much variety as they could on the table. Fruit bat soup was a delicacy. The taste was very distinct. It was really a man's food. It smells like skunk" (personal communication, J. Flores, May 25, 2019; October 27, 2020). After it was becoming endangered in the 1980s people stopped eating *fanihi* in Guåhan and *fanihi* were not seen at the *fi'esta* table anymore.

> We used to have fruit bats in our backyard. They would come to the *dokduk* tree in the season. Fruit bats were part of our diet. It was seasonal, but still regular. During those times of the year there was *dokduk*, my father did not have to go

far to get fruit bat. Just go out of the backdoor and shoot it. Where I grew up there was jungle. There was nobody in the vicinity for a mile (personal communication, F. Cruz, February 8, 2019; October 27, 2020).

Fanihi smells really good, especially when it is cooked in coconut milk. It would be a sweet smell. The taste is ok, but I only like the wing. It is soupy. I would break it up and suck the wing. When I was young there were a lot of *fanihi*, so we could share them at the *fi'esta* table (personal communication, R. Dydasco, December 1, 2018; October 26, 2020).

I like the *fanihi*. It became an acquired taste. As a child we would only eat the wings, because when we saw the bat in the pot it looked like a rat. Later as I got older, I started to appreciate everything, even the fur, intestines, and the head. I enjoyed the taste of it. We cooked it in three different ways. We prepared *fanihi* as a regular stew, with water and onions. *Fanihi* was also cooked with coconut milk, as a soup. Lastly, we ate *fanihi* in coconut milk soup with corn added (personal communication, J. Tuquero, January 23, 2019; October 29, 2020).

When I visit Palau and smell cooked *fanihi*, it brings back memories of the days with my grandpa and grandma. They all passed on. Even when I am in the jungle and the fruit bats show up (I know that sounds weird) my mouth waters. My mouth is watering right now talking about it" (personal communication, D. Lujan, January 28, 2020; November 12, 2020).

I recently had the special opportunity to enjoy the taste of *fanihi* in Palau. It was what I remember it to be. I did not see an abundance of *fanihi* at our dinner table; if we did, it is usually my mom who would enjoy it. We, kids, basically just had a taste or two. It never looked appetizing as the animal was cooked whole and you can imagine the creature's teeth showing in the pot. It is usually cooked in coconut milk and the sauce is quite delicious. Mom would place a small piece of flesh on our plate with our rice and the coconut milk sauce. It tasted like "corned beef" to me. I liked it. My mom usually ate the head part as well as the skin and wings (personal communication, H. Cristobal, October 27, 2020).

Fanihi is delicious, especially with taro. When you smell it while they cook it, it does not matter how it looks, but you cannot help being attracted to it. Everything is eaten, including the fur and wings. There is not much taste on the wings. When you go to a *fi'esta* it is usually gone by the time you get there. When you had fruit bat at a party you were the king (personal communication, L. Cunningham, January 16, 2020; October 29, 2018).

At the old *fi'esta*, you have your normal food, and then you have your special food, that is kind of in the back kitchen. Obviously, it is always *fanihi* or turtle. You have your main plate, main spread up front on the table. But then someone

would say "Hey in the back kitchen we have *fanihi* there". It was highly prized (personal communication, D. Lujan, January 28, 2020; November 12, 2020).

The *fanihi* has flown
My story is known
Catch it!
And you can make yourself
A furry pet or a delicious meal

(poem by L. Cunningham)

Figure 3: The picture on the left shows a *fanihi* eating a *fadang* seed (Merlin Tuttle). The picture on the top right is *kå'du fanihi* with coconut milk. The picture on right below is a *fanihi* dish in Palau (picture provided by Hope Cristobal).

The Mariana Islands' Native Breadfruit Story

We would like to tell one more story of taste. *Dokduk* is an endemic breadfruit and one of the favored foods for the *fanihi* (Wiles, 2005). The tree is currently still abundant, but recruitment has slowed down substantially because wild pigs and deer eat the fruits (Wiles, 2005). Insect pests also plague the trees. People used to eat the fruit and seeds, but the non-native seedless breadfruit *lemai* is preferred nowadays.

Few people still eat the seeds of the *dokduk*, called *hutu*. The collection and preparation of the fruit and seed was also shared with family members. "It would be the same with breadfruit season. My aunts would come and help. They would dry the breadfruit in the outside oven, put them in big cans and make flour with it" (personal communication, R. Dydasco, December 1, 2018; October 26, 2020). The reason we tell this last story is because this endemic species is not threatened with extinction yet. When conservationists, scientists, and traditional knowledge holders work together this species can be saved and thrive in Guåhan's forest and around people's gardens.

> The seeds of the *dokduk* would take long to boil. They taste like chestnuts. We would bake the *dokduk* fruit. That is so good. It is sweeter than the *lemai*. People would mostly use the seeds. The seeds would be more for your own consumption, not to bring to the *fi'esta*. But we often would cook more and then bring it to people (personal communication, R. Dydasco, December 1, 2018; October 26, 2020).

> We use both the *dokduk* fruit and the *hutu* (the seed). We would collect 50 pounds of *hutu*. We usually carried sacks. It is difficult to find ripe intact *dokduk* fruit because they are very delicate. We pick mature fruit. We collect ripe ones, but it is really hard to find ripe ones that are intact. They are very delicate. Where I grew up, there were a lot of trees in our vicinity. There were certain trees my father pointed out. Those were the trees we would collect the fruit from. We do not collect the fruit from just any tree. There are preferred ones. The *hutu*, we just boil. The *dokduk* fruit itself, primarily we boiled it, sometimes we had it with coconut milk. We boil the riper ones. The older ones we would hold until they start to soften. That is when they are really sweet. That one is really sweet. It is sweeter than *lemai*. The fruit is almost liquidy. We would eat the really ripe one fresh. When we get the ripe one, we pick it off the tree and eat the flesh fresh. We shared the *dokduk* and *hutu* on *fi'estas*, but it was seasonal (personal communication, F. Cruz, February 8, 2019; October 27, 2020).

> I eat *hutu* (cooked *dokduk* seeds) occasionally. With or without salt, you boil them for like twenty minutes or roast them for about 20 to 30 minutes. You can find fallen fruits at places where there are no deer or pigs. At those places you can see recruitment of *dokduk*, but where there are high populations of deer and pigs there is little recruitment (personal communication, J. Tuquero, January 23, 2019; October 29, 2020).

A Reflection on the Uncertain Etiology of Lytico-Bodig: How did *Fadang* and *Fanihi* get Involved?

In the 1950s a disease known locally as Lytico-bodig (amyotrophic lateral sclerosis-parkinsonism-dementia or ALS-PDC) was prevalent in Guåhan, especially in the village of Umatac (Steele, 2005; Weiner, 2005; Keck, 2011). Researchers proposed

competing hypotheses in search for the cause of the disease. Several hypotheses were linked to the consumption of *fadang* and *fanihi* (Keck, 2011). As of today, the etiology of Guåhan's ALS-PDC is still uncertain. This study does not aim to analyze this topic, as many have done so (Monson et al., 2003, Keck, 2011). I rely mostly on the work of Verena Keck (2011) who used an anthropological approach to look at the causes of the disease. I used her work as a guide to the literature and to summarize the "search for a cause" as she states in her title. Although I did not gather information from participants in relation to the disease, some people mentioned Lytico-bodig.

The first hypothesis is the "genetic hypothesis", suggesting the disease is heritable. Two other hypotheses suggested neurotoxins found in *fadang* and *fanihi* are causing Guåhan's ALS-PDC. The second hypothesis is the "*fadang* hypothesis", which suggests that the flour produced from the cycads seeds contains the toxic beta-N-methylamino-L-alanine (BMAA), which causes the disease. This hypothesis was first posed by Whiting in the mid-1950s (1963) and later studied by other scientists. The third hypothesis suggests that people ingested BMAA when eating fruit bats who bioaccumulate the toxin in their tissues (Cox & Sacks, 2002). Later, a fourth hypothesis suggested the BMAA comes from cyanobacteria living in the roots of the cycad trees (Cox et al., 2003). Lastly, the "aluminum toxicity hypothesis" suggests that low calcium and magnesium concentration in the soil and water lead to a higher accumulation of aluminum in the brain (Yanagihara et al., 1984).

The CHamoru people have passed on the processing techniques of the cycad through generations, with the primary focus of removing the toxins through leaching. TEK holders who processed the fruits and ate the *titiyas fadang* emphasized the need to follow the protocols strictly to wash out the toxins. Most participants did not worry about the disease. TEK holders said it was one of their main staples and that they knew how to process the seeds. These few statements align with the sentiment Keck (2011) gathered from the CHamoru people. The significance of traditional food and traditional ways of knowing how to leach the toxins conflicted with the *fadang* and *fanihi* hypotheses. Both TEK and SEK offered explanations and ways of relieving patients. In her concluding chapter Keck calls for a new agenda of Indigenous research, grounded in decolonization methodologies (Smith 2012), where Indigenous people themselves initiate the need for research and Indigenous participation. Although Lytico-Bodig is disappearing, new cases of parkinsonism, dementia and ALS arise and are clinically different from Lytico-Bodig. CHamoru people continue to be asked to partake in ALS research.

Weaving Together Different Ways of Knowing and Protecting: Science, Traditional Food Knowledge, and Activism

The search for synergy between traditional and scientific ecological knowledge to advise natural resources practices, planning, education, and protection has found a legitimate place among academic Indigenous and non-Indigenous scholars (Kimmerer, 2015; Hoagland, 2017). To develop local sustainable conservation and policy strategies, TEK needs to be preserved in the island's culture and Indigenous

language (Maffi, 2005; Pretty et al. 2008, Hong et al., 2013). Activists also have an important voice in preserving ecosystems, species, and traditional knowledge, especially in the context of Guåhan. We first provide a short description of how SEK contributes to the recovery of *fadang* and *fanihi*. Secondly, we illustrate how activism is an important force for preserving a species. Lastly, we look how these ways of knowing and protecting can be woven together to advance biocultural heritage.

Cycas micronesica is endemic to Micronesia (Figure 4). Cycads are the only native naked seed plant (gymnosperm) in Guåhan. Gymnosperms dominate temperate and boreal biomes in the form of conifers. Cycads are part of a group of plants that were once abundant during the times dinosaurs lived on the Earth. They are now much restricted in numbers, found solely in tropical and subtropical regions, and many cycads face extinction in the wild. Resembling palms in overall appearance because of their large, divided leaves and stout trunks, cycads are an attractive horticulture plant. Many also are of cultural and religious significance, all contributing to their threatened status. The *fadang* used to be one of the most dominant tree species in Guåhan's limestone forest (Donnegan et al., 2004). Over the past seven years the health of the cycad populations plummeted because of an invasive scale insect. Infestations with the scale *Aulacaspis yasumatsui* have caused a lot of damage to adult trees (Moore et al., 2006; Marler & Lawrence, 2012). Similarly, the scale affects seedling recruitment, contributing to the further decline of *fadang*. The U.S. Fish and Wildlife Service listed the *fadang* as threatened under the ESA in 2015 (Department of Interior, 2015). *Cycas micronesica* occurs on the Micronesian islands of Guåhan, Luta (Rota), Yap, and Palau in limestone forests, beach habitats, and riparian areas. The scale is only found on the islands of Guåhan and Luta. Researchers at the University of Guam follow population trends, developed conservation horticultural practices, and study pollination biology of the cycads. This scientific knowledge is important to battle insect pests and increase seed propagation success.

Figure 4: *Cycas micronesia* or *fadang* (male cone on the left, female cone on the top right, ripe seeds on the bottom right).

Pteropus mariannus or Mariana fruit bat is endemic to the Mariana Islands. The *fanihi*'s diet comprises many native fruits and the sacrotesta (seed coat) of the *fadang* seeds (Wiles, 1987). The *fanihi* is also threatened with extinction and has been listed since 1984 as endangered in Guåhan (U.S. Fish and Wildlife Service, 1984), and as threatened in 2005 throughout its range in the Mariana Islands (U.S. Fish and Wildlife Service, 2005). The *fanihi* has been included in the Convention on International Trade in Endangered Species (CITES) list since 1990 as "threatened with extinction". Researchers are monitoring the fruit bat populations in Guåhan and Luta and studying their behavior.

In 2016, a social movement led by Prutehi Litekyan re-connected the CHamoru youth with the *fanihi*, as the construction of a firing range to accommodate the translocation of Marines from Okinawa to Guåhan is threatening the habitat of the *fanihi* at Litekyan and Tailålo, sacred places to the CHamoru people. During protests artists depicted the *fanihi*, illustrating the deep connection the *fanihi* has with its environment and its people (Figure 5). Memes on social media called for action to protect the *fanihi* (Figure 5). The strict regulations put forward by the ESA relating to Indigenous food stand in a sad contrast to the destruction of *fanihi* and *fadang* habitats,

which has long-lasting effects for the island's ecosystem and the cultural practices tied to these species.

The *fanihi* in the Mariana Islands are known to display inter-island migration which may be highly influenced by typhoons, illegal hunting, and wildlife fires. As biologists continue to monitor the Mariana Islands' population, we should all do our part and plant native trees, spay and neuter our pets, discourage invasive species, and refrain from illegal burning (personal communication, J. Quitugua, May 21, 2018; November 18, 2020).

The military will uproot thousands of cycads to construct the firing range. While the ESA is the mechanism in place to protect biological diversity, it fails to prevent this large habitat destruction. The ESA regulations also miss the chance to connect natural and cultural heritage, while incorporating sustainable biocultural protection.

These stories are a call for action to incorporate these different ways of knowing (science, traditional food knowledge, activism) in endangered species regulations such as the ESA. Mildenstein (2016), a fruit bat biologist, recommends research on the impacts of hunting in Oceania because fruit bats are a culturally important food. To avoid unregulated hunting, recovery plans under the ESA should include clear guidelines concerning hunting practices, management, and outreach to facilitate biocultural diversity protection.

Figure 5: Artwork Kaitlin Ngeremokt (left, top right), meme Prutehi Litekyan (bottom, right).

Most participants would like to eat *fanihi* again once the populations are restored. Protection of limestone habitats, snake suppression, and restoration of limestone

forests are important to recover the species and make sustainable harvest possible, led by scientists. The goal of several natural resources managers is to allow for sustainable *fanihi* harvest once the populations are not threatened anymore. When people would be allowed to propagate *fadang*, grow them and take care of them, they can also harvest seeds and use some to augment recovery efforts (personal communication, R. Quitugua, 2019). Therefore, it is important that these regulations are incorporated in the endangered species recovery plans. A council of traditional knowledge holders and scientists can guide the development of the rules and regulation, and advise on implementation.

> It is nice to see the fruit bats in the wild, but the real goal, for most Indigenous people, is to have the fruit bats back so we can allow for sustainable harvest, like we did in the past. This has always been my personal goal (personal communication, D. Lujan, January 28, 2020; November 12, 2020).

> The cultural harvesting of fruit bat may only occur after the recovery of fruit bat populations on Guåhan. It is imperative to maintain habitat (not one that is piecemeal rather continuous) for a fruit bat refuge. A system with established rules and regulations must be in place and effectively enforced. An acceptable harvest will be one away from a fruit bat colony. The harvest should be restricted to only traditional methods. The harvesting must perpetuate methods of our ancestors to truly identify this as "CHamoru" culture while maintaining conservation practices as our ancestors did during their time (personal communication, J. Quitugua, May 21, 2018; November 18, 2020).

Conclusions

The answer to the guiding question for our study, "Are the traditional practices tied to endangered species at risk of being lost?" is affirmative. The age-cohort analysis showed that only people above the age of 45 had eaten *fadang* or *fanihi* and remembered the taste. The *manåmko'* (55 years and older) also *remembered* the practice of gathering, hunting, processing, preparing, and sharing of these foods. The participants in this cohort added other dimensions to the stories about the species' existence. First, the description of the taste and smell and the joy in their voices when talking about this experience was extraordinary. Secondly, the *manåmko'* talked with excitement about the way they prepared the *fadang* with family members and guests and shared the *titiyas* in small circles, while the *fanihi* was a prime dish at *fi'estas*. People between the age of 45 and 55 years remembered the taste or smell of *fanihi* or *titiyas*, but their sentiment towards them was rather mixed. Many of them recalled the gathering, hunting, and processing practices. This age group stopped eating *fanihi* and *titiyas* at a young age. This cohort only recalls sharing *fanihi* in a smaller family setting or in the back kitchen at a *fi'esta*, as these foods were becoming rarer. It was noticeable that the younger people, between the age of 25 and 45, who never prepared these foods nor ate them, nevertheless knew about the use and had

a basic knowledge about the *fadang* seed processing technique, illustrating their fascination with the process and their desire to taste it. The *manåmko'* emphasized how family members gathered to process seasonal foods such as breadfruit and food that can be stored for later use such as *fadang*. Food security was a necessity after WWII. Nowadays, although people still share endemic or native foods at their home and during a *fi'esta* or a *gupot,* their inclusion in local diets is slowly disappearing because the use of traditional seasonally stored food is disappearing as modernization and globalizations make imported food items convenient, plentiful and available year-round. Today's society is also threatened with food insecurity, increasing reliance on imported goods. Younger people recognize the urgency of food security and are engaged in growing their own food, learning local food recipes tied to the culture and local practices, illustrating the re-discovery of endemic and native foods, making their *manåmko' proud*. They value local customs of gathering, processing, and preparing endemic and native foods. People's desire to maintain these practices and knowledge is strong. Endemic foods have the potential to significantly contribute to food security and conservation on Pacific Islands.

It is important to recognize that Pacific Islands in the twenty-first century have the challenging task to balance two contrasting world views concerning preservation of the land, its species, land sovereignty, and the perpetuation of TEK practices. While TEK knowledge is a holistic way of knowing and interacting with the natural world, SEK maintains a reductionistic and analytical viewpoint based on scientific facts (Kimmerer, 2015; Snively & Williams, 2016). Activism has a central role in protecting cultural practices and the natural environment. Interdisciplinary research has advanced conservation and biological diversity research by including linguistic, cultural, human rights, and policy components (ØStreng, 2010). Scientific-led conservation can coincide with sustainable harvesting practices when incorporated in recovery plans. A council, guided by a co-production of knowledge of SEK, TEK, and activists can outline these harvesting practices and their implementation. The CHamoru value system can assist with outreach and sustainability by emphasizing the importance of sharing and knowledge transmission. These stories advocate for protecting and restoring TEK and making them part of the endangered species recovery.

We want to emphasize there is more at stake when dealing with endangered species than the species itself. The stories of the *fadang* and *fanihi*'s taste, smell, the sharing of the dishes prepared by the CHamoru people, and the knowledge transmission on how to prepare the dishes are a different way of knowing the Mariana Islands environment. The stories capture the CHamoru culture which connects with the islands' unique flora and fauna. Telling these stories of food and recording recollections of taste and smell are part of CHamoru food heritage. The stories bring forward the sense of the environment as a different sense of loss, as compelling as the loss of a species in an ecosystem. Elders who hold these memories, fear this way of knowing a species will not be passed on to their children and grandchildren. Because the species are rapidly declining, the CHamoru people can no longer enjoy this sense of place, uniquely tied to the Mariana Islands. Therefore, it is important to

acknowledge that once we protect the native and endemic fauna and flora of the Mariana Islands, stories can assist in preserving the knowledge on how to procure, process (and leach out the toxins), and prepare these foods safe for consumption.

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I (Else Demeulenaere) dedicate this paper to my neighbor Rosalind Paulino Dydasco and thank her for sharing her stories, food, and wisdom with our family. Si yu'os ma'åse' to all participants for sharing your stories of taste, smell, and practice. It is my hope that part of the *fanihi* and *fadang*'s taste and smell is preserved in words and that we can find ways to preserve Guåhan's biocultural diversity. Thank you to Dr. Kevin Jernigan for your guidance during this research.

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Humility and Pride

Debra T. Cabrera
University of Guam

What does Pacific Island/Oceanic wisdom mean to you?

During my childhood on Saipan and Majuro, I had my first lessons on humility and pride. The state of harmony and consensus, and a certain level of wisdom, cannot be reached with pride. Humility is necessary if you want to listen to differing perspectives and work toward common ground, creating harmony with others. Pride closes your heart and mind to what others can teach you. Only though humility will you be aware of your own failings, allowing you to move closer to learning from others what you do not know or cannot do for yourself and your community.

How/why do you bring island wisdom into your scholarship?

My acceptance of the value and enduring strength of humility has shaped how I approach my students and research. On the first day of every semester, I am the most anxious one in the class. I am confident as an educator, but at the forefront of my mind are several questions, "What agreed-upon lessons can we teach each other? Will our collective sociological imagination grow exponentially? What are their weaknesses, and can I help? Can they help me with mine?" With participants and colleagues in my research, the approach is the same: We can learn from each other.

Using Local Early Action Planning (LEAP) to inform Climate Change Vulnerability Assessments – Guam 2019

Romina King, Marcel Higgs III, Kaylyn Bautista, and Edward Leon-Guerrero
University of Guam

Abstract

Local Early Action Planning (LEAP) is a tool developed by the Nature Conservancy to engage communities in creating place-based climate histories meant to inform natural resource managers and decision makers about community concerns, perceptions, and collective knowledge. The tool was used at the All Planners Climate Change Workshop, held in Tumon, Guam on 08 April 2019 which resulted in a Guam Community Climate Story/perceived historical timeline. Findings indicate that participants mark their climate histories with strong typhoon events that have caused severe damage to Guam. Future adaptation planning should have a considerable emphasis on reducing risk of typhoon-related damage, facilitating post-typhoon recovery, and increasing general island resilience.

Introduction

Climate change may arguably be the greatest environmental challenge of this generation. Small islands states are usually the most vulnerable to climate change; they currently and will continue to bear the brunt of the projected impacts (Mimura et al., 2007, IPCC 2014). Yet they are the least responsible for these impacts—small islands produce very low greenhouse gas emissions (Mimura et al., 2007, IPCC 2014).

Key Terms and Concepts

Vulnerability refers to the degree to which people or anything they value are susceptible to, or are unable to cope with, the adverse impacts of climate change (IPCC, 2014a). There are three dimensions of vulnerability to climate change: exposure, sensitivity, and adaptive capacity (IPCC, 2014a). Exposure refers to the 'presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social or cultural assets in geographical locations that could be adversely affected' (IPCC, 2014a). Sensitivity refers to 'the degree to which a system or species is affected by climate variability or change' (IPCC, 2014a). Adaptive capacity refers to 'the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantages of opportunities, or to cope with the consequences' (IPCC, 2014a).

Impacts of climate change include but are not limited to: sea-level rise and subsequent increased inundation from storm-driven waves, surge, and tides; shoreline erosion; changes in rainfall patterns and subsequent impacts on surface and groundwater quality and availability; increased sea surface temperatures and

subsequent increased coral reef bleaching events (IPCC, 2014b). Societies will have to adapt accordingly. Adaptation may be defined as 'an adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts' (IPCC, 2014a). Pacific island communities' cultures have evolved to deal with natural environmental impacts for thousands of years which have resulted in traditions and practices that collectively safeguard most of society (Mcleod et al., 2019). While the pace of environmental change is much faster than the past (IPCC, 2018), small islands will continue to adapt, as they have for centuries. As they do, they can augment traditional ecological knowledge, with the best available scientific knowledge to further inform their decision making.

Ideally, proposed climate adaptation policies are best, when rooted in science. Evidence-based decision making has been a tenet of the United Nations Sustainable Development Goals (SDGs), including SDG goal 13, 'taking urgent action to combat climate change and its impacts' (Lubchenco et al., 2015). However, while scientific knowledge is important, there are 'multiple ways of knowing', including indigenous ecological knowledge, that could further inform and co-produce science, a policy, or an intervention pertaining to climate change adaptation. Berkes (2009) recognized the value of indigenous knowledge and understood it as a 'process' (i.e., a way of observing and making sense of new information), as opposed to a body of information, which it may also be. Similarly, science is viewed as both a process and a body of knowledge, or *scientia*. Berkes (2009) also advocated for the partnership of traditional knowledge and science and illustrated this successful pairing in his examination of the conservation of the *Puffinus griseus* (i.e., a bird referred to as the *titi,* in Maori).

For successful climate adaptation science and policy, it is important to regularly and systematically include indigenous peoples' traditional ecological knowledge, alongside scientific findings. Proposed adaptation interventions will be ineffective without any understanding of 'place', particularly the social systems and values of island societies (Barnett & Campbell, 2010). Hay (2013) reasoned that a fundamental step in building social and ecological resilience to threats of climate change is having an understanding of the impacts at the community level. That understanding should encompass local knowledge, practices, experiences, and observations, especially from but not limited to, elder community members. It should not be restricted to scientific literature that is usually difficult to access or not easily comprehended. While Guam is the most modernized and demographically heterogenous island of Micronesia, the indigenous population identifies as CHamoru. Adger et al. (2011) strongly advocated that community input needs to be factored into decision-making on climate change. For example, prehistoric CHamoru housing structures were elevated on *latte* stones (Thompson, 1940). Elevating current and future coastal houses and buildings would be an excellent proposed adaptation to consider for sea level rise.

Community-Based Adaptation (CBA)

These inclusive concepts are embodied in community-based adaptation (CBA). CBA is a community-led process, based on the priorities, needs, knowledge, and

technical capacity of a community (Reid et al., 2009). It aims to empower people by augmenting local, experiential, knowledge about environmental trends and changes, with the best available scientific information (e.g., climate models), so that they may plan for and cope with the impacts of climate change. Risk associated with climate change may be reduced with a well-informed community directly involved in the planning and implementation of adaptation (Forsyth, 2013). CBA has an emphasis on the social, political, and economic drivers of vulnerability (Forsyth, 2013).

CBA is used internationally and places the concerns, values, and knowledge of the community at the center of planning for impacts of climate change. For example, Cochran et al. (2014) proposed a five-prong approach in Alaska to better include local wisdom in adaptation planning: engage communities in actively forming solutions; promote an environment that values multiple ways of knowing; assist communities in adaptation interventions; form lasting partnerships that intersect indigenous and western perspectives; and encourage networking on multiple scales (i.e., local, federal, regional, and international) to better access resources and share solutions. Dujardin et al., (2018) showcased a CBA process in Bohol, Philippines that incorporates aspects of the approach outlined by Cochran et al. (2014), but with a focus on experiential knowledge. Like Alaska and the Philippines, Guam will also have to adapt to impacts of climate change, such as sea-level rise, changes in precipitation, and increases in air temperature (Grecni et al., 2020).

Local Early Action Planning (LEAP)

In an effort to incorporate CBA in Guam, the Local Early Action Planning (LEAP) tool was utilized by the Nature Conservancy, with support by the Pacific Islands Climate Adaptation Science Center (PI-CASC), at the request of the Guam Coastal Management Program during the All Planners Climate Change Workshop, held in Tumon, Guam on 08 April 2019. TNC facilitators guided participants in generating a climate 'story' from a perceived historical climate timeline, that would inform the *Vulnerability Assessment of Built Infrastructure near Coastal Bays using three Sea Level Rise Scenarios—Guam* recently published by King et al. (2019) and initiate dialogues with local and federal planners. This was not the first time LEAP was utilized in Guam. In 2014, TNC facilitated an intimate, intensive one-week LEAP workshop focusing on the climate stories of two villages of Guam—Umatac and Tumon (Leberer & Gombos, 2015). The 2019 workshop included more participants from more organizations, but was a far shorter and less involved experience (Table 1 and Table 2).

LEAP is a tool initially developed by the Community Conservation Network (CCN) for the Pacific Islands Managed and Protected Area Community (PIMPAC) (Wongbusarakum et al., 2015). LEAP's primary purpose is to assist island communities in effectively planning adaptative measures to climate change impacts with an emphasis on nature-based solutions, within the context of their traditions and values (Gombos & Wonbusarakam, 2019). It was designed for less modernized islands but it may be adapted for more developed places, such as Guam. Facilitators can use the LEAP tool to engage key stakeholders from various sectors within the same community

by convening them in a communal space; conducting a participatory exercise; and documenting and discussing the results. The ideal outcome is a shared "story" (Gombos & Wonbusarakam, 2019) written by the community, that serves to initiate meaningful dialogues about their understanding of how climate has changed, how they have responded to climate events in the past, what knowledge gaps they may have, and what resources are needed in order to respond to future events. The "story" may also reveal which social and ecological resources are of the highest value as well as which climate and non-climate threats are of the utmost concern. Wonbusarakam et al. (2015) have defined LEAP as a four-step process:

1. getting organized for awareness and planning,
2. understanding climate change and the community's climate story,
3. field based threat and vulnerability assessment, and
4. finalizing the community's Local Early Action Plan.

Only the first and second steps are relevant to this paper and the 2019 Guam LEAP workshop. Three and four are longer term goals.

Methodology

Approximately 90 community members from various organizations representing government, academia, local and federal natural resource agencies, private businesses, and tourism participated in the LEAP portion of the All-Planners Climate Change Workshop on 08 April 2020. Participants were grouped into four tables (three tables were Guam-based residents and the fourth table consisted of CNMI residents) and provided recording materials. The LEAP session occurred toward the end of the workshop and by then, approximately 45-50 attendees remained. After a brief general overview about the potential impacts of climate change on Guam and the Marianas Islands, groups were given instructions and time to create a climate story, in the form of a historical timeline for Guam and the CNMI. Participants worked from their collective memories and did not use modern technology to verify any dates. PI-CASC research assistants digitized the final timelines which consisted of sticky notes on large sheets of paper in a perceived chronology, from each group using Microsoft Excel and Word. The three Guam-focused timelines were consolidated into one Guam Community Climate Story/perceived historical timeline (Figure 1). For this paper, the CNMI timeline was omitted, because Guam is the focus. PI-CASC research assistants searched online databases, archival records, and peer-reviewed articles to cross-check the information in the final perceived historical timeline and added their search results as a timeline of documented natural disasters that affected Guam (Figure 1). The final perceived historical timeline includes the major events Guam's climate story compared with documented events that occurred during that time frame (Figure 1).

Results and Discussion

The main results for Guam of the LEAP exercise are two timelines juxtaposed in Figure 1 augmented with a rudimentary analysis of general observations of

participants' interactions during the workshop. The Guam Community Climate Story indicates that residents delineate their collective climate history by major typhoons[1], particularly the ones that resulted in significant damages to infrastructure, caused great personal discomfort and duress, and have high recovery costs (Figure 1). Twelve major typhoons from 1970 to 2019 and their respective details were noted in the Community Climate Story (Figure 1). Participants had a relatively high degree of accuracy in terms of the years the typhoons occurred, indicating how memorable those cyclones were (Figure 1). Participants did not mention 37 other typhoons that affected Guam during that same time frame (Figure 1). Clearly, these less powerful typhoons did not cause as much damage as the ones noted on the Community Climate Story and possibly were not worth remembering (Figure 1). A powerful typhoon can be a traumatic ordeal that can leave lasting psychological scars. For example, Super Typhoon Haiyan, one of the strongest tropical cyclones recorded in history and the most destructive storm to make landfall in the Philippines, caused short-term and long-term physical, psychological, and social problems for Filipino survivors (Hugelius et al., 2017). Chan et al., (2016) found that Filipino survivors of Super Typhoon Haiyan had higher symptoms of post-traumatic stress than those that did not experience the storm.

Surprisingly, the workshop participants did not mention other observed changes in vegetation, harvests, precipitation, and temperatures. Nor, did they remark on the El Niño Southern Oscillation (ENSO), the primary natural climate driver of rainfall, drought, and cyclonic activity for Guam. The omission of these phenomena may be explained by lack of awareness. Or perhaps the topic of typhoons overwhelmed the discussion, leaving little room to consider other thoughts. It is unknown why these topics were omitted; participants were not interviewed about their experience after the workshop. This is a stark difference from the issues brought forth from a LEAP workshop conducted in 2014 on Guam (Leberer & Gombos, 2015) (Table 1). Table 1 includes the prioritized climate impacts of 2014 and the major discussion topics of 2019. Table 2 provides a general comparison of the two workshops. While the 2014 LEAP Workshop had fewer participants, and tropical cyclones were a main discussion point, there was a far greater number of topics brought up (Table 1) and discussed in further detail.

Additionally, in 2014 and 2019 stakeholders did not mention the Northern Guam Lens Aquifer (NGLA), the island's primary source of freshwater, or Fena Reservoir, as a topic of concern. Gingerich et al. (2019) found that Guam's water resources in a future climate condition (2080–2099) are projected to diminish relative to today's known climate. Projected future average temperature increases coupled with average rainfall decreases will lead to reduced streamflow in southern Guam and reduced groundwater recharge to the Northern Guam Lens Aquifer (NGLA) (Gingerich et al., 2019).

[1] Typhoons are defined as tropical cyclones with maximum sustained winds reaching 74 mph or 119 km/h.

Observations

In addition to the Guam Community Climate Story timeline (Figure 1), informal observations were recorded during the LEAP session. Topics discussed within the groups included, typhoons, public infrastructure, private development, coral reef bleaching events, earthquakes, wildfires, plane crashes, and PCB contaminations (Table 1).

It appears that the focus of each group was driven by the experience and education of the participants within the group which may explain the disparity of topics in Table 1. For example, Group 1's members were involved in planning, tourism, development, and private businesses and thus, their timeline included events that had a major impact on Guam's economy, such as typhoons. Group 1 spent a considerable amount of time discussing infrastructure and private development and its associated economic benefits to Guam. They were very concerned in protecting these structures from typhoons, which in turn, protects the economy. Specific developments mentioned included the Guam Regional Medical City (GRMC)[2], the Micronesia Mall, the Yigo Amusement Park, the new Dededo Farmers' Market, and the Dededo power substation, which burned in 2013. This group was also anxious about the impending military build-up[3] particularly, the inability of Guam's infrastructure to handle a large population increase.

Group 2 addressed the largest number of topics, including typhoons (Table 1). They identified ten major typhoons that had affected Guam from 1976 to the present day (Figure 1). In addition to typhoons, Group 2 recorded recent coral bleaching events, wildfires, and the polychlorinated biphenyl PCB contamination at Cocos Island Guam.[4] High levels of PCB consumption elevates the chances of cancer (Guam EPA, 2014). Their selection of events for inclusion into the Community Story indicate that ecosystem health and its linkage to human health were important.

Similar to Groups 1 and 3, Group 2 conversations around infrastructure revolved around typhoon damage, except for the brief mention of the major roadways constructed during the 1980s (Figure 1). Group 2 were the only group to reference the 8.0 earthquake which affected Guam in 1993 (Swan & Harris, 1993). They had perceived the earthquake to be an 8.2 magnitude, but the National Center for Earthquake Engineering Research recorded that it measured 8.0 on the Richter scale. Group 2 also included the 1997 Korean Air Flight 801 crash[5], although it is unclear why due to its lack of relevance to Guam's climate.

Group 3's discussion topics were dominated by typhoons and the damage that they incur. Group 3 did not stray past this subject. They delved into greater detail

[2] GRMC is the first private hospital in Guam.

[3] US Marine troops are being relocated from Okinawa, Japan to Guam from 2009 to the present and Guam may experience an increase in population of approximately 10,000 people.

[4] High levels of PCB were found in Cocos Island which is 1 mile south of Guam and is commonly used as a tourist attraction (Haddock et al., 2011).

[5] The plane crashed in Nimitz Hill, Guam and only 26 of the 254 passengers had survived (ntsb.gov, 1999).

about each of the storms and observed how the increase in FEMA involvement can be perceived as a decrease in self-reliance and greater dependence on US aid.

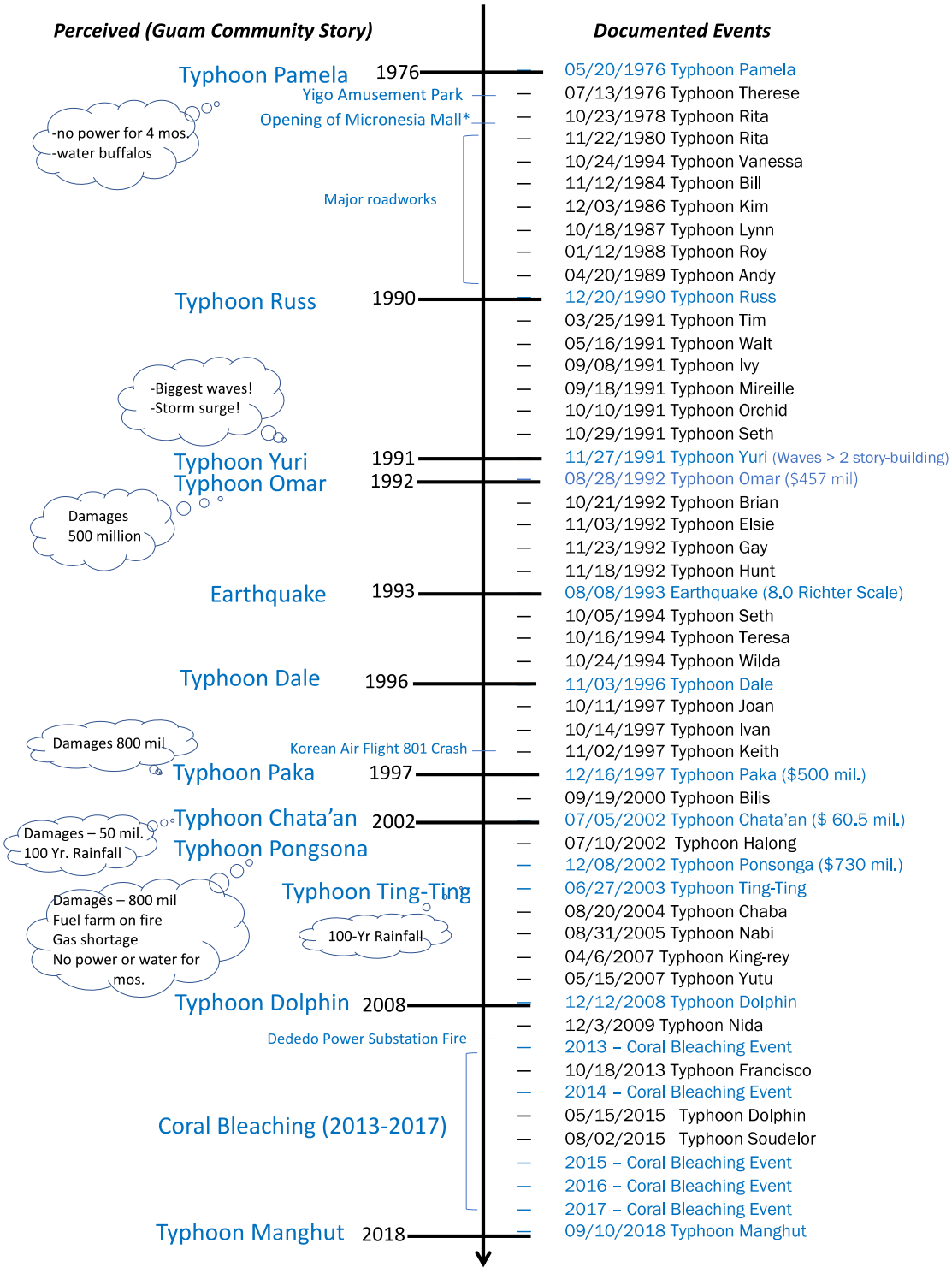

Figure 1: Perceived Historical Timeline showing the major events of the Perceived Guam Community Climate Story juxtaposed with documented typhoon passages near Guam. Guam Community Climate Story timeline was created on 08 April 2020 at the All Planners' Workshop in Tumon, GU. Timeline of documented storms was researched and generated by Marcel Higgs.

Table 1: Discussions topics according to group at the 2014 Workshop compared to the 2019 LEAP Workshop. Topics from the 2019 workshop are from Lebrerer & Gombos (2015).

Discussion Topic	2019			2014	
	Group 1	Group 2	Group 3	Umatac	Tumon
Typhoons	x	x	x	x	
Public infrastructure	x	x	x		x
Private development	x				
Coral Bleaching Events		x		x	x
Earthquakes		x			
Plane crashes		x			
PCB Spills		x			
Wildfires		x		x	
Population (Migration)				x	
Cultural impacts				x	
Shoreline Erosion					x
Flooding				x	x
Less outdoor activites					x
More pests/dieseases					x

Limitations

The LEAP tool is a response to traditional top-down approaches undertaken by the natural resource management community toward planning, and it is a direct reflection of the shift toward community-based adaptation. Forsyth (2013) succinctly outlines the advantages and disadvantages of CBA. Advantages include the likelihood of a higher success rate of an adaptation intervention, if it was supported by the community, while disadvantages include the necessary investment in time for a community to undertake this process (Forsyth 2013). One mini-session of LEAP at one workshop is not enough time to generate long-term solutions. It is a gentle reminder to planners that this tool exists and was used in 2014 and can be used again, with modifications. To maximize the effectiveness of LEAP, one should invest approximately six months to one year of intense work with a community to draft a dynamic action plan (Wongbusarakum et al., 2015) with the expectation of revisiting the plan annually. It is also important to remember that LEAP is one tool in CBA, there are many others that also aim to incorporate traditional wisdom and community input in adaptation planning (Mcleod et al., 2015).

With that in mind, results from this 2019 workshop should be regarded as quick snapshot in time because it was by no means as intensive as the 2014 Workshop. In comparing these results to the 2014 LEAP workshop, context must be considered, as provided by Table 2.

Table 2: Comparison of 2014 & 2019 LEAP Workshops held on Guam

Factors		2014 Workshop (10-14 March)	2019 Workshop (08 April)
Number of participants		33	45-50
Length of workshop		5 days	1 hour and 15 minutes
Focus Areas		Tumon and Umatac	Guam (three groups) & the CNMI (one group)
Facilitators		2	2
Activities	Overview of the LEAP management tool	yes (more in-depth)	yes (brief)
	Community Vision	Very in-depth	No
	Group Discussion	yes (longer, more in-depth and around many topics)	yes (took up the bulk of the session and centered around the historical timeline)
	Seasonal Calendar	yes	no
	Historical Timeline Activity	yes	yes
	Potential Future Impacts from Climate Change (Lecture)	yes	no (but this was discussed by the keynote speaker of the All Planners workshop @ 0930)
	Climate Indictors & Impacts	Very in-depth	General
	Climate Narrative/Story	yes (Umatac and Tumon)	yes (report out from the timeline exercise)
	Community Profile	yes	no
	Prioritization of targets of climate impacts	yes	no
	Mapping Exercise	yes (longer, more in-depth, handwritten)	no (but a satellite image of Guam with 10 ft SLR Scenario was in the front and there was a dedicated session on participatory geographic information science earlier in the workshop)
	Field-based threat and vulnerability assessment	yes	no
	Threat Action Model	yes	no
	Next steps actions and responsibilities	yes	yes

Because no demographic data were formally collected, it is impossible to determine whether the participants were a true representative sample of the population. Ideally, follow-up workshops should be scheduled to further the dialogue, expand the topics, and include more stakeholders, particularly elder CHamoru, or *manamko'*, at the village-level in order to further the dialogue and ultimately create a dynamic action plan of adaptation.

Recommendations and Conclusion

In sum, results from the 2019 LEAP session indicate that Guam residents view their climate history by major weather events, particularly strong typhoons which have caused great devastation. The Community Climate Story/perceived climate historical timeline highlights 12 typhoons from 1970 to the present day, omitting 37 typhoons which had affected Guam during the same timeframe. Based on these modest results, future adaptation planning for Guam should adequately address typhoons and emphasize the protection of property, environment, and human health. It should be emphasized that these findings are a small component of a larger technical report, Vulnerability Assessment of Built Infrastructure near Coastal Bays using three Sea Level Rise Scenarios—Guam by King et al. (2019).

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Interconnectedness in a "Sea of Islands"

Andrew Soh
Ateneo de Manila University

What does Pacific Island/Oceanic wisdom mean to you?

Reflecting on a sense of place in Hawai‘i in relation to ecological ethics has led me to realize the centrality of interconnectedness. This interconnectedness is all-encompassing and, further, extends beyond one’s *mokupuni* (island) to include *Moana Nui* (the greater Pacific Polynesian root culture). This notion of interconnectedness is echoed by the Tongan anthropologist, Epeli Hau‘ofa, who emphasized it through his description that Oceania has a “sea of islands” (Hau‘ofa, “Our Sea of Islands”). This insight is an important corrective and refutation of the individualized conception of self that is the vestige of modernity.

How/why do you bring island wisdom into your scholarship?

This insight into our interconnectedness informs my research in ecological ethics as I seek to identify and unfold the convergences between the indigenous place-based ecological knowledge (IPEK), and conservation science and natural resource management. This line of inquiry relates to the ethical aspects of the human relation to and use of the natural environment to contemporary practices of sustainability in a way that allows us to examine and reflect on the mutually beneficial relationship between the two convergent worldviews of IPEK and modern science.

The Devils of Oki-shima:
A Group of Presumed Micronesian Castaways in Japan

Dirk H.R. Spennemann
Charles Sturt University

Abstract

Accidental dispersal of Micronesian voyaging canoes is well known. While most of this occurred within the archipelagos, some was further afield. A twelfth century Japanese report narrates the arrival of a boat of castaways to the Izu Islands (off Tokyo). This paper examines this narrative against the background of other documented long distance dispersal from Micronesia, such as vagrant saltwater crocodiles and a canoe drifting from Lamotrek to Shanghai (China).

Introduction

As is well documented, Micronesians were expert seafarers, able to navigate vast expanses of water open solely by the observation of the stars and/or the swell (Daiber, 1986; Genz et al., 2009). The presence of Micronesians in the Marianas Islands during the Spanish period, for example, is well documented (cf. Barratt, 1988; Driver & Brunal-Perry, 1996). These were certainly planned voyages, as were voyages from Palau to the Philippines (Spennemann, 2020). Much of this tradition is still alive and has seen a revival in recent years (Cunningham, Kranz & Sikau, 2006; Finney, 2007; Genz, 2011; McCoy, 1973; Metzgar, 2006), commonly tied with a reaffirmation of cultural identity (Diaz, 2011).

The vagaries of the weather, especially as tropical storms and typhoons (Spennemann, 2004), however, frequently interfered with the orderly conduct of the voyage, forcing some of the canoes off course. In addition, several of the Carolinian long-distance voyages went awry, usually when the canoes were blown off course during typhoons, with canoes from Ulithi arriving in the Philippines in the 1850s (Jagor, 1873, p. 208). The German administrator of Yap, Georg Fritz (1910), for example, noted that "almost every year individual canoes are cast away to the Philippines". While such dispersal occurrences from Micronesia to nearby areas were common, some were even farther afield including the East China Sea.

One of these records is a twelfth-century Japanese report on the arrivals of what was described as foreign 'devils' on Oki-shima in the Izu Islands (off Tokyo). This paper examines this narrative against the background of other documented long distance dispersal from Micronesia, such as vagrant saltwater crocodiles and a canoe drifting from Lamotrek to Shanghai (China).

Drift Voyages from Micronesia to Japanese waters

A recent review of the occurrence of vagrant saltwater crocodiles in the Pacific examined the evidence for dispersal facilitated by the ocean currents (Spennemann, in

2021, 2020). In addition to numerous examples in the central and southern Pacific, that review also identified three confirmed (Amami-Oshima, Toyama Bay, Koamishiro Bay) and two unconfirmed observations (Iriomote-Jima, Iwo Jima) of vagrant saltwater crocodiles in Japanese waters (Figure 1) (Spennemann, 2021). The review noted that the majority of these vagrants was likely to have originated from northeastern Luzon (Philippines). Their movement was aided by the Kuroshio Current, which, flowing at a speed of about 2 knots, carries objects from the northern Philippines in an arc past Taiwan to the Southern Coast of Japan (Chang et al., 2016). The Tsushima Current branches off south of Japan and carries objects into the Sea of Japan (Figure 1). One of these vagrants, the unconfirmed Iwo Jima specimen, however, certainly would have come directly from Palau (Spennemann, in 2021). As computer simulations showed that objects from Palau drift northwards, either to the Philippines or into the Kuroshio Current (R. Callaghan & Fitzpatrick, 2008), possibly some of the other crocodiles observed in Japanese waters could have come from Palau. Similarly, the drift dispersal of tropical seeds from the Philippines and Micronesia into Japanese coastal waters (both western and eastern coasts) is well documented (Nakanishi, 1987).

Drift voyages of canoes blown off course in the north-western Caroline Islands are likely to follow similar trajectories. Typhoons and tropical storms are, and have been common, in western Micronesia (Spennemann, 2004). The storm tracks follow a similar pattern: a westward movement just to the north of the Caroline Islands, usually coupled with an increase in intensity, followed by an eventual curving off to the north and northeast (Figure 1). The point where the storm track curves northwards varies. Once the winds subside, floating objects will be pushed westwards by the trade winds and will, eventually get caught up in the Kuroshio Current.

One such, major, dispersal is evidenced by major dispersal recorded in the Imperial German colonial files. On Good Friday 1907 a severe typhoon struck the central and western atolls of the Caroline Islands. Woleai Atoll was hardest hit, with the winds stripping breadfruit trees and coconut palms, and the storm surge inundating many of the swamp taro pits, resulting in a severe food shortage (Spennemann, 2004, 2007b). To alleviate some of the effects, six canoes left Woleai for Lamotrek Atoll, some 150 nautical miles to the east, in order to reduce the number of people to be fed on Woleai and to also eventually bring back food and fresh planting stock on the return voyage. The Woleaians stayed on Lamotrek throughout 1908, planting their own crops. Early in 1909 the canoes sailed back but encountered a tropical storm. Five canoes were blown off course and eventually reached Ulithi, 290 nautical miles northwest of Woleai. The sixth and smallest canoe, occupied by five people, became separated from the others. After a 97-day, 3580 km drift voyage the canoe arrived at the Chinese coast and was found, with three survivors, just off Shanghai (Fritz, 1910) (see Figure 1 for locations). The Woleians were eventually repatriated in September 1909 (Anonymous, 1910).

The Devils of Oki-shima

This documented drift voyage of the Micronesian canoe, as the dispersal of the saltwater crocodiles, provides context to another historic record of long-distance dispersal, which had been first noted by Kōno Isamu (1942) and later publicised by the Japanologist Alexander Slawik (1955). In his paper on the discovery of a stone axe on Kita-Iwō-Jima (北硫黄島), Volcano Islands (Japan), Kōno discusses whether during earlier times ethnic elements from Micronesia might have penetrated into the Japanese sphere and left their traces (Kōno, 1942). In this context Kōno discusses an example for possible contact reported in Japanese medieval literature. The event is narrated in volume 17 of the *Kokon Chōmonjū* (古今著聞集), a 'collection of (hi)stories from the past and present,' compiled in about 1254 by Narisue Tachibana (橘成季), who was possibly the governor of Iga province at the time (Dykstra, 1992). Story n° 27 entitled 'Arrival of a ship' (Narisue, 1690), provides the following account, as reproduced by Kōno (1942)[1] and translated by Slawik (1955).

承安元年七月八日、伊豆國奥嶋[2]の濱に船一艘つきたりけり。嶋人ども難風に吹よせられたる舟ぞと思ひて。行むかひて見るに。陸地より七八段ばかりへだてゝ舟をとゞめて。鬼繩をおろして海底の石に四方をつなぎて。

"Jōan year 1 [=1171], 7th month, 8th day. A boat arrived at the beach of the island Oki Shima in the Izu province. The islanders [of Oki-shima] believing it to be a boat cast away in a storm went to see it. The boat had stopped some 7 or 8 duan [75-85 m][3] from the shore. The devils dropped ropes and fastened the boat on all four sides with stones on the sea floor.

かの鬼八人船よりおりて海に入て。しばし有て岸にのぼりぬ。嶋人粟酒をたびければ、のみくひける事馬のごとし。鬼は物いふ事なし。

Afterwards eight of these devil men descended from the boat into the sea and emerged at the shore. When the islanders offered them sake made from millet, they drank it like horses. The devils did not say a word.

そのかたち身は八九尺ばかりにて。髪は夜叉のごとし。身の色赤黒く。眼まるくして猿の目のごとし。皆はだか也。身には毛おひす。蒲をくみて腰[4]にまきたり。身にはやうやうの物かたをゑり入たり。まわりにふくりんをかけたり。をのをの六七尺ばかりなる杖をそもちたりける。

As far as their constitution is concerned, they were about 8 to 9 shaku [2.4–2.7 m] high, their hair was like that of yakshas, the colour of their bodies was red-black, the eyes round as those of monkeys. All were naked. Their bodies were hairless[5] [and] they had wound woven reed around their waists.[4] Motifs or various kinds were cut into their bodies bounded by ornamental borders. Everyone carried a 6 to 7 shaku [1.8–2.1 m] long stick.

嶋人の中に弓矢もちたる有けり。鬼こひけり。嶋人おしみければ鬼ときをつくり

Among the islanders were some who carried bows and arrows. The devils

て杖をもちて。まづ弓もちたるをうちころしつ。およそ打たるゝもの九人がうち五人は死ぬ。四人は手を負なからいきたりけり。そのゝち鬼脇より火を出しけり。

asked for them. When the islanders did not wish to part with them, the devils gave out a war cry and attacked with their sticks first those who had bows and arrows, with an intention to kill them. Of the nine people attacked, five died and four were injured but survived. Afterwards the devils released a fire from the side.

嶋人皆ころされなんづと思ひて。神物の弓矢を申出して。鬼のもとへむかひければ。鬼海に入て底より船のものに至りてのりぬ。則風にむかひてはしりさりぬ。

The islanders feared they all would be killed. They requested and brought the holy bows and arrows, and when they attacked the devils, these devils went into the sea and reached the boat via the sea bottom. They fled against the wind.

おなじ十月十四日圖解をかきて。おとしたりける帯をぐして國司に奉りたりけり。件の帯は蓮花王院の實藏におさめられけるとかや。

In the same year, 10th month, 14th day, one wrote an illustrated report and sent it together with a belt, that had been lost, to the governor. The belt is reported to have been deposited in the treasury of the Rengeō-in."[6]

Text based on Kōno (1942)

Translation based on Slawik (1955)

Kōno does not doubt that this narrative represents the landing of a foreign people on Japanese soil. He believed to recognise in the description the cultural traits of Micronesians, based on the description of the tattoos, the loincloths, the use of clubs and the lack of knowledge about bows and arrows (Kōno, 1942). Kōno argues that these arrivals were Micronesians who had been carried to Japan by the Kuroshio Current.[7] Slawik (1955) seems to concur. Given the geographical trajectory of that current however, an origin in the northern Philippine Islands, such as Luzon, is likewise possible.

Examining the Critical Descriptive Elements

Deconstructing the entry in Kokon Chōmonjū, the critical descriptive elements of the arrivals are: head hair, body hair, skin colour, eye shape, tattoos, dress, implements and reaction to bows and arrows, all of which shall be examined in turn.

Let us consider the physical features first, which requires the use of nineteenth and early twentieth century anthropological sources that include somatological descriptions.[8] The stature height, given as 8 to 9 shaku [2.4–2.7 m], is clearly clouded by imagination and exaggeration. Given that the round shape of their eyes was notable ('round as those of monkeys'), which suggests a lack of epicanthic folds, the arrivals were clearly not of Mongoloid,[9] but of Philippine or Micronesian background.[10] The

skin colour, which is given as 'red-black,' suggests again people of Philippine or Micronesian background[11] as opposed to Malayan or Vietnamese.[12]

The hair of the arrivals was likened to that of yakshas, which in Buddhist tradition are a class of nature fairies and daemons, but which can also be interpreted as malevolent spirits, ferocious-looking persons, or demonic warriors. The depiction of the yakshas varies, but tends to involve open, unruly hair, occasionally braided at the back (Misra, 1981). In this, the hairstyle differed markedly from the Japanese and Korean topknots (Choi, 2006), as well as the Chinese queue (Godley, 1994). Palauans, on the other hand, traditionally wore their hair open in long frizzy big curls, combed back and occasionally tied in a knot (Krämer, 1919, p. 302f.) (see also Hunt, 1950). Other Micronesians wore their hair long and open, occasionally tied into a tail (Lukunor: Krämer, 1935, p. 9).

The observation regarding the body hair of the arrivals is confusing. While Kōno's text states that the devils had hair on their body, Slawik's translation states the opposite. Japanese males tend to have very little facial and body hair, compared, for example, to Ainu (Hanihara, 1990) and Caucasians (Hamilton, Terada & Mestlert, 1958). Micronesian men tend to have facial hair,[13] as well as light body hair.[14] Little is published about the hirsuteness of medieval and even modern populations in the Luzon and the Philippines, heavy body hair is reported in populations on Mindoro and Palawan (Conklin, 1949). The body hair of the arrivals cannot have been extreme, however, as otherwise the commentary would have made reference to monkeys or other animals (as it did for the eyes).

Let us now turn to body ornamentation and material culture, i.e. tattoos, dress, implements and the reaction to bows and arrows. While tattooing has traditionally also been practiced in parts of the Philippines (Salvador-Amore, 2002), tattoos, in particular large chest and full body tattoos were common throughout Micronesia as a social and ethnic marker for men (e.g. Eilers, 1935; Eilers, 1936; Krämer, 1926, 1935, 1937; Spennemann, 2009). The lack of dress bar loin cloths ('all were naked') clearly set the arrival apart from the cultural norms of the Oki-shima islanders. The arrivals had 'had wound woven reed around their waists', which suggests, woven mats, grass skirts and loin cloths woven from *Pandanus*, which were of course the common dress style throughout Micronesia (e.g. Eilers, 1935; Eilers, 1936; Krämer, 1926, 1935, 1937). Clothing made from banana fibres, which dominated in the Philippines (Mintz, 2017), resembles in its fine weave flax and like fabric, and does not correspond with the description of 'woven reed.'

The description that every one of the arrivals "carried a 6 to 7 shaku [1.8–2.1 m] long stick" suggests the use of spears as long clubs are absent in Micronesia and the Philippines. Traditionally, spears were common in parts of the Philippines (Krieger, 1926) and also in use in Palau (Krämer, 1926, p. 120f.). The reaction to bows and arrows is more complex. Kōno (1942) interprets this as a desire to obtain items that were unknown to the arrivals. The same text, however, can also be interpreted as a desire to obtain the bows and arrows as weapons for their own defense. While the use of bows and arrows is absent in the Western and Central Carolines (Eilers, 1935, 1936; Krämer, 1935, 1937), they were common in the Philippines (Amazona, 1951; Krieger, 1926;

Rahmann & Maceda, 1955). They are also on record in Palau, where they were primarily used for bird hunting (Krämer, 1926, p. 67ff.).

While the majority of the descriptive elements of the arrivals may originate from either area, some elements are diagnostic. The loin cloth made from 'woven reed' strongly points to Micronesia as does the long and curly head hair and the commentary on body tattoos. The only counterpoint is the commentary on body hair. While facial and thoracic hirsuteness is on record for some communities in mid-twentieth century Mindoro and Palawan, these locations are on the western side of the Philippines and therefore unlikely source islands (Figure 1). Given that Japanese males tend to have very little facial and body hair, any observable body hair was deemed remarkable. Micronesian men exhibit facial and, albeit light, body hair.

Conclusion

Given the above discussion, there can be little doubt that the narrative in *Kokon Chõmonjū* refers to a group of castaways from either the Philippines or Micronesia. On balance, it is more likely that the vessel came from Western Micronesia, probably Palau. This Japanese narrative, when combined with the evidence of vagrant saltwater crocodiles, the drift of plant matter and the 1910 record of Micronesians drifting to waters off Shanghai, highlights that the southern Japanese islands were exposed to random contacts with the Southern Seas.

As far as we know, these contacts went only one-way until the second half of the nineteenth century when Japanese traders developed formal connections with the northern Mariana Islands (Spennemann, 2007a, 2008) and western Micronesia (Hezel, 1994), as well as engaged in the exploitation of seabird populations in the Central Pacific (Spennemann, 1998a, 1998b). All historic records of vessels drifting away from Japanese waters relate to trans-Pacific drift (Kakubayashi, 1981), with no evidence of drifting directly to Micronesia.

We can only speculate what happened to the devils of Oki-shima after they boarded their canoe again. Given that they had drifted all the way to Japan suggests that their sails (or mast) had been damaged, preventing them from sailing back to the waters they knew. If they kept on drifting, the currents would eventually have carried the canoe across the Pacific to the coasts of Washington or Oregon, or to Hawai'i as rafting evidence from the Sendai earthquake of 2011 has shown (Carlton et al., 2018; Eernisse, Draeger & Pilgrim, 2018). Whether the crew would have survived such a trip is unknown. The level of thirst they demonstrated when offered sake suggests that their ability to obtain rainwater was low, as was their ability to osmotically absorb water through the skin (while immersed in seawater between the hull and the outrigger). This does not bode well for the chances of their survival.

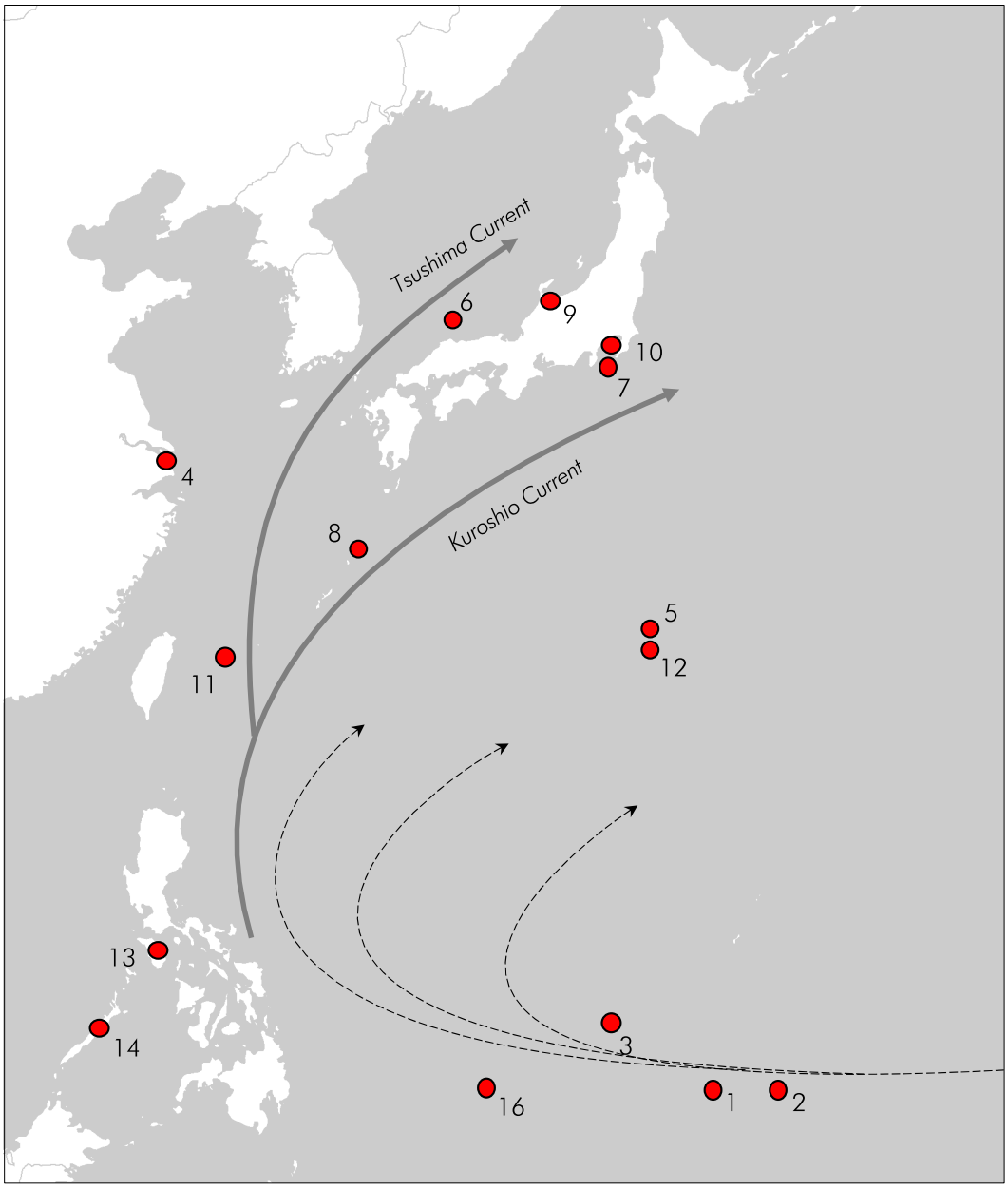

Figure 1. Map of locations mentioned in the text. The dashed lines indicate schematic typhoon tracks. 1 Woleiai; 2 Lamotrek; 3 Ulithi; 4 Shanghai; 5 Kita-Iwō-Jima ; 6 Oki-ni-shima; 7 Izu Oshima; 8 Amami-Oshima; 9 Toyama Bay; 10 Koamishiro Bay; 11 Iriomote-Jima; 12 Iwo Jima; 13 Mindoro, 14 Palawan; 16 Palau[15]

Endnotes

1. The various imprints of Kokon Chōmonjū differ slightly in their text.
2. Kōno annotates the text 奥嶋 (Oki Shima) as 'ォキノシマ' (Oki-no-shima), which on face value would place the location on the western side of Honshu, as part of the Oki Islands, Shimane Prefecture. The text, however, states clearly that Oki Shima is part of the Izu province, which is on the eastern side of Honshu, facing the Central Pacific, and the Ogasawara island chain. There is also Izu Ōshima (伊豆大島) in the Izu Islands group, which while now part of Tōkyō Prefecture was part of the former Izu province. Slawik (1955), on the other hand, speculated that the island may have been Onbasejima (恩馳島, also in the Izu Islands. The island is comprised of two sub islands, the north-eastern of which is commonly called Ojima (オジマ).
3. While in recent usage 段 duan (tan) refers to a unit of area measurement (1 duan = 991.7m^2), during the Edo period 段 was also used as a measure of length, where one duan was equivalent to six 間 ken (*i.e.* 10.91 m). The reported distance from the shore was therefore 76–87 m (in the translation rounded to 75-85 m).
4. Kōno's footnote (his nº 3) reads: 岩波文庫本「古今著聞集」には「蒲をくみて煙にまきたり」とあるが、國史大系本には「腰にまきたり」と爲って居る。"Kokon Chomon ju" (A Collection of Tales Heard, Past and Present), a book of Iwanami Bunko, says 'I picked up a bulrush and threw them into smoke,' but Kokushi Taikei-bon (Japanese History Series) says that picked up a bulrush and wrapped it around my waist.'
5. Kōno's text states that the 'devils' had hair on their body.
6. The Rengeō-in (蓮華王院) (also known as Sanjūsangen-dō) is a major Buddhist Temple in Kyōto.
7. Kakubayashi (1981) has compiled data on Japanese drift records, but these are confined to drift voyages emanating from Japan (see also Braden, 1976; R. T. Callaghan, 2003).
8. The anthropometric and somatological research during the nineteenth and early twentieth century had, of course strong racial motivations and undertones, that justifiably have been widely criticised (e.g. Ariffin & Binti, 2019; Lorimer, 1988; Smedley & Smedley, 2005). For the purposes of this assessment of somatological characteristics, however, publications derived from somatological research form a valid resource.
9. For epicanthic folds among Chinese, Japanese, Korean and Malay see (Boo-Chai, 1962; Lu et al., 2017)
10. For the eye shape of people in the Philippines see (Anies et al., 2013; Barrows, 1910; Demayo et al., 2010), for Palauans see (Krämer, 1919, p. 303) for outer islands of Chuuk (Krämer, 1935, p. 9).
11. It should be noted, though, that given the extensive inter-Micronesian voyaging, there is a considerable variation in skin colour. See commentary by Petersen (2007). —Krämer (1935, p. 9) generalised and described the skin colour of the population of Lukunor (outer islands of Chuuk) as 'chestnut brown'.
12. For skin colour of Chinese see (Xiao et al., 2012), of Japanese see (Wagatsuma, 1967).
13. Palau (Krämer, 1919, p. 303); Lamotrek (Krämer, 1937, p. 10); Fais (Krämer, 1937, p. 304); Woleai (Krämer, 1937, p. 220).
14. Palau (Krämer, 1919, p. 303).
15. Deanna Duffy (Spatial Analysis Network, Charles Sturt University) kindly produced the underlying base map for Figure 1.

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Wisdom is Aloha

N. Kauʻi Baumhofer Merritt
University of Hawaiʻi – West Oʻahu

What does Pacific Island/Oceanic wisdom mean to you?

Pacific Island wisdom means honoring – rather than just remembering – the wisdom of our ancestors as well as the wisdom of all the creatures and entities we share this earth with. It means honoring our place as both descendants and ancestors. It means voyaging out into the world in our literal and figurative canoes to share the legacy of aloha with the world.

How/why do you bring island wisdom into your scholarship?

About a year and a half ago a mentor of mine told me that she truly believes aloha will one day save the world. I knew she was right; I just didn't think that our opportunity would come so soon. The crises we are facing as a society are a warning that we have let aloha begin to slip through our fingers. It is imperative that we instill a sense of deep aloha back into our communities.

Where Our Feet Fall:
A Hula Journey into Knowledge*

Sharon Māhealani Rowe
University of Hawai'i at Mānoa

Abstract

In this paper I present my vision of a Hawaiian epistemology as I have found it through my studies as a *haumana hula* (hula student). In this context I have experienced an approach to knowledge best compared to a virtue epistemology. In taking up this pairing my point is not to use western philosophical parameters as a measure of the worth of Hawaiian thinking, nor to find out where Hawaiian epistemological thought fits into a western conceptual map. Rather, I hope to open up the philosophical discussion to alternative points of view that can expand and enrich epistemological thinking by including, on its own terms, a perspective that presents Hawaiian thought as a partner in exploring how cognitive success is identified and experienced. This approach offers virtue epistemology theorists a concretely lived method that demonstrates some of its key theoretical points. And, by engaging virtue epistemology, Hawaiian epistemology can connect with a cross-cultural companion that draws its contribution into broader dialogue, not only about what constitutes knowledge, but about its goals and the means by which knowledge is engendered, nurtured and validated.

Keywords: Hawaiian epistemology, virtue epistemology, hula, knowledge.

Before beginning I would like to explain something of my path to this essay. As I began my academic study of Philosophy I found that taking up the physical disciplines of different cultures allowed me to experience their unique sensibility of being and knowing in other than strictly intellectual terms. I found in each a unique practice that provided a portal of entry to a set of values, a way of knowing, and a mode of being. In this regard hula revealed itself as more than a dance form. It presented a philosophical text of continually unfolding layers, an invaluable epistemic resource that continues to disclose its insights as I am able to read them. I am a *haumana hula*, a student of traditional hula. I have had the privilege of studying with two *kūmu hula* (hula teachers) from the same tradition for more than twenty-years. I continue to practice with hula sisters to remember and explore the repertoire we have been taught. But I do not speak for any tradition or practice. I present only my own *mana'o* (thoughts, perspective) drawn from my practice and my reflections as a philosopher. If any of the claims I make misconstrue Hawaiian customs, culture, or thinking, the error rests with me.

While my hula practice is the grounding for this effort, I also weave in the work of native scholars, practitioners and others who have been companions for my thoughts and who helped lay the path for this vision. I begin with a brief summary of contemporary virtue epistemology and establish *ka 'imi loa* (the long search) as an epistemological goal within Hawaiian thinking. I then present my view of a Hawaiian epistemology organized around four primary pillars, drawn from my studies of hula.

Virtue Epistemology

Virtue epistemology focuses its questions about knowledge on the qualities that make someone a reliable, or responsible knower. It draws attention to the "dispositional properties of persons that bear on the acquisition, maintenance, transmission, or application of knowledge and allied epistemic goods such as truth, justification, warrant, coherence and interpretive fineness" (Roberts & Wood, 2003, p. 257). Less driven to consider the logical relations among truth claims and the often-privileged status by which knowers stand in relation to those claims, virtue epistemologists turn their attention to the knowers themselves, to the context and normative contours of knowing. Given this shift in how knowledge is investigated we avoid what Catherine McKinnon labels as "the fallacy of epistemology," wherein "[t]he less the subjectivity of the knowing agent intrudes, the more unsullied and more value-neutral the facts are, the purer the knowledge is" (McKinnon, 2003, p. 227). This kind of thinking has long fostered the notion that knowledge can and ought to be completely objective by allowing the knower to be effaced by facts and by the means through which the fact status of truths is conferred. In contrast, virtue epistemologists are willing to acknowledge a knower's identity, interests and unique point of view, accounting not only for the manner in which beliefs and knowledge are acquired, but also the way in which they are culturally expressed and nurtured.

Virtue epistemologists approach questions of knowledge analogously to the way virtue ethicists approach questions of human goodness as they apply to character and behavior. Both look to personal qualities or character traits, motivation and purpose, rather than abstract principles, rules and procedures, to better understand and resolve issues about what is good or right in human acting and thinking. In this respect, virtue epistemologists push into the foreground a value component implicit in concerns about knowledge. They loosely align as either reliabilists or responsibilists. Apart from the emphasis that these labels suggest, a primary difference between the two concerns what counts as, and how one acquires, intellectual virtue. Reliabilists include among intellectual virtues such inborn faculties as good memory, perceptual acuity, intuition—qualities that can be relied upon to produce successful cognition and consistently bring us to truths or accurate knowledge claims. Responsibilists, on the other hand, see intellectual virtues as cultivated character traits, such as being open-minded, having intellectual courage or tenacity, being attentive, that support an epistemic goal. McKinnon (2003) identifies three factors that distinguish responsibilists in ways that will be important for the case I hope to build. First, virtue responsibilists find the value placed upon knowledge derives from culturally specific practices and motives. It is because of the way the knower acquires her knowledge *and* because she is motivated "by a desire to find out how things really are" that her knowledge increases its status (McKinnon, 2003, p. 245). Secondly, they recognize that knowers emerge from and are in important ways regulated by a community. Knowers "reflect communal decisions about what counts as responsible exercise of cognitive faculties and traits" and "are made in the context of the normative practices of the epistemic community and the obligations to act in a cognitively responsible manner that membership in an

epistemic community imposes" (McKinnon, 2003, p. 246). Thirdly, they "argue that criteria for the epistemically best kinds of belief cannot be specified independently of the notion of the proper exercise of intellectual virtues" (McKinnon, 2003, p. 229). These points reiterate Linda Zagzebski's (1993) emphasis on the role that motivation plays in the quest for knowledge, which "leads a person to follow rules or procedures of belief formation that are known to her epistemic community to be truth conducive" (p. 181).

The attention virtue epistemology places on these issues offers a more welcoming discursive space for Hawaiian approaches to knowledge. Cultural practice, motivation, and community link to responsible acting and knowing in Hawaiian thinking. While I see elements of both camps in what counts as virtuous in Hawaiian epistemology—a fine memory and perceptual acuity, for example, are acknowledged as admirable qualities, and they form the basis from which individuals are identified, mentored and given access to specific knowledge, for example—a responsibilist orientation seems to reflect more consistently the pitch and purpose of Hawaiian epistemological thought as I have come to understand it. This approach accepts the fundamental role of an epistemic community in which passes on knowledge through a system of selection and mentoring. It recognizes more intuitive ways of assessing how knowledge is appraised and validated. To make the case that a responsibilist virtue epistemology fits Hawaiian epistemology fits I first consider what constitutes intellectual virtue and identify the epistemic goal these virtues serve.

Intellectual Virtues and Epistemic Goals

"The first thing that can be said about a virtue is that it is an excellence . . . [Its] practical importance lies in the fact that we can use it in making decisions and in evaluating others" (Zagzebski, 1993, pp. 84-85). Intellectual virtues draw forward a normative element in the way one approaches the tasks of knowledge acquisition and transmission, as well as its use and maintenance. They qualify what it means to be a good thinker and how to use cognitive faculties well. It is by the use of these faculties that we evaluate the character of those who claim to have knowledge—and important to the Hawaiian context—of those to whom knowledge is imparted. We find such traits are valued across different cultures, and they are believed to be qualities worthy of emulation. Virtue epistemologists consider integrity, open-mindedness and curiosity, as well as understanding and wisdom among these traits, either as the goal of cognitive effort or supportive of that goal. Zagzebski's list includes such qualities as sensitivity to detail, intellectual adaptability, humility, perseverance, diligence and thoroughness, as well as recognizing reliable authority, a capacity to think of coherent explanations, and insight (1993, p. 114). Wayne Riggs (2003), argues that understanding holds a central place among traits that contribute to a life of wisdom. He includes such qualities as creativity, epistemic responsibility, inquisitiveness, self-reflection, and intellectual honesty (p. 215). Reliabilists tend to favor excellences in perceptual faculties such as acuity in observation and hearing, strong memory, and responsive intuition; faculties that are reliably counted on to get us to truth. Responsibilists, on the other hand, tend

to acknowledge the cultural context in which such virtues arise and are recognized. Such qualities require cultivation—often through imitation of a virtuous person—to become settled dispositions (Zagzebski, 1993, pp. 157-158).

Hawaiian scholar, Mary Kawena Pukui identifies a *kanaka makua* as such a virtuous person, one worthy of the kind of imitation Zagzebski alludes to. "The *kanaka makua,"* she says, "is a 'mature person.' He is even-tempered. He thinks things through instead of jumping to conclusions. He takes responsibilities and cares about other people's happiness. He is kind and unselfish, generous and forgiving. He is hospitable, and he accepts hospitality with graciousness" (Pukui, Haertig & Lee, 1972, p. 295). Such a demeanor sets a *kanaka makua* apart and exemplifies the kind of character valued in a culture over-rich with virtues. Early in hula training, students learn about the qualities of *laulima* (cooperativeness), *lokomaikaʻi* (generosity, good heartedness), *pono* (virtue, moral correctness), *mahalo* (gratitude), and *aloha* (compassion, kindness). *Kuleana* (responsibility), *kūpono* (integrity), *koa* (courage), *ʻoluʻolu* (kindness, gentleness), *haʻahaʻa* (humility) are qualities valued not only in the *hālau*; they are cross culturally recognized as worthy of cultivation. Qualities such as *paʻahana* (diligence), *hoʻomanawanui* (patience, persistence) when linked with *akamai* (intelligence), *ʻike pono, hakilo pono* (acute observation), *noʻonoʻo* (thoughtfulness), *lololo* (deep thinking), and *naʻauao* (wisdom) support our efforts to acquire knowledge and to understand. When linked to the high value placed upon attentiveness, self-reflection, keen memory and observation, they introduce us to "a thinking people, a *poʻe noʻonoʻo"* (G. Kanahele, 1986, p. 64).

John Charlot (2005) explains how Hawaiian intellectual virtues and vices, expressed as pairs of correlative opposites, align with either knowledge or ignorance.

> Knowledge is connected to light and clarity (*naʻauao* 'entrails of light'); ignorance to darkness and confusion (*naʻaupō* 'entrails of darkness'). Correct knowledge, . . . is straight (*pololei*); inaccuracy and dishonesty are crooked (*ʻapakeʻe*). Knowledge is careful and neat (*maiau*); the lack of it leads to entanglement and confusion. Knowledge is faultlessly effective and moves straight to its results; the opposite is to blunder and wander without result, often with a connotation of immorality. Knowledge is calm and settled; agitation is a sign of mental overexcitement or even instability (p. 3).

We can see in the imagery of light and dark, careful and sloppy, direct and wandering, criteria for cognitive success, and an orientation toward stability and reliable outcomes. Indeed, in all its practices Hawaiian culture oriented toward results. Manulani Meyer (2003) claims that "[f]or Hawaiians, knowledge for knowledge sake was a waste of time. Everything, absolutely everything had a function" (p. 57). This strongly stated view—that knowledge cannot be divorced from its end purpose—can easily be misinterpreted to imply that *only* instrumental knowledge had value; but this would be too narrow. What is conveyed is that knowledge is purposeful and goal directed. The goal of the hula dancer is to perform and incite sympathetic response; as the goal of the planter is to produce food, or the goal of a *kahuna laʻau lapaʻau* is to heal. This might suggest a

reliabilist orientation, but the question becomes: Are these discreet purposes the end point of learning and knowledge, or are there epistemic goals that take one beyond the functional knowledge of specific practices?

Taking up this question, we quickly encounter the concept, *ka ʻimi loa*. The term ʻ*imi* (to search, to seek) is intensified here by the modifier *loa* to mean profound, deep seeking inquiry. In a famous passage, the Hawaiian historian, Kepelino observes, "*Ahu kupanaha ia Hawaii imi loa! E noii wale mai no ka haole-a, aole e pau na hana a Hawaii ʻimi loa"* (Beckwith, 2007, p. 143). The passage is challenging to translate. Charlot renders it: "Wonder heaped on wonder in regard to Hawaii searching far! Let the haole [foreigner] freely research us in detail, but the doings of deep delving Hawaii will not be exhausted (1983, p. 117).

In identifying Hawaiʻi itself as *ʻimi loa*, Kepelino uses an epithet common among Hawaiians in the late 19th – early 20th centuries (Arista, 2007, p. xi), and in his gloss on the passage Charlot (1983) discloses both a life-making enterprise and an epistemic motivation that unfold, often non-consciously, as the seeker is pulled toward deeper understanding.

> The simple, traditional movements of everyday life work their way into one's insides, gradually form one's character. One starts by going uncomprehendingly through the motions one has learned and gradually comes to an understanding that could not be formulated in words and for which one was earlier unready. One memorizes the ancient texts, and season by season, they disclose their depths. . . . The consciousness of searching explains why humility is so highly prized a virtue in Hawaiian culture. The road before one is always long, and help is always needed. On the other hand, the search is a source of authentic greatness (p. 118).

This image of the long search contextualizes Hawaiian intellectual activities (Charlot, 1983, p. 119). We see that in the seeking itself, through the effort to learn, we are led toward ever deepening and expanding knowledge, an unfolding of awareness and understanding. As knowers we do not necessarily initiate the knowing but rather receive what is to be known. This requires that we be sufficiently primed. Through a practice we come into a way of being, becoming a richer version of ourselves, acquiring both knowledge and the qualities of character that allow us to continue the effort. *Ka ʻimi loa* is a journey; a life-long process seeking both how to know and how to live in a way that is *pono* or right in relation to ourselves and our environment. "Life for the Hawaiian is *ka ʻimi loa* . . . an ever deepening appreciation of the universe into which one is born and of which one forms an integral part" (Charlot, 1997, p. 49).

We have identified an epistemic goal in Hawaiian thinking that grounds cognitive effort—it is a journey that comes to define a way of being and how to live a human life oriented toward understanding and knowledge of one's self and one's environment. Knowledge, in this context, has no fixed end point; there is no singular meaning, no final truth to be had. Rather, as Noelani Arista (2007) tells us, "a satisfying sense of knowing" for Hawaiians assumes "a multiplicity of meanings" and a "fluidity of

action and process"(p. xii). Hawaiians recognize that there is always more to know, more to absorb and understand. Knowledge is "an ever expanding experience" (Meyer, 2003, p. 67), and "[a]ll learning and experience are part of the great search, *ka ʻimi loa* (Charlot, 2005, p. xiii).

In her work, *Ka Honua Ola* (2011), hula practitioner and Hawaiian philosopher, Pualani Kanahele's intention is "to expose Hawaiian *mele* as a pursuit of knowledge"(p. xiv). Through *mele* and *oli* (chants) we experience the essential polysemy of the Hawaiian language as they mediate streams of associative, imagistic meanings that welcome multiple, simultaneous interpretations. *Mele* are the stuff of hula, the texts brought to life through dance. The juxtaposition of imagery woven into *mele* frequently requires deep cultural knowledge and an intuitive approach to interpretation. The meanings found in older *mele* have often been obscured due to the passage of time and the disruption to cultural continuity brought about by colonial dominance. In the interplay of sound, rhythm, and the flow of the Hawaiian language, *mele* contain centuries of cultural knowledge compressed into poetic verse, recording stories of the elemental forces present in the ocean, the land, and in the lives of the people who have occupied it. By interpreting *mele* through dance, hula becomes an entryway into a series of integrated, unfolding experiences and layers of meaning through which knowledge deepens and broadens as it is explored. Kanahele ends each chapter of her book with references that elicit core ideas, and with the phrase, "*ʻeliʻeli kau mai*." *ʻEliʻeli* means to "dig often," and it can take a figurative meaning of being "firmly rooted, profound, deep," with implications of reverence (Pukui & Ebert, 1986, p.41). She translates the phrase as "descend, deepen the revelation" (p. 169). Her purpose is "to move the reader's mind away from the text and into one of the many possibilities of emblematic imagery to deepen the revelation and allow the analytic mind to trigger yet another question"(P. Kanahele*,* 2011, p. 169). Here, she recognizes our impulse toward analytic thinking as well as the need to balance it. In welcoming the poetic to spark our minds to think more and arrive at deeper levels of understanding, she presents an epistemic practice that echoes the journey of seeking and discovery that is implicit in "*ka ʻimi loa*." How we "seek understanding and wisdom from a higher plane, no matter what level we are currently at" enlarges the idea that the path to knowledge never finds its end, (P. Kanahele, 2011, p. 169).

This was a lesson I learned in hula, where I encountered the constant expectation that present knowledge and understanding was merely a platform for something more, requiring connections I could not yet begin to make. We were encouraged to go beyond hula, to study and broaden our knowledge in other areas of Hawaiian culture and practice. *ʻŌlelo Noʻeau* were nuggets of knowledge that we were offered to chew on, and I incorporate several of them in what follows. *ʻŌlelo Noʻeau* are condensed bits of Hawaiian cultural knowledge, collected and collated by Mary Kawena Pukui over her lifetime. Translated as "wise sayings" or "proverbs" (Pukui & Ebert, 1986, p. 284) *ʻōlelo noʻeau* are easily dismissed as non-philosophical because they are not expressed in discursive or argumentative form. As with other Indigenous traditions, identifying *ʻōlelo noʻeau* as "proverbs" or "folk wisdom" trivializes the depth of cultural knowledge they contain, discouraging an exploration of their full epistemological implications. In this

paper they function as premises that help secure the foundation of my understanding. Hula, however, is the grounding experience for this vision, and I structure it around four pillars. The first establishes that a person's grasp of knowledge occurs on a continuum and shows a way of transferring knowledge predicated on the virtues of both the *kumu* and *haumana*. The second pillar follows from this, arguing that knowledge is effectively embodied and performative nature. This embodiment turns us toward the third pillar, which establishes knowledge as inherently perspectival and contextual insofar as one can only explore and acquire knowledge from one's own embodied circumstances. Finally, given this individual standpoint, we come back to the character of the individual knower. The fourth pillar shows how knowledge acquisition is intimately tied to correct practice, motivated by a desire to know, not for its own sake, but to maintain the cultural context of knowledge as a practice and continual journey of seeking understanding.

The First Pillar: Learning and the Knowledge Continuum

This first pillar can be expressed in the *'ōlelo no'eau, O ke kahua mamua, mahope ke kūkulu,* (first the foundation, then the posts) (Pukui, 1983, p. 268, #2459). The foundation must come first and be firm so that the structure will be solid and lasting. In *hālau* our foundation began with a basic vocabulary of steps and hand gestures that express a text, a *mele*. Like all dancers, we learn by observing movement and imitating it. Many dancers never go beyond this level of *'ike kumu* (basic knowledge), the first strata in a long continuum. Proceeding further is in the hands of the *kumu* (teacher). A *kumu* is a respected repository of knowledge and an epistemic exemplar. The term has several distinct and mutually reinforcing associations, illustrating how imagistic language embraces and reveals multiple meanings that are understood concurrently. *Kumu* means base, foundation; the main stalk of a tree; a teacher; a source; a reason (Pukui & Ebert, 1986, p. 182). As teachers, *nā kūmu* are sources and foundations of knowledge. In sharing what they know they carry cultural traditions forward. Such a title was traditionally conferred only after one had demonstrated knowledge and skill, as well as their personal commitment to *mālama* (to keep, to care for) what they had learned. As a firm trunk they provide the support that allows knowledge to branch out and seed further knowing. As transmitters of knowledge, it is incumbent upon them to negotiate whether or not, and if so what, when, and how to pass on specific knowledge. Thus, while everyone learns the *'ike kumu*, access to anything beyond this is based on the *kumu'*s judgment.

While the journey of seeking is one dimension of epistemic motivation, dissemination of what is found is another. It does no good to acquire knowledge if it is not shared. But knowledge must be handled responsibly and so a *kumu* is responsible for choosing how it is passed on. Among Hawaiian cultural practitioners we often hear, *"Nānā ka maka. Ho'olohe ka pepeiao. Pa'a ka waha. Ho'opili."* Pukui translates this as "Observe. Listen. Keep the mouth shut. Imitate" (Pukui, Haertig & Lee, 1972, p. 48). Encapsulated here are techniques of teaching and learning. We begin with observing. This skill, used throughout one's life, was valued and cultivated as a basis for any advance in thinking (Charlot, 2005). Our *kūmu hula* knew if we had observed (and our

aptitude to *be* observant) by our ability to accurately imitate nuances of demonstrated movements; if we had been listening, by our attentiveness to what was chanted and to corrections given; and our motivation, by our retention of what had been previously taught. They would judge our attitude toward learning—and our readiness for further instruction—not only based on whether we had learned the manifest level of dances, but on how we exhibited our interest and care toward what had been presented to us. The expectation was that we would remember, so that we would perform correctly.

Ho'opili is translated as to imitate, but it literally means to make close, to adhere, suggesting relationship. While all dancers learn by watching and imitating, in hula we are called upon to imitate nature in order to incite a sympathetic response. *Nānā* and *ho'opili* open a hula dancer's awareness to the larger environment. They allow her to build the platform of her knowledge and the relationships to what must be understood in order to perform hula well. The call to observe, to listen to and imitate nature as the ultimate teacher, continually divulges layers of knowledge about a wider environment as she takes in how the winds sing through the valleys, how the ocean climbs up along the shoreline, how the mountains lift our eyes skyward, how the leaves of a tree shimmer in the sunlight. Gathering and preparing materials for *lei* or instruments introduces plant life and the micro-environments that support them. This in turn encourages further observation of the seasons, the movement of rains and winds, and the passing phases of the moon. Through *mele* she learns stories of natural history and the gods, as well as social-political history. In the normal activities of *hālau* she practices the virtues of *laulima*, *mahalo*, *ho'omanawanui* experiencing the value they hold for continued learning. She moves into these directions naturally, from the single focal point of hula to draw in and connect what initially might appear disconnected.

The imperative to use our ears has broader purposes as well (see Chun, 2011, p. 85; Charlot, 2005, pp. 176-177; Meyer, 2003, p. 132;). Listening links us to myriad shades of sounds—to voices, language, and the power of words. It encourages motivation to learn, and focuses our attention as we must sometimes *lolohe* or strain our ears to hear, to really listen. *Ho'olono* implies the complementary virtue of attentiveness, as we must respond in time to what we hear. It requires *, ho'omanawainui* (patience) as we must sometimes wait and interpret the silence. It signals respect and deference to the authority of others and indicates a kind of humility (*ha'aha'a)* that recognizes the limits of our knowledge and the need to continue the path of learning.

But knowledge does not come solely by tuning into what the senses take in. Malcolm Chun takes particular note of the third directive, *pa'a ka waha*. Often this expression is translated as "shut the mouth." I first experienced this as a directive not to ask questions. Over time, I came to understand that it signaled respect and inculcated a discipline of focused thoughtfulness (Rowe, 2013, pp. 25-26). Charlot observes that questioning was "considered to be a distraction from observation, which requires more effort, engages more of the senses, imprints the information more firmly in the memory, and exercises the individual's own thinking capacity" (2005, p. 178). Chun adds to this, interpreting the directive in terms of reflection. "Instead of jumping to conclusions, it is better for one to reflect on all the options, putting experiences of observing and listening together" (Chun, 2011, p. 87). Developing skills of discernment

(*kuhi*) and self-reliance, synthesizing knowledge one's self—rather than expecting the *kumu* to answer questions outright—strengthens the epistemic capacity of the attentive knower. The word *pa'a* means "to hold, to withhold," and I came to understand the directive to mean: restrain your impulse to question until you have taken the time to consider on your own what you really need to know. Consideration of what has been taught, and what may already in fact be known are all wrapped in the call to *pa'a ka waha*. This call enhances the virtues of intellectual self-reliance and self-confidence as knowers reflect upon what they have learned, and what they can learn for themselves. Finally, when they have exhausted their personal knowledge resources, *nā kūmu* are available for *nīnau*, (questions). This practice develops self-assurance and allows "the creative process of thinking to take place" (Chun, 2011, p. 94). In the learning process *haumana* develop experiences that support the acquisition, maintenance and growth of knowledge. But equally as important, they support personal character traits that allow knowledge to develop from one's own experiences as they are tested, reflected upon and interpreted. Each knower's potential can be nurtured in a way that enables individuality and creativity to develop within a supportive knowledge community. This in turn facilitates successive generations of knowers to add to the stores of cultural knowledge.

In this first pillar we find a way of inculcating how to sense and how to be receptive in a way that secures the learning process as the fundamental platform for how to know. We approach knowledge first through our senses (by seeing, hearing, even tasting and smelling), then by developing our sensibilities (by watching and listening) and finally, in order to better understand ourselves and our place in an environment, by cultivating the capacity to reflect. We imitate what we sense, feel, and experience through embodied engagement, bringing ourselves closer in relationship to each other and the environment with the goal to engage with them as a reciprocal and sympathetic actor. Through reflection we are better able to situate ourselves with respect to how our understanding can be put into action, whereby it can be shared with others and validated. This constitutes but one of many cultural epistemological practices available to *haumana hula*. It explains how knowledge is acquired; how, through methods of constraint, it is transmitted and perpetuated, and how it can develop individually and creatively, adapting to new problems and changing circumstances. This first pillar also illustrates what McKinnon (2003) highlights in a responsibilist virtue epistemology. For while a *haumana* may be motivated to acquire knowledge, a wider epistemic community, "in the context of normative practices," both determines "what counts as responsible exercise of cognitive faculties and traits," and imposes obligations "to act in a cognitively responsible manner" (McKinnon, 2003, p. 246). In this way knowledge and understanding are passed from *kumu* to *haumana*, cultivated and played out in the performing bodies of dancers.

The Second Pillar: Knowledge is Embodied, Hence Performative

Three *'ōlelo no'eau* will help me to secure the second pillar—that knowledge is inherently embodied and hence performative. *Ma ka hana, ka 'ike* (In the work is the

knowledge) (Pukui, 1983, p. 227, #2088), *ʻIke ʻia no ka loea i ke kuahu* (The skill is known by the altar) (Pukui, 1983, p. 131, #1208), and *Ho aʻe ka ʻike heʻenalu i ka hokua o ka ʻale* (Show you can surf on the back of a wave)(Pukui, 1983, p. 108, #1013). Each expression incorporates the word, ʻ*ike*, a fundamental epistemological concept that expresses knowledge in its broadest sense, and each implies physical engagement. In hula, knowledge comes to us through our efforts as individual dancing bodies. Manu Meyer's analysis of Hawaiian epistemology teaches us three things in this context, first that "[k]nowledge is not simply an intellectual/mind experience, but a full-body, full-mind one" (2003, p. 12). This in turn tells us that "[b]ody and mind are not separate. Naʻauao teaches us this" (Meyer, 2003, p. 65). From here we understand that *naʻau* and *naʻauao* associate with a way of "'knowing' that is not divorced from awareness, from body, from spirit, from place" (Meyer, 2003, p. 180). In Hawaiian thinking knowledge is lodged in the *naʻau,* the intestines. This visceral connection draws knowledge into the core of our physical being, to experience ourselves and the world in and through the body. P. Kanahele unpacks the epistemological implications of this fundamental notion, exposing not only its embodiedness, but its intellectual and performative aspects as well. "To me," she says, "naʻauao is . . . understanding . . . not only with the level of intelligence, of thinking about it, but the level of practicum, of having done it somewhere, understanding how it works, understanding why it works" (cited in Meyer, 2003, p. 181). Understanding here derives from practice, from physical engagement. Through the effort, through the tasting (*hoʻaʻo*), comes understanding of how and why things are as they are.

The meaning of *naʻauao* combines the word for daylight, *ao*, with the term for the intestines, *naʻau*. It invokes intellectual virtues ranging from being learned and enlightened, to intelligence, knowing, and wisdom (Pukui & Ebert, 1986, p. 257). It evokes an understanding that emanates most profoundly from the physical core of our being—the source of digestion. Knowledge acquisition is thus understood as a process that nourishes us. It implies receptivity and assimilation at a cellular level, beneath conscious control. Rather than something acquired by the sheer effort of an active intellect, at a fundamental level knowledge is something that happens to us. It is something that nurtures us through a process of consumption, supporting growth and development. Knowledge, from this viewpoint, is what we become in and through our day-to-day performances, whatever activity we engage in.

Ma ka hana, ka ʻike speaks generally to the fact that knowledge is shown in the work displayed, whether it be a product or a performance. Sometimes this ʻ*ōlelo noʻeau* is translated as "we learn from doing" and is associated with "hands-on" learning. Certainly this is one layer of meaning. We learn hula by doing hula. We learn, really learn, planting by getting into the earth and planting. We learn to navigate, to surf, or to paddle only by getting into the ocean. This is basic. But knowledge as embodied performance is not kept to oneself. Indeed, as embodied, its very expression means it will be publicly displayed, seen by others, and thus shared. "A characteristic of Hawaiian culture is the active spreading, *laha,* of knowledge" (Charlot, 2005, p. 10). This tells us that we do not acquire knowledge to hold it, or claim it as our own individual possession. It is not something we discover on our own; rather we arrive at

a place of knowing only through a practice, supported by a community. It is in this sharing and the witnessing of performance by the community, that it comes to count as knowledge. I must be able to show what I know. This is the meaning of *hōʻike*, but there must be someone to show it to. While in contemporary usage *hōʻike* is often reduced to the idea of a "recital," in *hālau* it means being constantly tested. In this context *hōʻike* becomes a means of validation. Among the more significant "*hōʻike*" were informal situations in which we were called on to show what we knew. If we had returned from a workshop, or even at the whim of our kumu, certainly if we ever said we "knew," we were met with, "Ok, show me." Sometimes it was simply signaled with a slap of the *ipu* (a gourd drum) and a shout of "*mākaukau*!"(ready!) If we truly *knew* it, no rehearsal was required. *Hōʻike* thus provides a means to demonstrate our knowledge competence and our capacity to produce apt performances, thus verifying our knowledge both to the community and ourselves.

ʻIke ʻia no ka loea i ke kuahu indicates that when one knows, one can do; there is something to show for it. It is also implied that the quality of the product reflects the level of knowledge. And quality performance was expected. Implicit in this culture of demonstrating knowledge through performance, we find a striving for perfection (Charlot, 2005, pp. 122-132; Pukui, Haertig & Lee, 1972, p. 52). This feeds into the aesthetic sensibilities of Hawaiian thinking. It is not just efficiency that is admired but a style of performance as well. Care to polish a performance reflects individual effort and creativity, but also a respect for what one has learned. *Ho aʻe ka ʻike heʻenalu i ka hokua o ka ʻale* (Show you can surf on the back of a wave). Yes, there is skill here, but to be so faultless in performance that no error can be seen, reflects a dancer's abilities to observe, to pay attention to detail, and to have the patience to take the time to get it right. This demands another stream of virtues that includes confidence (*manaʻo iʻo*), courage (*koa, wiwoʻole*) and discipline (*aʻo ikaika*). It also engenders a dispositional attitude that speaks to how we care for what has been learned. Here qualities of *aloha*, ʻ*ihi* (reverence), *mahalo* (gratitude) imply a love and respect for the knowledge that has been shared.

Finally, we can understand knowledge as performative in a way that distinguishes it from the strictly intellectual. Knowledge simply for its own sake garnered no value (Meyer, 2003, p. 57). This is true across any practice. Traditionally, the imitative performance of hula dancers was intended to draw an audience of human and non-humans into sympathetic participation to achieve balance and harmony. Knowledge, as useful and productive, must perform for the betterment of the community. But this is not simply how-to knowledge. Everyone recognizes levels of knowledge, and a level of skill-knowledge is basic. While performing a simple hula shows a certain amount of knowledge, no one would recognize this alone is sufficient to describe the dancer as knowledgeable. Such a description applies to someone who demonstrates awareness and understanding, which is displayed in how and why the activity is performed. Higher levels of knowledge entail a certain disposition, reflected through how we behave, interact and communicate with others and with the environment. Knowledge at these levels is not reducible to propositional knowledge, nor is it only a how-to knowledge. It encompasses understanding that, as P. Kanahele

reminds us, incorporates awareness of how and why a thing is as it is and works as it works. While knowledge needs to be practically applicable, offering value to the community in some way, practicality can range from basic survival skills "to the highest speculation on the origin and structure of the universe that provided [Hawaiians] a mental context for their lives" (Charlot, 2005, p. 10). Knowing, here, is an understanding that requires a fuller, ever broadening context, and it sets a more philosophical framework than does strictly knowledge-how.

The model of knowledge we have, then, is that of a vital practice among individuals coming to know by creating meaning and understanding together. In *hālau* we came together to dance but also to know. At our best we performed, learned, and remembered as one body, one mind. From this I came to understand that knowledge is not the product or property of individuals but reflects a collective effort to understand, to remember, to know. As knowers, we are in some essential sense dependent on one another. Knowledge is dialogic, relational, communal. In performance it is made public, shared with a community where it can be critiqued, accepted (or not), and incorporated to a continually growing body and practice of knowledge. Performance establishes a means of verifying what and how well one knows. It also reflects back upon the *kumu* and thus upon a wider community of knowers wherein responsibility for knowledge maintenance is recognized as a broader cultural responsibility. The exacting demands placed upon hula dancers in learning and performance ensure that knowledge is acquired and maintained properly. The dancers also support an epistemic responsibility to care for the knowledge received. This responsibility is assumed by individual hula dancers and their *kumu,* nurtured and supported by traditions that comprise a larger community of knowers. It requires a willingness to respect other ways of learning and presentation that represent different traditions and viewpoints. This takes us to the third pillar.

The Third Pillar: Knowledge is Contextual and Perspectival

The *ʻōlelo noʻeau* that summarizes this pillar is one known to all hula dancers; indeed it is one of the first lessons presented: *ʻAʻohe pau ka ʻike i hālau hoʻokāhi,* (Not all knowledge is held in one school only)(Pukui, 1983, p. 24, #203). It implies that no single individual or school has a lock on knowledge or is privileged in its point of view. Knowledge is always partial, and there are many ways of perceiving the same phenomenon. This opens us to accept—and enjoy—different ways of seeing and presenting knowledge. We delight, for example, in the way a simple *mele* is performed, how its choreography re-creates the story, how the nuances in the chanting inflect different layers of meaning.

The context of an interdependent community "is at the heart of what it means to know something in a Hawaiian worldview" (Meyer, 2001, p. 135). Given that knowledge is embodied in individuals and communities as cultural practices, it is inherently perspectival—first and foremost from the individual vantage point of a unique, embodied knower. It is equally contextual—reflecting context of time, place, culture, and the experiences of the knowing individual. Once we accept that knowledge is a

matter of lived experience, coming to us through our own embodied engagement, we easily recognize the inescapable incompleteness of our knowledge. This is the lesson of *haʻahaʻa*. Often translated as humilty, *haʻahaʻa* does not imply self-deprecation; rather it conveys deference to one's *kumu* and the tradition she represents. It is a prerequisite for continued development and growth. As an intellectual virtue, it inculcates receptivity, patience and perseverance, even gratitude. It allows us to welcome the views of others to expand and enrich our own. Indeed, in this context, higher degrees of knowledge are only possible when relationships are maintained such that individual, partial knowers can come together, communicate and share. There is no place for the individual ego to rise above the practice because the practice has a purpose beyond the individual.

Laha, the spreading of knowledge, brings us to the epistemological implications in the concept, *makawalu*. Literally, meaning "eight eyes," the term is used as an epithet for someone who is aware and skilled; for example, *Peʻapeʻa maka walu* (Peʻapeʻa was "eight eyed") (Pukui, 1983, p. 288, #2621). As an epistemological method it indicates that in order to know a thing we must look at or have seen it from multiple viewpoints. P. Kanahele uses the imagery of the *hapuʻu*, a slow growing tree fern that presents itself first in tightly coiled fonds that gradually arch skyward as they open up allowing spores to spread and reproduce, to explain the broader concept of *papakū makawalu*.[1] It links epistemology and ontology to illustrate how knowledge and reality were understood and categorized vertically and horizontally in space and time (The Kohala Center). The image captures the fractal way knowledge develops from a foundational base that then opens up, spawning new platforms, which in turn support further growth and knowledge. In nature we observe such phenomena all around us. They model how knowledge continually opens up through unfolding layers, changing knowledge landscapes and our orientation in them. Most directly the idea speaks to the need to see a phenomenon from different vantage points before we can lay claim to knowing it. It also illustrates that new realities are continually being generated. It follows that knowledge too must be a continual engagement, an incessant seeking for further understanding.

ʻ*Ike i ke au nui me ke au iki*, (Knows the big and small currents) (Pukui, 1983, p.131, #1209). The message of this *ʻolelo noeʻau* brings us back to observation and the need to take the time to sit and watch in order to know. The image of ocean currents draws attention to the interplay of movement and time, to the contextuality and fluid character of knowledge. It also takes us to images of submerging ourselves in the flowing reality that brings us knowledge. Currents large and small conjure immersion, interconnection, and movement—all part of a fully embodied experience of knowing and being. In her "seascape epistemology" Karin Ingersoll (2016) draws on her surfing experiences, immersed in and embraced by the ocean, to challenge dominant

[1] P. Kanahele identifies *papakū makawalu* as a "Hawaiian method of studying and understanding the universe" (The Kohala Center). Meyer identifies it as "[a] Hawaiian interpretation and practice of interdependence" (2013 p. 98). (See Nu'uhiwa, 2019, pp. 39-49).

knowledge paradigms. She views knowledge as "an always moving interaction" (p. 15). Her *kanaka* (native Hawaiian) epistemology argues for plurality and multiplicity, for breaking down oppositions that ossify identity and seek fixed, finite and absolute truths (Ingersoll, 2016). In her vision, a seascape epistemology "is about knowing through movements of the body situated within places—movements that have the potential to (re)create the places we inhabit" (Ingersoll, 2016, p. 38). In the imagery of currents, we envision knowing and reality *as* movement. Such imagery allows us to see our knowing selves as beings embedded and embraced by other beings, pulled by deeper undercurrents even as we are buoyed at the surface. This is clearly a different ontology of knowing. To live in such a dynamic environment one must be receptive, patient, accepting, and deferential. These virtues support our understanding that knowing and living-well are intimately interconnected.

The Fourth Pillar: Knowledge Cannot Be Divorced from Correct Practice

Rubellite Johnson has said, "Responsibility in training rests on the teacher. The receptivity to learn rests on the learner. This is why Hawaiians don't teach people who aren't interested. Information, values and morality come into play here" (cited by Meyer, 2005, p. 181). In the *hālau* we were taught that hula is more than learning step vocabulary, gestures and even dances, more than performing. While simply wanting to learn dances may be an instigating desire to come to hula, for study over time such an attitude is wholly insufficient. I found it strange at first when I was told that I needed to view myself as representing the *hālau*, not just in performance but beyond *hālau* activities as well. Western philosophy—perhaps uniquely—has long invested in the distinction between moral and intellectual virtues, assigning different values to distinguishable, even utterly disconnected disciplines of knowledge and experience. This was my default understanding. But for Hawaiians no such distinction is conceivable. Because knowledge was viewed as effective, it was seen as powerful. Thus a moral component comes into play (Charlot, 1983, 1997, 2005). The power of knowledge explains, in part, why its transmission was guarded by *kapu* (restrictions, taboo), ceremony and prayer, and why students were carefully chosen, not just for aptitude but attitude as well. We were taught that we had a *kuleana* (responsibility) to *mālama* (care for) what we had been taught. While our *kumu* struggled to live the *kuleana* they felt, to convey hula to us in its fullest context and to *mālama* the practices of teaching and performance they had experienced, we as *haumana* continue to struggle with its fullest implications.

Receptivity, understanding and motivation all play a critical role in this context. Zagzebski has argued, "[t]he primary motivation underlying the intellectual virtues is the motivation for knowledge." To be so motivated "leads a person to follow rules or procedures of belief formation that are known to her epistemic community to be truth conducive" (Zagzebski, 1996, p. 181). *Hālau hula* is such a community. It moves us toward understanding that our practice must be *pono,* and what that means in terms of how we interact with one another, how we present ourselves in public as dancers and as individuals, and most importantly how we take care of what we have been

taught. From *loea*—those rare and noted experts whose critical appraisal functions to place boundaries around acceptable practice and interpretation, to offer encouragement and validation—to *haumana*, all are expected to maintain hula values and traditions. Knowledge comes with responsibility. These responsibilities are part of the body of knowledge that is our hula education. At this juncture moral and intellectual values meet.

Meyer (2003) notes that the mentors she consulted in her research frequently "brought up the notion of *pono* (righteous) behavior with regard to knowledge," linking virtues "such as humility, balance, harmony, respect, patience, kindness, hospitality and caring" with "intelligence, responsibility and knowledge" (p. 153). *Pono* is an overarching value concept in the Hawaiian language. It means what is good or excellent, what is right in a moral sense, what is correct, just and fair. It is also a qualifier of many intellectual virtues (*hakilo pono*-to observe closely, *ʻike pono*-acute observation; *lohe pono*-listen carefully, be attentive; *noʻonoʻo pono*-to think carefully, to concentrate). It indicates that the thing qualified is done in the right way, for the right reasons. These virtues derive their value from the epistemic goal and their worth lies in the motivation and the character of the seeker. Motivation addresses intention, what moves us from inside. It is not enough to have correct knowledge of choreography, of even the *mele*, the *paʻi* (rhythmic accompaniment), and other aspects of performance. It is a matter also of having correct feeling and understanding.

> …[A]ll activities and aspects of culture—are supposed to come *mai nei loko* 'from the inside,' that is, to be interiorized or connected to genuine emotions. . . . [I]ndeed, one does not really know something unless one has the appropriate feeling for it, whether respect, fear, awe, or love (Charlot, 2005, p. 109).

Moving from the inside, from *naʻauao*, takes us beyond *ʻike kumu*. Gradually we move toward understanding that, if sustained, can lead to intelligence, *akamai*, which in turn promotes further learning, and perhaps a perspective recognizable as wisdom.

Conclusion: Where I Cannot Go

When asking permission to enter the space of the *hālau*, hula dancers chant, "*Mai paʻa i ka leo!/He ole kahea mai, e!*" (Give voice and make answer/Dead silence—no voice in reply) (Emerson, 1965, p. 40). To experience the silence of no reply reminds us that knowledge is not there for our taking, that our agency as knowers is not unassailable and that we cannot always be the determiners of what we will know. Taupōuri Tangarō is a hula practitioner who has experienced profoundly transformative moments through dance. In *Lele Kawa*: *Fire rituals of Pele,* he reflects on his own journey to knowledge and higher awareness by explicating chants taken from the epic story-dance tradition of Pele and Hiʻiaka, which he interprets as a "journey toward maturation"(Tangarō, 2009, p. 10). When enacting these stories dancers take on the realities that are being portrayed with the purpose to effect, to influence or mesmerize an audience of human and non-human participants. The chants he highlights reflect personal moments along the way—of self-dialogue, sensory awareness, heightened intuition and profound enlightenment (Tangarō, 2009, p. 11-

13). The ritual elements of hula performance establish a liminal space, and the imagistic elements of chant and *mele* inform and recreate experiences that open up transformative levels of awareness and understanding. At this level the phenomenon of hula performance engenders, if only for a moment, a "oneness with the living aspect of native phenomena, that is with spirits and gods and other personas as souls, . . ." (Handy & Pukui, 1972, p.117).

Here, perhaps, we find a fifth pillar, one that supports a wider range of knowledge experiences. In this cultural space there is something instinctive, ancestral. Meyer (2003) identifies it as "spiritual," and she defines spiritual as a "way of discussing the organic and cultural mediation of experience, and hence knowledge" (p. 93). It presents itself in such modes as dreams, reading signs from nature, sudden inspirations, insights that offer deeply profound knowledge experiences, in *ʻike pāpālua* (twice seeing), and intuitions that may be ineffable or otherwise not readily expressible in direct, discursive terms. We can label such knowledge experiences as "mystical," but I see that label as a way of dismissing them, casting them beyond the boundaries of legitimate epistemological inquiry. Yet such experiences are included within a uniquely cultural space that is Hawaiian epistemology. This theoretic space enlarges the conceptual boundaries of knowledge experiences to include those sensitive to details within an environment seen and unseen, tied to one's relationship to the land and sea, to ancestral knowledge, and to collective experience. Such experiences are integral to understanding the fullness of Hawaiian epistemology. But this is not a space available to me, and so I stand at a point beyond which I am unable to speak.

Ka hohonu i hiki ʻole ke ana ʻia, aka, ua ʻike ʻia no kahi mau papa.
(The depth is unfathomable, but several strata have indeed been seen.)

*This effort is dedicated to Kumu Hula Cecilia Kawaiokawaʻawaʻa Akim.

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Indigenous Islander's Wisdom

William Jeffery
University of Guam

Yapese surveying and discussing the use of a Traditional Indigenous stone-wall fish weir located in Yap. Photograph by Bill Jeffery, 2008.

What does Pacific Island/Oceanic wisdom mean to you?

I think Pacific Island / Oceanic wisdom is a bit of a misnomer. Islands cannot seem to have wisdom, but Islanders can, and I think it should be more defined as, Indigenous Islanders' wisdom. This is the origin of island wisdom and they should be recognized. It means to me how indigenous islanders learnt over time to live in harmony with the environment and their socio-cultural and political world. They created many different customs, cultural practices, rituals, sacred and spiritual associations to help facilitate this harmony.

How/why do you bring island wisdom into your scholarship?

I try to bring indigenous islander wisdom into my scholarship through investigating and researching traditional indigenous material culture and living heritage, comparing certain 'themes' such as fishing across Oceania, and more broadly across Asia-Pacific. I have also used for example

foreign material cultural and how a lack of multi-vocality pervades interpreting and using archaeological sites located throughout Oceania, and how traditional islanders might value this material. I emphasize and reinforce in my teaching for students to question hegemonies about how heritage is perceived, how it should be researched and preserved from a number of perspectives.

Correlative Thinking in Pacific Island (Micronesian) Cultural Philosophies

James D. Sellmann
University of Guam

Abstract

To continue the project of explicating Pacific values and worldviews, this paper focuses on correlative thinking in some of the cultural philosophies of the Pacific islands, especially Micronesia. Correlative thinking differs, in degree, from scientific and academic logic that emphasize the truth-value of statements. After examining aspects of correlative thinking in Bali and the Philippines, I extract some characteristics of Pacific philosophies from cultural practices, myths, and beliefs. Unlike William Alkire (Alkire, 1972), I find that Pacific islanders use correlative thinking, not dualism, to fill their canoes and baskets of wisdom, so that they can navigate between contemporary logic or scientific thinking, and their cultural knowledge systems and ways of reasoning.

Key words: correlative thinking, philosophy, Pacific and Micronesian cultures; ways of reasoning.

Introduction

Is there a universal form of human cognition? If there is a universal form of reasoning, is it based on correlative nondual thinking, monism, or dualism? Or are there significant cultural differences in the way people think, reason, and describe the world? If there are differences in reasoning, then are they differences in kind or degree? More specifically, do indigenous reasoning approaches differ from academic or scientific reasoning? If they do, then in what ways do they differ? These questions are crucial for understanding human nature, culture, and the crux of the issues concerning cultural essentialism, cultural incommensurability, and cultural assimilation.

By further developing some of my earlier work, I explicate some of the ways that nondual correlative thinking appears in the Pacific, especially in respective Micronesian cultural philosophies (Sellmann, 2006, pp. 30-37)—see Appendix I for a map of Micronesia. I extract the correlative worldview of indigenous Pacific islanders from various cultural practices, rituals, beliefs, and mythology—see Appendix II for a graphic depiction of the Sky-World in Chuukese Cosmology. In particular the paper studies islander visions concerning the afterlife, the sky-world, cosmology, navigation, social-political order, cultural persistence and assimilation. Pacific philosophies can help maintain people's awareness of correlative thinking in the face of scientific and electronic technological practices. Correlative thinking allows anyone access to the canoes and baskets of islander wisdom, allowing us to better navigate our ways between and among scientific reasoning, and various Pacific ways of reasoning. As the wave of computer science and artificial intelligence continue to break on the reef line, correlative think offers an enticing method of reasoning.

Pacific, Micronesian, islander worldviews differ, in degree, although not in kind, from modern logic; scientific; and also, religious perspectives. They offer provocative alternative ways of thinking about the world and our place in it—see Appendix III: Conceptual Outline of Correlative Nondual, Dual, and Monist Philosophies. As will be shown below, cultural misunderstanding is often due to people's inability to navigate between correlative nondual worldviews and ways of knowing, versus modern logic and scientific thinking. Logic, as a branch of Philosophy, studies the processes of reasoning; that is, the means by which evidence is used to make claims or draw conclusions. Academic logicians emphasize that statements are either true or false. A statement's truth-value is founded on three principles of logical reasoning, namely: identity (true is true), the excluded middle (true or false), and noncontradiction (not, both true and false). In academic and scientific thinking, the contextual situation and the subjects' experiences are important only to the extent that they impact, influence, and effect how a person determines the truth-value of the premises and conclusion of an argument. The enigma of the external world is never fully decoded by linguistic expressions. In Pacific correlative thinking, knowledge based on statements is only a minor part of a complex truth-reality perspective that must be manifested in the way the knower exhibits and lives, the aesthetic, moral, and intellectual virtues in everyday life. The community of knowers maintain the knowledge base in the cultural practices and beliefs, such as their rituals and moral practices of prohibition, beliefs regarding the interplay between cosmic-order and social-order, and their ontological worldview impacting beliefs in the sky-world, afterlife, spirit-body relation, how their cosmology influences navigation, and so on.

Correlative Thinking

By "correlative" I mean *consisting of two parts, traits, or aspects that are interdependent, inseparable in thought, or always mixed-together in relationship to each other in the world like light and shadow. The correlated concepts may be thought of as bipolar extremes, positive and negative, like a magnet's poles, as binary interrelated pairs of opposites, or even negative correlations*. In correlative thinking, binary pairs of opposites, such as day/night, male/female, sky/ocean, life/death, lucky/unlucky, pure/impure, good/bad, right/wrong, guilty/innocent, spirit/human, superior/inferior, east/west, left/right, up/down, head/feet, and so on are mediated by a balancing principle as an organizing function. The balancing principle provides a center or centralizing middle area that allows the binary opposites to correlate with each other, thus interconnecting corelative pairs. The terms of each pair revert into and through each other such that, for example, humans become spirits; spirits become humans; life turns to death, and death returns to life just as day-and-night, east-and-west, good-and-bad intertwine and revert into each other. The correlative pairs are both-this-and-that; both-alive-and-dead; both-spirit-and-human; both-east-and-west, and so on.

Correlative thinking offers an alternative to monist and dualist metaphysics. Metaphysics is a branch of philosophy that studies the nature of reality. Ontology is a

subfield of metaphysics, studying the nature of existence. Monism refers to metaphysical theories that propose reality is One—one form of existence, one substance, or one process. Monistic materialists, for example, argue that only physical substances or processes exist. Modern science is a type of monism because it proposes that only energy-matter exists, which is depicted in the famous formula $E = MC^2$. Some forms of Hinduism represent monism by proposing that the true nature of reality is the God-soul (*Brahaman-atman*), while everything else is mere illusion (*maya*). In contrast, dualists argue that reality is composed of two distinctly fundamental processes or substances. Many dualists argue that one part of reality is material and the other is immaterial or spiritual. The philosophies of Plato, Descartes and Samkhya are examples of dualism. Dualism has ancient roots that continue to impact certain theologians and philosophers. Dualists, especially Plato and Descartes, and in the religious theologies of Manicheanism, Christianity, Judaism, and Islam, separate reality into two opposite, opposing and mutually exclusive forces: for example, good versus evil; heaven versus hell, or heaven versus earth; God versus humans; body versus soul; true versus false; right versus wrong; guilty versus innocent and so on. The standard interpretations of the monotheistic religions are dualisms in which the immaterial spiritual realm of God, soul and heaven stand apart from the material physical world of nature and the body. Because people do not experience this kind of a divided world, dualism has had the problem of explaining how reality fits back together after it has been split into two parts; how the two worlds connect; how the spiritual soul interacts with the material body; how the soul leaves the body and lives in another world (heaven or paradise) in an afterlife; how good and evil divide; why good people perform evil or sinful acts; how or why the good God allows evil to occur (the problem of theodicy), and so on.

Both monism and dualism are based on the principle of the excluded middle, that is, "either/or" thinking. Correlative thinking embraces a "both-and" approach. In correlative thinking reality and reasoning are interrelated, but not simply as one unity, nor merely as two separate processes or substances. Correlative thinking, as a type of nondualism, proposes that such dichotomies as unity/difference, monism/dualism are interconnected, that the nature of reality is not adequately describe by monism or dualism because reality is not One, not Two, not one or the other. Rather reality is complex and dynamic; it is experienced as exhibiting the inclusivity of a "both-and-other-aspects" or an inclusive middle, not an exclusive one—see Appendix III. In correlative thinking, it is possible that the processes of reality can be interpreted, at the same time, as a unity (monism), as two separate forces (dualism) and as something else. In correlative thinking, it is also possible that the description of reality is neither a monism nor a dualism but a dynamic diversity of both of those theories and many other perspectives.

The ancient Pacific islanders' worldviews do not fit a definition of monism or dualism. As argued above and below, they are best described as correlative nondualism. In the Pacific worldview opposites interact, interconnect, and interpenetrate into and through each other. The root of the correlative worldviews of the Pacific islanders (of Micronesia) is grounded in human embodied cognition.

Historically they originated in the cultures of South, Southeast, and East Asia when ancient mariners navigated into the Pacific.

The Pacific island, Micronesian, cultural philosophies are forms of environmental philosophy rooted in natural processes grounded in naïve realism. In this context naïve realism means that people accept the world as they experience it. Pacific cultural ways of thinking are intimately tied to the ongoing radical change and transformation of the ocean (Ingersoll, 2016). In the processes of transformation, the identity of things can change; gods become human, and humans become powerful ancestor spirits and even gods such as the demigod Māui in Polynesia, or Marespa in Ulithi. Values and knowledge are in flux as well. In a world of ongoing transmutations, rarely are linguistic expressions exclusively "this or that," "true or false." In these cultural philosophies, language, logic, and ontology are interwoven. Unlike modern linguistics, which proposes that statements are only symbolic representations, in the Pacific context words are understood to be "… really connected to their referents rather than merely arbitrary" symbols (Charlot, 1999a, p. 51). For correlative thinking the truth-value of statements is itself fluid. With correlative thinking, the three principles of logic noted above have limited application with respect to statements about reality. Shay Welch claims that "[t]he [Indigenous] Native American system of logic is non-dualistic and therefore does not contain nor need the law of non-contradiction" (Welch, 2019, p. 94 note 30). Truth is not simply a matter of a statement being true at one time and no longer true later, nor is it a matter of probability that a statement may be true with a degree of possible certainty. Simply said, truth does not rely on the accepted truth-value of a statement at all. Rather the focus is on the inter-subjective cognition of the members of the community considered in relation to the way they live in a dynamic environment. In this sense, a statement's truth-value always includes both its truth and its falsity, allowing for contradictions to be inevitable and understandable. Islanders embrace an inclusive middle reflected in the transformative processes in which statements are true-and-false simultaneously. In such a context, ultimately silence is best. The focus is on the value of the existential experience of the community in a changing environment more than the mere truth-value of statements.

Is there a universal form of human cognition? Some academic philosophers, especially Postmodernists, embrace relativism. However, there is a growing body of scientific neurobiological evidence that all human brains have a correlative structure. The sensory-motor experience and human languages operate on a two-part correlative relationship. The scientific evidence helps explain the universal use of correlative thinking in human cognition. Some of that scientific evidence is briefly reviewed to show that there is a universal basis to all human cognition—see Appendix IV: The Correlative Character of Human Cognition.

Before launching into the greater Pacific, I review some of the historical and cultural trends of correlative thinking in Indonesia and the Philippines that were brought into the greater Pacific Ocean.

Indonesian and Filipino Correlative Thinking

The correlative form of human cognition impacts various forms of thought, cultural practices, and worldviews. Because the peoples of the Pacific came out of the islands of East and Southeast Asia, allow me to briefly set the context for Pacific correlative thinking in Bali, Indonesia, and the Philippines. While undoubtedly some of the myths and worldviews in Indonesia and the Philippines are due to historical and cultural influences from India and China, I propose that there was a tendency to think in terms of correlative, nondual, interrelated opposites throughout East and Southeast Asia before the development of the formal philosophies of Hindu Advaita (nondual) Vedanta, Advaita Buddhism, and Chinese Yin-yang philosophy. Fred B. Eiseman (1990) begins his book, *Bali sekala and niskala,* by pointing out the nondual correlative orientation of Balinese Hinduism.

> In the West one is accustomed to a world built upon opposites: sacred and profane, positive and negative, constructive and destructive, male and female. The Balinese also recognize this polarity, which they call *rwa bineda*. But in the Judeo-Christian tradition, these opposites are presented as mutually exclusive choices: either one does/is good, or one does/is evil. In the Hindu-Balinese scheme, this division is neither so stark, nor all exclusive. And it includes what can be considered a third position, "center," which balances the other two (Eiseman, 1990, p. 2).

The contrast he depicts is clear, although it would be even clearer if he employed a correlative vocabulary by noting that "this polarity" represents an interconnected binary of positive and negative poles on a continuum. The contrast is between dualism and correlative nondualism. He also seems to fall into a trap of cultural essentialism and incommensurability in his own dualist contrast of the Judeo-Christian versus Hindu-Balinese worldviews. As shown below, the concept of a balancing center, noted by Eiseman, plays an important role in nondual correlative reasoning in Pacific philosophies. Charlot notes the importance of balance in Hawaiian-Polynesian thinking (Charlot, 1999a, p. 51).

Filipino creation myths share some elements of the South Asian, Indian, Vedic creation myths and also the Hindu Churning of the Ocean of Milk story popular throughout Southeast Asia. One version of a Filipino creation myth describes the ongoing battle between the male sky god, Bathala, and the female sea goddess, Aman Sinaya. One day Aman Sinaya whips up a tremendous wind and wave storm to batter the sky. Bathala retaliates with thunderbolts, throwing down boulders from mountaintops that become the Philippine archipelago. The god of the northeast wind, Amihan, becomes frustrated with and tired of the ongoing battle, so he transforms into a bird, flying back and forth between them, bringing them closer and closer together. In this story Amihan acts as a balancing, mediating principle. Finally, when the sky and sea meet, they become friends and stop the battle. Bathala plants a seed in the ocean and a huge bamboo grows. As a bird Amihan pecks open the bamboo, and a man and

woman emerge who populate the earth. The children are disobedient, and when the primal parents are about to spank them with a wooden spoon, the children disperse and their offspring generate the various castes and classes of people such as village leaders, commoners, hunters, fishermen, and so on. Other versions of Philippine creation myths begin with the separation of a cosmic egg composed of a male sky and a female ocean interacting to generate the forms and forces of the universe, and social order. In these myths we see the correlative dichotomies, above/below, sky/earth, male/female, as energy-forces in dynamic opposition being mediated by a centralizing, third, inclusive, balancing force that results in the multitude of existence, the procreation of humanity, and social stratification. The correlative cosmology justifies the social-order; the sky is to the earth as male is to female as the chief is to the subjects. These ancient stories depict correlative thinking with the transformation of identity, a balancing inclusive middle and the acceptance and reconciliation of contradictions.

Leonardo N. Mercado, in his groundbreaking study of Filipino philosophy, proposes that: "Whereas the Western mind is dualistic, the Oriental mind is non-dualistic" (Mercado, 1976, p. 122). Mercado is straddling the fence of cultural essentialism, and the possibility of cultural incommensurability that could lead to an allegation of cultural untranslatability. However, he has discovered an important trait of Filipino nondual correlative philosophy and culture. When the peoples of South, Southeast, and East Asia ventured into the Pacific, they carried their embodied folk psychology and cultural nondual correlative philosophies with them. The correlative thinking filled the canoes of the ancient mariners as they sailed into and settled down in the expansive Pacific Ocean.

Pacific Island Philosophy

Because the geographic labels Polynesia, Melanesia, and Micronesia are problematic, I prefer to refer to the Pacific islands. The Pacific encompasses one-third of the Earth's surface. It is a large and complex cultural area. I only tentatively use the dated label "Micronesia" to refer to the island cultures and peoples located in the central to Western Pacific Ocean between 2° 30′ S to 20° N latitude, and 133° 30′ E to 176° 54′ E longitude—see Appendix I: A Map of Micronesia). We should take care not to mistakenly think that there is only one uniform culture across the diverse islands just because there is a general geographical label. The islands were settled by different navigation-cultures, at different times, by peoples who spoke different dialects or different languages altogether. The linguistic evidence supports this diversity of cultural migration into Micronesia (Linnekin and Power, 1990, pp. 1-16). "No fewer than ten distinct languages were spoken within Micronesia by the time of Magellan's arrival" (Hazel, 1983, p. 3). Generally speaking, Micronesia is a nexus where at least three geographical-cultural areas overlap. From the southwest to the northwest, the Palau-Yap-Mariana islands form one area which has important material and spiritual exchanges with, the east to west, Caroline atolls and the Chuuk-Pohnpei-Kosrae islands that also share important cultural interrelations with the, southeast to northeast, Gilbert-Marshall cultural areas (Osborne, 1961).

To explicate some of the aspects of correlative thinking in the Pacific, I focus on interpretations and characteristics of the afterlife, cultural persistence while undergoing cultural assimilation, the interrelationship between Pacific cosmology and social order, and the critical balancing-directional role that the concept of the center plays in navigation.

The Afterlife

A people's vision of the afterlife provides a portal to enter their metaphysical views regarding the spirit and body. In the Pacific worldview, life and death are intimately interconnected, and humans may become powerful ancestor spirits or even undergo deification and become gods or demigods (Lessa, 1979, pp. 189-90). Moreover, the dearly departed persist in other ways, such as in the blood, in the cultural ways of thinking of their descendants, and in the way that the ancestors altered the society and environment. The ancestors laid down the rules of social-order, and the are attributed with shaping the world. The embodied experience of being a thinking creature, as opposed to a mere object, that is derived from human cognition and the folk psychology theory of mind (TOM), creates the hope and expectation that consciousness can and will survive the death of the body-of-flesh, continuing in a body-of-spirit (*soma pneumatikon*). In dualistic fashion, some educated modern people, if they believe in an afterlife at all, follow monotheistic theology, expecting the afterlife to be transcendent, in a different (heavenly) realm. The correlative worldview explains why for traditional islanders, that is, before the missionary-encounter, the deceased ancestors were, and in some places still are, considered to survive as members of the living community. The spirits of the dead do not leave this world for another transcendent world beyond this one. This is the case for the ancient CHamorus who kept the skulls of the ancestors in their homes and made offerings to them at certain auspicious occasions, such as traveling, fishing, harvesting and so on. They also carried their skulls into battle for added protection and guidance (Sellmann, 2016, p. 127, citing Garcia, 2004, pp. 240 and 242-43). Other island cultures believe that the dearly departed inhabit underworld realms, haunt specific places where they died, or they live in the clouds or stars in the sky-world (*kachaw*). They are never far away and can be summoned. They possess mediums. They are revered for assisting the community, or they are feared for possible retribution either because they were not treated properly while alive, or they may punish those who break clan taboos or misbehave in other ways.

Generally speaking, the ancestor spirits are temporal-spatial beings. They are believed to have a type of spiritual body that can employ special powers, and they can shapeshift. They may change, even grow, or mature over time, and they dwell in specific places on the island such as at the place where their flesh-and-bones died, on the reef, in a shrine, or in the sky-world. It is also believed that they may traverse the universe and all of its seen and unseen realms. The ancestor spirits or ghosts can undergo a process of deification or apotheosis. For example, consider the case of the

apotheosis of Marespa. A baby boy, named, Marespa was born on Ulithi atoll around 1839 and died shortly after birth.

> His ghost went to live inside [the hollow of] a *töth* or taro leaf. A *tə̀lus* or spirit called Mirrou, who used to catch the souls of living people to make them die, came to Marespa. He made him his friend and Marespa did what he said. They used a net, and starting in the east, they would try to catch the souls of all the people as far west as the Philippine Islands. They did this only at the full moon (Lessa, 1976, p. 171, and Lessa, 1980, p. 103).

Another spirit, named Sathawolemethau, tells Marespa that he was born a human being, and as Marespa matures, he feels remorse, and begins to release the souls from the net without Mirrou realizing it. Later when Marespa was dwelling in Lang, the sky-world, another spirit, named Ilurang, tells him that he was born on Ulithi. They go there, and Marespa begins to possess family mediums and the mediums of other villages. So, the people build a shrine for Marespa (*fangelmarespa*). The information he shares with the possessed mediums is believed to be accurate and respect for his name spreads to other villages and eventually to neighboring atolls. Marespa's ghost is deified as an important god (Lessa, 1976 and 1980). The apotheosis of humans is a form of identity transformation. Gods also become human, so that the inclusive middle of both god and human is at work in their way of thinking.

The story of Marespa is fairly typical of the way that other Pacific stories about the ancestor spirits and the gods are told in that they dwell in specific places; they possess mediums and convey useful information. They use tools to achieve auspicious or inauspicious deeds. They operate in a seasonal or timely manner. The gods undergo transformations, grow, or shapeshift. Because Pacific philosophical interpretations do not think in an "either/or" manner, they are able to interpret the world in an inclusive, balanced, "both-and," physical-spiritual, seen-unseen dynamic world of transformation.

Chuuk beliefs elaborate correlative thinking in their views of the afterlife and the spirit. An afterlife in paradise was lived either in the sky-world, among the clouds and stars, in the vault of the great cosmic meetinghouse, or in an underworld. For the Chuukese, wrongdoers went into a place of damnation (Chuuk: *Leenchichi*, derived from "*chichi*" the name of a tree whose sap causes intense burning skin irritation), called the "Sea of Muck" in which they cannot move (Goodenough, 2002, 150). There are "currents" or passageways that connect the underworld, this world, and the sky-world. All the realms interpenetrate and co-mingle in an inclusive this-worldly correlative manner (Goodenough, 2002, pp. 85, 150, 156)—see Appendix II: The Sky World in Chuukese Cosmology. Ward Goodenough notes the importance of ancestor ghosts that obtain access to "the lore of the gods in the sky-world" (*nááng*) to become "effecting spirits" (*énúúsor*). These effecting spirits possess mediums and transmit *roong* or knowledge and spells for "… the effective performance across the entire range of arts and crafts, such as healing, weaving, house building, and canoe making" (Goodenough, 2002, p. 156). In Chuuk theology humans have two souls; one is good and the other evil (Goodenough, 2002, pp. 63-64). When family members are ill and

about to die, relatives tend to the sick with tender loving care to attempt to ensure that the relative's good soul protects the clan from the afterlife, while attempting to ensure that the evil soul does not return to haunt or make them sick. The Chuuk goddesses, gods and ancestor spirits also shapeshift (Goodenough, 2002, pp. 94-99). The spirits of Chuuk likewise dwell in specific places, possess mediums, transmit knowledge, and engage in physical activities, depicting the transformation of identity and the inclusive middle.

Ancient, ingrained visions of the afterlife persist in many cultures evidenced in the ever-popular ghost stories. As cultural encounter was stimulated by European and Asian capitalistic-imperialism, colonization imposed cultural assimilation with scientific and religious education. Indigenous correlative thinking, languages, and cultures persist in the process of assimilation.

Cultural Persistence and Assimilation

In this section I delve further in the manner in which Pacific cultural ways of correlative thinking are maintained under colonial assimilation. I use the term "ancient CHamoru" (previously spelled Chamorro) to refer to the original inhabitants (*taotao tano* people of the land or *nusantao* new homeland peoples) of the Mariana Islands; their culture was somewhat different from the modern CHamoru, who are mostly Christian and trained in science or theology. There are linguistic and genetic traits that endure from the past among the modern CHamoru. An important difference between the post-enlightenment, missionary-influenced, modern peoples' ways of thinking and the pre-encounter, ancient (traditional) ways, including the ancient CHamoru vs. the modern CHamoru worldviews, is that the modern people's tendency, at least in certain contexts such as in an academic setting, court , government office, or at church, is to split the world into dualistic opposites or collapse the opposites into an overriding monism. While the ancient, pre-encounter worldview, like most Pacific-Asian cultures, especially Indonesian, Malaysian, Filipino, Chinese, and Japanese, is constructed on a correlative nondual relationship obtaining between pairs of opposites. In other contemporary CHamoru cultural contexts, such as at home, people are more likely to employ a traditional, correlative understanding of the world (Santos-Bamba, 2020). Charlot supports this persistence of traditional thinking by noting that many indigenous cultures "… seemingly overwhelmed by larger cultures—endure" (Charlot, 1999b, p. 542). While indigenous culture and patterns of reasoning persist, people are able to negotiate with contemporary socio-economic needs. For example, in any culture students preparing for the Bar Exam will muster their best inductive and deductive logic. However, they will not be well received at many a family dinner table, if they insist that every conversation requires those forms of reasoning.

The contrast between the European and CHamoru perspectives is further illustrated in the journal of the Spaniard, Fray Juan Pobre de Zamora, who visited Rota in 1602. He relates an exchange between his Spanish friend, Sancho, and some CHamoru elders. Sancho asks the CHamorus about the world's creation, who made the heavens, the earth, and the ocean (Driver, 1989, p. 23). From a European, Roman

Catholic, perspective Sancho is expecting them to say that God, the First Cause and Prime Mover, created the world. But the CHamorus think the questions are foolish and report that they themselves make the heavens by looking at them. They make the earth by tilling the fields and the ocean by fishing and sailing on it. Sancho thinks their answers are foolish; he is expecting a causal answer. The Seventeenth Century CHamoru worldview differed from the Spaniard's dualistic worldview. In part, Sancho and the CHamoru elders misunderstand each other because neither can navigate between the nondual and dual epistemologies. The CHamorus understand that things have value and meaning when humans engage and work them, whereas Sancho understands things based on "either/or thinking about independent essences or substances. Pacific islander correlative thinking concerning the inclusivity of relationships, especially family-clan relationships, creates a personal identity derived from relatedness, rather than abstract ideological thinking.

The modern cultural and religious tendency to accept dualism places value in abstraction, in higher ordered, structured systems of belief. This has led many modern people to identify with abstract belief systems rather than localized social interactions. Many modern people's identity is rooted in a religious dogma, a political ideology, or a scientific methodology. The islanders' identity is rooted in their lineage; it is through the ancestors that people are related to the environment. The lineage establishes people's totem relation to the fish in the ocean, the land, the creatures on the island, and the stars in the sky. Hence family and clan relationships are essential. The world is living, and humans share kinship relations with natural objects, or animals—totem practices regulate behavior (Fischer, 1957). Instead of rigid, structured belief systems, the (Micronesian) islanders' world is based on a rigid, structured extended family-clan-social system. Relationships of interdependency and exchange define who and what a person is—not a person's abstract beliefs about the world, the state, or God. The this-worldly character of the Micronesian worldview is a corollary of their correlative understanding of the world. The sky-world is a continuation of this world. There are correlations between the gods and the forces of nature. There is an exchange system between humans and the gods, nature spirits, and ancestor spirits. The afterlife is a continuation of this life in many ways, which stands in contrast to most Monotheistic theology. The worldview or cosmology is tied to the moral and social-political structure. Based on correlative logic, things and people are not always what they appear to be, so one should be wary of passing judgment on them too hastily. The outcast or disfigured person may be a goddess who could shed money on you. The apparent fool may be a wise ancestor spirit; an evil criminal may save your clan. Insightful mercy should override blind justice. Pacific islander ways of organizing society are connected to and derived from their cosmologies.

Cosmology and Social Order

In this section, I discuss some of the CHamoru, Palauan, and Yapese myths and beliefs to show that their cosmology impacts their understanding of cosmic and social order. An ancient South Asian, Vedic, story, the swan-maiden tale, popular in the Pacific,

depicts a correlative thinking principle of identity transformation as do other myths from the islands.

The ancient CHamorus most likely thought that Guåhan (Guam) was the center of the world, and Fouha rock (Puntan's phallus) was their *axis mundi* (world center). Most likely, they viewed the world as a flat disk covered by the vaulted sky-world as an upside-down bowl or half of a coconut shell, that is, similar to Chuuk cosmology (Goodenough, 2002, p. 85)—See Appendix II. Indigenous Pacific islanders recognized that the islands are, in a sense alive, developing and growing either by volcanic activity on the high islands or the growth of coral on the atolls. The creative and generative forces (Chuukese: *manaman;* Polynesian: *mana*) constitute a hylozoistic world. Ancestor spirits, *anu* (CHamoru: *aniti*), carry on the creative life force. Similar to the stories from South, Southeast, East Asia, Indonesia and the Philippines, the cosmic generative and creative force splits-in-half (sky above ocean), and it generates the female-male procreative energy. In one CHamoru myth the primordial male, Puntan, and the female, Fu'una, live in a void. Puntan dies, and Fu'una "creates" the sun, moon, stars, islands, ocean and so on by dismembering Puntan's deceased body. The generative forces procreate all things and people. The cosmic male and female energies commingle and generate the sky-world above and the island-sea-world below. These are not two separate worlds; they intermingle in a correlative nondual fashion like male and female. In traditional Pacific (Micronesian) beliefs, the ultimate powers are either distant sky gods, or forces of nature. The ancestral spirit powers are localized with limited powers. They control and transmit good or bad medicine (sometimes called magic) by possessing people, or by visiting them in their sleep-dreams. In correlative nondual thinking, the various "realms" or "worlds" interact, co-mingle, align in balance, or fall out of balance.

The correlative thinking ideas that are exhibited in Palauan myths also have ancient connections to the Hindu Vedas. Hisakatsu Hijikata collected a trove of myths and legends from Palau (Belau) from 1929 to 1938. An early version of the swan-maiden tale is recorded in the Hindu *Vedas*, and it spread widely. Versions of the swan-maiden tale are found across Europe up to Ireland and across the Pacific, with the exception that for island peoples the swan or bird is depicted as a sea creature, a seal in Ireland, or a fish in the Pacific (Hijikata, 1941, p. 276). The swan-maiden tale is a classic example of a transformation of identity in which an aerial or aquatic creature transforms into a human figure. Hijikata's study displays many examples of identity transformation in the Palauan myths. Gods and goddesses in particular are shapeshifters, or they may undergo transformations. In one Palauan creation myth the goddess Chuab transforms into Latmikaik, creating humans and all of life. The goddess Obechad creates pigeons and earthenware cooking pots, travels to various villages, and eventually changes into a stone (Hijikata, 1941, p. 11). In another creation myth Chuab is born as a human baby and grows into a huge giant that the people can no longer feed, so they trick and kill her. When her body falls into the sea, it becomes the islands of Palau (Hijikata, 1941, pp. 11-12). In Palauan mythology, the soul (*reng*) can be both visible and invisible; the goddess Bilmemui is both a male war god, and a female priestess (Hijikata, 1941, p. 13). The Palauan myths and legends depict a world

of radical change and transformation where fish become birds, mere stones become treasured money (*udoud*), or an apparent skin disease on a young woman becomes *udoud* (Hijikata, 1941, pp. 86-89). The examples of identity transformation and the inclusive middle abound in Palauan cosmology.

Pacific island peoples attempt to live in harmony and balance between the interactions of the opposing forces of nature. In Polynesian-Hawaiian cosmology, Charlot (1999a) references some of "the most important [pairs of opposites] … were up/down, land/sea, male/female, and night/day" (p.52). Similar interacting opposing forces, such as the high-up-right-east-south-male, and the low-down-left-west-north-female are identified in Micronesia (Alkire, 1972). Correlative thinking is also found in Yap. Yapese cosmology, ritual and social-order are intertwined in correlative thinking concepts. Based on previous ethnographic work, Jay Dobbin (2011) notes that there were traditional ritual calendars in Yap that reconciled the natural and social opposites. Dobbin lists some of the Yapese correlative opposites:

the superior	versus	the inferior
tabgal (purity)		*ta'ay* (pollution)
kan (spirits)		*girdi* (humans)
pum'on (male)		*pin* (female)
pum'on (mature male)		*pagael* (young male)
pilong (those who speak)		*pimilangay* (those who obey)

Typically, the lower castes should serve the upper castes. In correlative fashion some of the practices are "something of a rite of reversal" where the upper castes assist the lower castes (Dobbin, 2011, pp. 160-61). Notice that the Pacific (Micronesian) model differs from the Chinese system in which the left-hand and east are associated with the male, light, and life (yang 陽), while the right-hand and west are correlated with the female, dark, setting-sun, and death (yin 陰), because the orientation is based on the emperor sitting in the north facing south, putting the east-and-rising-sun on his left. In South and Southeast Asia, as well as most of the Pacific, the male is usually associated with the right-hand or east side because the orientation is viewed from the perspective of standing in the south looking north, putting the west, the setting-sun, and death on the left.

Correlative thinking is used to describe every aspect of Pacific life from the spiritual realm of the gods, the cosmogony and cosmology of the universe, ways of knowing, social-moral ethical relationships, and social-political order. Simon S. Maluwelmeng (2002) describes the impact of correlative thinking on social order in the coral atoll of Woleai. Fish are the main source of protein and are highly valued. The head of the fish is very tasty; so, it is valued the most. The upper class, males and elders are associated with and primarily given the fish-head, while the lower class, women, and youth are given and associated with the fishtail. The tail provides the power to swim and is correlated with the lowest authority, who provide powerful and influential support for the chiefs (Maluwelmeng, 2002, p. 67). "In Woleai, this concept is known as *schimwel me pascshal iig* (head-tail concept). This concept establishes the status as

members within a clan directly based on their ancestors' order of birth" (Maluwelmeng, 2002, p. 64). Because Woleai society is matrilineal, "[t]he female members of the clan are the decision makers behind the scenes" (Maluwelmeng, 2002, p. 68). At certain ceremonies, a correlative reversal occurs where the women are given the fish-head, the portion usually reserved to the male-chief, or in some contexts, based on the "head-tail fish concept," a youth may have a higher status than some elders (Maluwelmeng, 2002, p. 63). Maluwelmeng describes the reversal in the following:

> In contrast to what has been said about the head of fish as a symbol of the highest, the head-tail concept can sometimes be reversed. In correlative thinking, a non-dual system operates or a bipolar relationship [exists]. It is the union of the two opposites that makes the system work ([citing] Sellmann, lecture notes, February 2001). The concept of the reversible fish can be illustrated through sibling relationships. Because Woleai is a matrilineal society, the power of the clan is with the female members of the clan. The paring of opposites in correlative thinking allows members to be associated with physical strength and aggressive actions and therefore men are usually the chiefs and spokesmen of the family but the power rests with the female members (Maluwelmeng, 2002, p. 67).

His interpretation of the Woleai worldview and correlative thinking is expressed in their social arrangements and rituals. The great technological advancement of the art and science of Pacific open ocean navigation is a hallmark of ancient human achievement. The position of the balancing center is critical to Pacific islander correlative thinking and their methods of navigation.

Navigation and the Center

As noted above, the balancing concept of a "center" plays a crucial role in the (Micronesian) islanders' worldview. The "center" as a directional compass point is essential to their methods of open ocean navigation. As we saw above, the interaction and interpenetration of the bipolar, correlative pairs of opposites are maintained and harmonized by balancing at the center. Pacific island (Micronesian) cosmology is organized around the focal point of a center. This is especially true of navigation techniques, where the navigator (Chuuk: *pelu*) must continually negotiate his course from the center of the star compass as his position changes (Alkire, 1972, p. 489). In their understanding of navigation, the islands are also moving, and in an inclusive middle fashion, the island finds the *pelu* by means of his navigation skills. Vicente M. Diaz notes that: "[i]n the logic of this non-Cartesian cartographic time piece of a sensual computation you will notice that, sure as the canoe makes progress accordingly, such a movement is also made possible by tracking the rate at which the three reference islands move about as if the canoe were stationary" (Diaz, 2019, pp. 5-6). Diaz (2019) continues, describing how indigenous islanders are "rooted in rootedness, deep ties to place and mobility are not only not incompatible; they are mutually constitutive and

culturally generative" (p. 6). This kind of Pacific thinking is a type of "cosmic cognition" in which things and processes are understood based on their inclusive relationships with other things and processes. Any kind of "… Cartesian exclusion of everything 'extraneous' …" was not considered possible (Charlot, 1099a, p. 52). This illustrates how the *in*clusive middle of Pacific nondual correlative logic is at work in the navigation skills and ordering of the cosmos. Charlot and Diaz criticize Cartesian reductionism and dualistic "either/or" thinking. Problematically, Cartesian dualism influenced many early anthropologists who studied the Pacific.

For example, William Alkire (1972) describes the Micronesian and Southeast Asian systems of order as "dualistic" (p. 491). Based on my research, the description of Carolinian systems of ordering presented by Alkire describe a correlative nondual worldview, not a dualism. If we replace his term "dualistic" with "nondualistic or correlative," the point of comparison between the systems of order in Southeast Asia and Micronesia becomes much sharper, and the contrast or differences in degree between nondualism, monism and dualism come to light. This is illustrated in his summary:

> . . . [T]he comparison presented of Pacific islanders and Southeast Asians indicates a genetic relationship, since the complex of traits compared most likely could not have diffused as a whole from one area to the other. The basic principles of this cosmological order are the square, units of four, the center, and if one prefers, dualistic divisions.
>
> In the Carolinian case *twos* and *fours* and multiples thereof, are basic to most ceremonial events and specialists' activities: twos in halving of measurements, right and left, and divination pairs; fours in navigation directions, square form of the compass, taboos, and divination; eights in specialized counting techniques of both navigation and coconut distribution; sixteen when referring to divination spirits; and twenty-eight and thirty-two as the basis of the navigator's celestial compass. In Southeast Asia dualistic oppositions are emphasized between right and left, major and minor etc.; fours, eights, and twelves are involved in determining political divisions, ministries, sub and assistant ministers; and twenty-four, twenty-eight, or thirty-two define districts, provinces, celestial or political divisions and important spirits. In both areas the midpoint and center play major roles in conceptual order (Alkire, 1972, p. 491).

Alkire mistakes the correlative character of Pacific ways of ordering as a dualism because he overlooked the codependent interpenetration of the dynamic pairs of opposites. That is to say, he misinterprets their inclusive, correlative attributes that are not based on dualistic separation.

In addition to the list given by Alkire, the following is a summary of examples of nondual correlative thinking in Micronesian, that is, Palauan, CHamoru, Carolinian, Chuuk, Pohnpei, Kosrae, Marshallese, and other, philosophies:

- male and female creative powers interact to generate the living-world and social order.
- the totem sibling relations between humans and the natural environment are interrelated, genetically inclusive.
- the correlative continuum between the sky-world and the ocean-island-world is inclusive.
- the correlative relationship obtaining between the compass directions—the horizon points of rising and setting stars.
- the correlative relation between inland and ocean-side orientations.
- the correlations of right/left, east/west, north/south directions, and male/female orientations.
- the interaction of life, death, and the afterlife; the exchange from spirits to humans, and humans to spirits.
- the alterations between good and bad behavior.
- the alterations between good and bad luck.
- and the diviner's perceived ability to predict the future exhibits a nondual correlative interaction between the present and the future.

Correlative thinking influences Pacific ways of reasoning and ordering the world. Its concept of the balancing center is crucial to navigation. As show above correlative think is used to interpret the cosmos, nature, ritual, social order, cultural persistence, and traditional understandings of the afterlife.

Conclusion

Correlative thinking differs in degree from modern deductive and inductive logic, science, and theology. The correlative nondual worldview is not beyond reproach. Like monism and dualism there are problems with nondualism. Criticisms can be leveled against it. Correlative thinking is not only based on neurobiological brain structures, but also it is created by human speculation and folk psychology. Folk psychology is not independently verified, and so it lacks soundness. The counter claim is that the legitimacy of correlative thinking rests on the fact that it has been verified by the ancestors as an art of living-well. Monists might criticize it for denying an underlying unity, or they may attempt to impose unity on correlative thinking by focusing only on the concept of the center. Dualists criticize correlative thinking for ameliorating the differences between opposites. Correlative thinkers reply that the monists and dualists only exhibit one-side of reality. The monists focus on the One, while the dualists focus on the alleged and equally unvalidated existence of a higher (transcendent, spiritual, or supernatural) form of the two aspects of reality. Correlative thinkers point out that all the metaphysical and epistemological systems are founded on human speculation, not verified facts. For correlative thinkers, the value and importance of the belief system is found in its ability to make life meaningful. It helps people forge a path to live with wisdom. Correlative thinking helps people navigate a centered inclusive way to live in harmony with others and the environment.

Correlative thinking has been an important aspect of embodied human cognition, and folk psychology's theory of mind. It has served humanity well for millennium as a resource for embracing the changing environment, maintaining social order, and for understanding the need to respond to contingencies. Correlative thinkers' use of an inclusive middle or central balancing focal-point provides important insights for applying mercy when blind justice becomes unnecessarily severe. Correlative thinking can help, and has helped, humans cope with inconsistencies and outright contradictions encountered in social life. Rites of reversal help maintain social order. Because knowledge based on statements is only a part of a complex truth-reality matrix, Pacific islander philosophies concentrate on the way the knower exhibits and lives the aesthetic, moral, and intellectual virtues in everyday life. To survive and thrive in the modern world, correlative thinkers must, also, be able to understand, discuss, and apply scientific and technical knowledge. Computer science is rapidly improving artificial intelligence (AI). It is questionable whether or not autonomous AI will be able to deal with inconsistent, contradictory contingencies, change, anomalies, or felicity conditions given its true versus false, or 0/1 programing. Until AI can learn to understand the need for mercy, then correlative thinking will continue to offer humans a sustaining value. If AI is going to serve humanity well, then it will have to be programed with correlative thinking skills. In today's world we must master various types of monistic and dualistic scientific thinking, electronic and computer technology. If we seek to maintain and continue to develop the traditional forms of culture, reasoning, and philosophy, if we are to navigate our way into a prosperous future, then correlative nondual philosophies must continue to fill our wisdom baskets, our canoes, lodges, and our lives.

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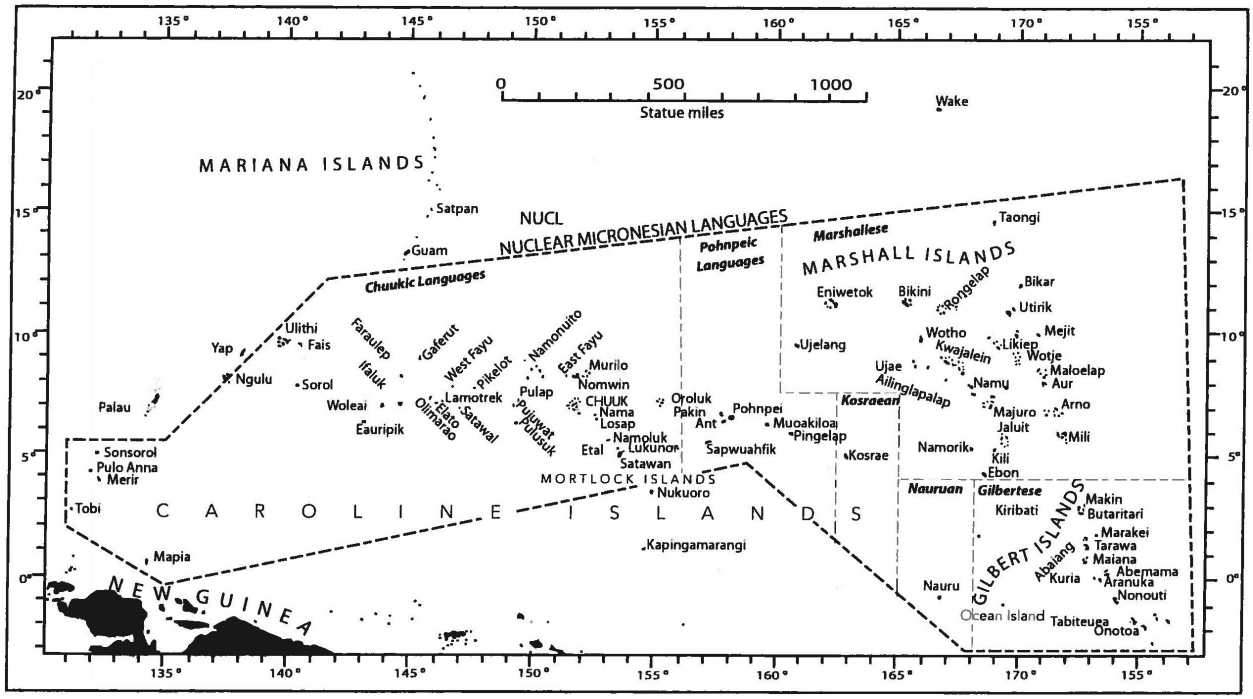
Appendix I

A Map of Micronesia



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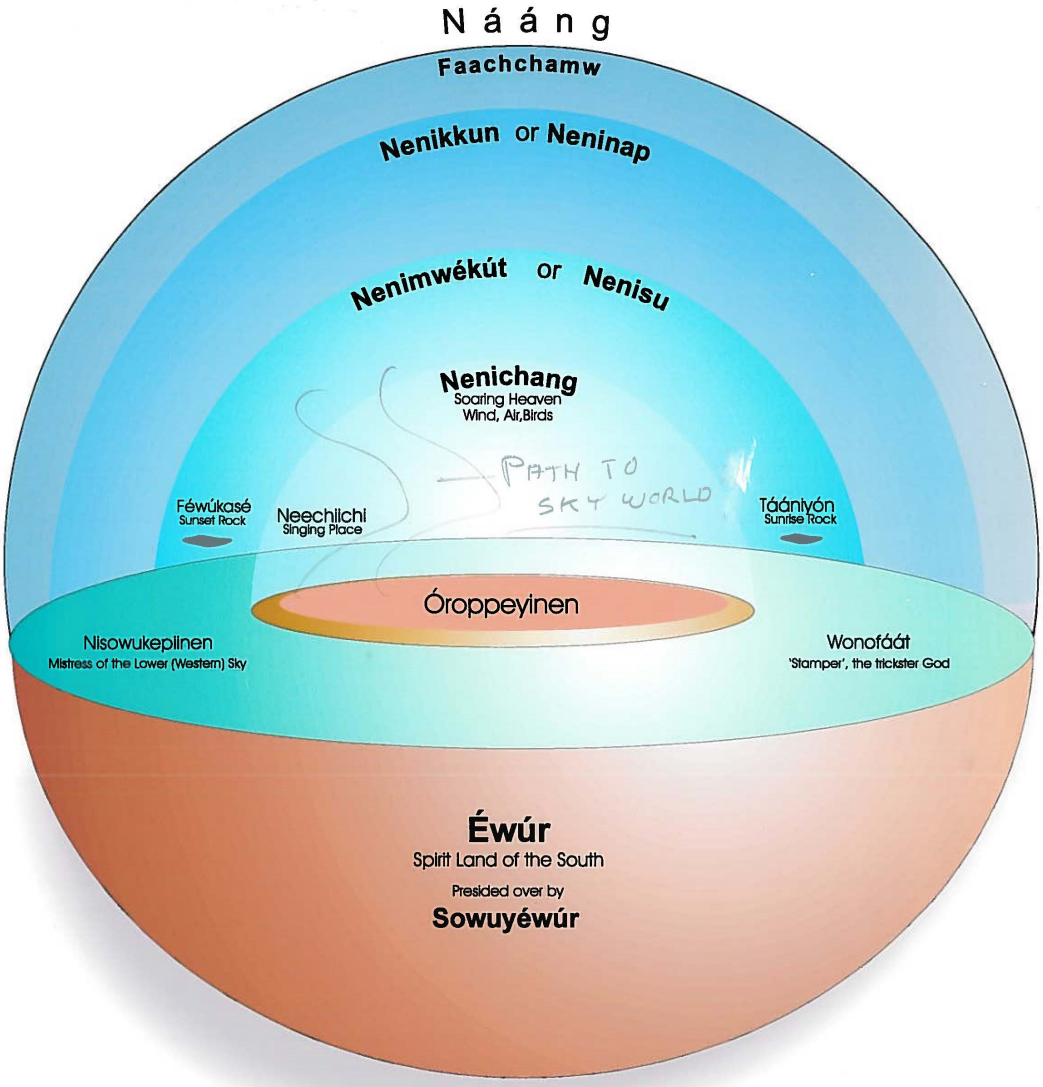
Appendix II

The Sky-World in Chuukese Cosmology



The Sky World in Chuukese Cosmology

From Ward H. Goodenough

Drawn by Phillip Nobel. (2001). For a course on Micronesian Philosophy. Mangilao. University of Guam. Based on the description in Goodenough, W. H. (1986). "Sky world and this world: The place of *kachaw* in Micronesian cosmology," *American Anthropologist,* 88:551-568.

Appendix III

Conceptual Outline of Correlative Nondual, Dual, and Monist Philosophies

Correlative Nondualism	Dualism	Monist
correlative forces	two distinct types	one type
interaction	separation	unity
interpenetration	different natures	one nature
dynamic	static or dynamic	static
process	substance	substance
syncretic	exclusive	very exclusive
multivalued	two values	one value

Appendix IV

The Correlative Character of Human Cognition

The purpose of this appendix is to show that there are neurobiological, linguistic, and sensory-motor aspects supporting the claim that correlative thinking is a universal form of human cognition. Human cognition is rooted in the neurobiological brain structures that are themselves correlative, forming the character of both pre-linguistic and linguistic correlative thinking. As noted above in this paper, "correlative thinking" means *consisting of two parts, traits, or aspects that are interdependent, inseparable in thought or always mixed-together in relationship to each other. The correlated concepts maybe thought of as bipolar extremes, like positive and negative, or as binary interrelated pairs of opposites or even negative correlations.* Angus C. Graham has

argued that correlative, so-called yin-yang, thinking was not unique to ancient China, but common to all cognition (Graham, 1986). John Charlot also argues that the correlative, binary, pairs of opposites, such as day/night, male/female, sky/ocean, "… are found worldwide" in mythology (Charlot, 1999a, p.52). More recently, Steven Farmer, *et. al*, offer evidence from their study of neurobiology, which shows that the brain's neuron structures are themselves correlative and underlie "primitive" thinking globally (Farmer, 2000, pp. 56-64).

Based on folk psychology and Farmer's findings, Edward Slingerland (2019) builds a case that all humans share innate universal forms of cognition. He praises Graham's work for noting that correlative thinking is part and parcel of all human proto-scientific thinking (Slingerland, 2019, pp. 282-283). Slingerland argues that a primary mode of human cognition is derived from folk psychology's theory of mind (TOM), namely that embodied humans are genetically and socio-biologically disposed to hold very similar ideas about themselves and the objects in the world. The most basic form of human cognition distinguishes thinking creatures with internal states of awareness from mere physical objects. Modern cultures, on the other hand, are influenced by an education in the sciences that obstructs and changes the innate socio-biological form of cognition by emphasizing sophisticated causal explanations. Currently, the innate socio-biological cognition is more commonly found in children and undereducated people (Slingerland, 2019, p. 79). An inconsistency in Slingerland's work is his argument that the folk TOM is a form of weak dualism. He claims that mind and body are distinct. At the same time, he says that correlative thinking, with its binary, interdependent pairs of opposites, is a major part of that same folk psychology (Sellmann, 2019, p. 170). If correlative thinking is indeed the way human cognition orders, conceptualizes and describes the world, then it would make better sense to draw the correlative, interrelated, co-dependent, character of the mind/body relationship into the foreground. An example, as shown below, is illustrated in Pacific islanders' descriptions of the conscious-spirit, which after leaving the body-of-flesh, lives on as a rarified-body. The ancestors' spirits continue to physically interact with the material world, and they may shape-shift, manifesting as animals, humans, or natural objects. This example shows that correlative, not dualistic, thinking is at work.

The folk TOM is based on the socio-biological and genetic character of embodied human cognition. An embodied consciousness experiences the world through the sense organs and consciousness. The correlativity of human thought is, at least in part, derived from human embodied sensation and the structures of the brain. The correlativity of sensory data-experience derives, in turn, from the correlative character of the nervous system. For example, consider the correlative character of sensation. To hear a sound, there must also be silence. The tactile sensation must be preceded and succeeded by less or no pressure. To taste, first there must be no flavor. To visually perceive an object in the foreground, there must be a background. Contrast is operative in all sensory experience. A sensory experience of an object or sound entails blocking out or limiting focus on selected experiences. On a neurological level, sensation derives from the integrated-binary operation of the neurons firing and being at rest. The nervous system operates on a type of correlative code such that the neuron

is stable, at rest, inactive. Then, there is an electrical-chemical charge. The neuron "fires," releasing neural transmitters that trigger the next neuron, and so on, until the brain is stimulated. Therefore, sensory experience and the nervous system operate in an integrated-correlative process. The correlativity of sensory experience forms the basis of pre-linguistic thought in other animals and humans and it helps form linguistic thought in especially pre-scientific or proto-scientific cognition. Linguistic thinking, especially, displays a basic correlative characteristic (Graham, 1986, p. 1-5).

Thoughts, especially linguistic concepts expressed in spoken and written language, entail correlative aspects. The correlative character of linguistic cognition is derived from the experience of embodied consciousness. Consider the correlativity of our bodily parts: the head entails the feet; one foot entails the other; one hand works with the other; one eye sees with the other; one ear hears with the other; taste and smell function together. From the correlative nature of sensory experience and our bodily parts, cognition, especially linguistic conceptual thought, is generated in correlative patterns. Consider these relationships: head : feet :: up : down :: ruler : subject :: good : bad; or hand : hand :: right : left :: east : west :: good : bad :: life : death. This model of correlative thinking is also at work in philosophical, scientific, and theoretical thinking. Scientific statistical correlations and analogies are based on correlative thinking. Graham (1986) contends that correlative thinking is at the root of analytic reasoning. He exposes the structuralist form of correlative thinking that underlies the analytic approaches of Gilbert Ryle's *Concept of Mind*, and Thomas Kuhn's *Structure of Scientific Revolutions*. He shows, for example, that Ryle's analytic dissolution of the mind/body problem is based on substituting old correlations of mind : body :: ruler : subject with new ones such as mind : hands, and other body parts :: university : colleges, and other departments. For Ryle, "mind" is not a hidden controlling substance in the body, but an organizing function. In a sense correlative thinking focuses on the organizing function of concepts by embracing a "both-and" perspective, rather than a dichotomous "either/or" view of disconnected substances. Correlative thinking, Graham argues, is at the root of both linguistic and pre-linguistic thinking, and it has ". . . nothing whatever to do with the level of sophistication of thought in general" (Graham, 1986, p. 6). He contends that until a clear line is drawn between testing a law and the creative thinking behind it, there is ". . . no prospect of rejecting correlative systems as unscientific in principle" (Graham, 1986, p. 7).

Notice that statements, or sentences are composed of two fundamental parts—the topic and the comment, or the subject and the predicate. Graham lays out "the principles of a structuralist approach." He draws upon Ferdinand de Saussure's linguistics to suggest a "perfect fit" between correlative thinking and the function of language. Employing Saussure's distinction between *langue* and *parole*, Graham analyzes at length the latter's application of paradigm/syntagm and metaphor/metonym. Although Graham starts off with what he considers to be a truism—that thinking is conducted in sentences, nevertheless, he also wants to account for a broader pre-linguistic form of thinking that roots correlative thinking deep within all animal experience. Graham contends, contra the "black box" of early behaviorism, that: "Pavlov's dog *expects* dinner as he hears the bell" (Graham, 1986, p. 21, italics added).

Another way to approach the correlative nature of thinking is to consider the importance of comparison or analogical reasoning as it occurs in everyday thinking, and in scientific or academic philosophical reasoning. In everyday thinking, a person makes sense out of new experiences, and unknown things by comparing them, by correlating them to previous experiences or known things that appear to bear some similarities. Analogical thinking also represents a "both-and" not an "either/or" point of view. Categorizing items by their functional-organizing attributes reinforces the tendency to emphasize similarities over differences (Charlot, 1999a, p. 51). This approach of using "both-and" organizing functions for making comparisons in everyday thinking is raised to formal precision with the inductive argument by analogy.

The correlative nature of human cognition, which is also found in folk psychology, is probably the wellspring from which philosophical systems, especially monism, dualism and nondualism develop. If human cognition is correlative thinking, then how is it that our innate form of thinking is different in degree from academic logical and scientific reasoning? First, note that following Slingerland, through the processes of enculturation and socialization, scientific education has obstructed or disengaged modern educated people from our innate universal form of correlative thinking. Second, what I am proposing is that it is the degree of emphasis that a community of knowers places on the truth-value of statements that marks the degrees of difference between correlative thinking, versus formal logic and scientific thinking.

Prioritizing Sustainable Living

Carl Becker
Kyoto University

What does Pacific Island/Oceanic wisdom mean to you?

1. living sustainably given limitations of land and resources (within one's means). This includes sustainable aquaculture and fishing, horticulture and recycling. Island wisdom appears in the sustainable healthy habits that make Japanese and Okinawans among the longest-lived people on earth.
2. overcoming death and disaster (such as typhoons, tsunamis, drowning). Island wisdom enables survivors to psychologically as well as physically overcome recurrent disasters and fatalities.
3. prioritizing social survival/concerns above individual preferences. To live sustainably in the face of natural dangers, islanders depend on community support and cooperation more than atomistic individual initiative (nor is escape an option).

How/why do you bring island wisdom into your scholarship?

I bring island wisdom to my teaching and scholarship on sustainable lifestyles and end-of-life care. (These are connected; most terminal patients die from unsustainable lifestyles including smoking, drinking, unbalanced diet, lack of exercise, and/or loneliness.) My English textbooks such as *Danger in Daily Life, After All: Issues of Life and Death,* and *Japan's Wisdom: How it Can Save the Future*, (all Tokyo: Eihosha) extol island wisdom and urge its emulation. My research on caregiver violence, nursing burnout, and funeral effectiveness also highlight community cooperation confronting medical and psychological challenges. The earth too is an island in space, that desperately needs to learn from Pacific Island wisdom for its survival.

Coral and Concrete: Remembering Kwajalein Atoll between Japan, America, and the Marshall Islands

Reviewed by MARY L. SPENCER

Coral and Concrete: Remembering Kwajalein Atoll; Between Japan, America, and the Marshall Islands, by Greg Dvorak. Honolulu, HI: University of Hawai'i Press, 2018. ISBN: 9780824855215, 314 pages (hardcover).

Since my first experience in the early 1980's with the Republic of the Marshall Islands (RMI), I've been stunned by the irony of the ignorance of the average American – including myself - regarding RMI relative to the actual significance of this complex portion of the Micronesian Region to US interests. Now, closing in on almost 75 years since the end of a world war that brought the US and Japan into savage combat in this constellation of hundreds of small islets and islands, RMI continues to quietly move forward, coping in its own culturally determined ways with the hideous impacts of the atomic and environmental assaults generated by the far larger, noisier powers. Today, RMI reaches its own decisions about how to cope with the challenges coming its way. Greg Dvorak, who grew up as an American kid living in the seclusion of the heavily fortified American missile range on Kwajalein Atoll in the RMI in the early 1970's, opens his childhood memories, as well as his current academic analysis, of this special and secret Pacific Island preserve of the US military. *Coral and Concrete* is worth the attention of students and scholars of Micronesia and other Pacific Islands, and for the majority of the US reading public who have not heard of Kwajalein nor even the Marshall Islands.

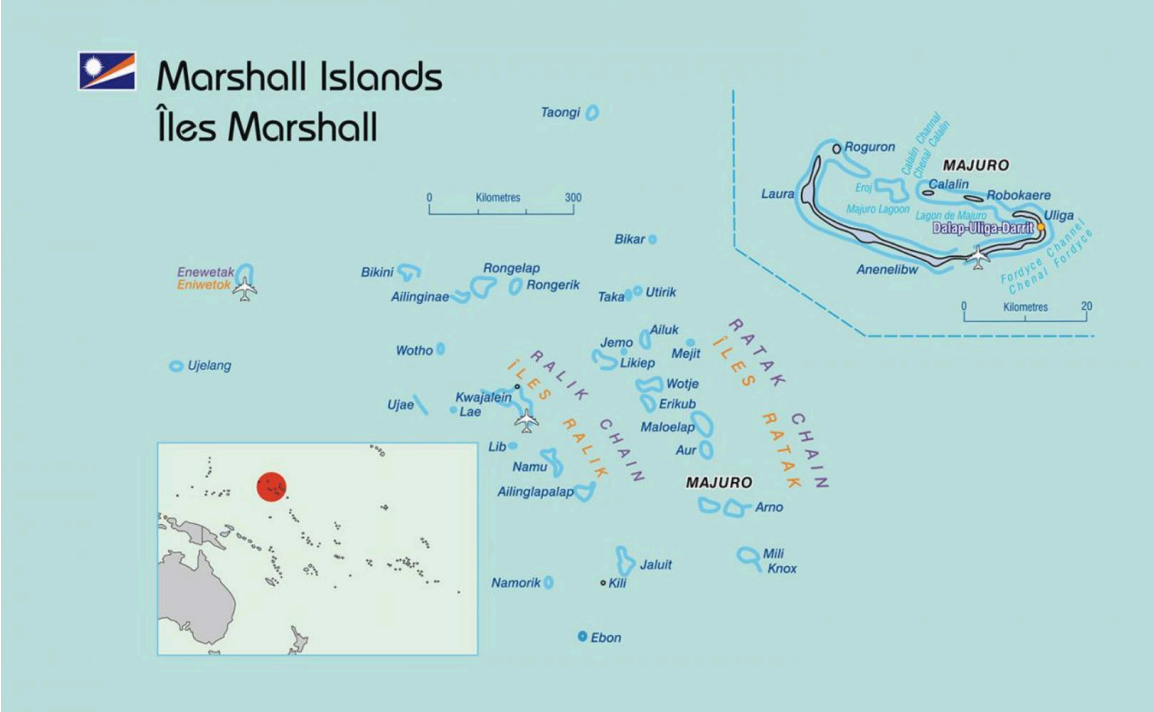


Figure 1. Map of the Republic of the Marshall Islands. *On the World Map*

For some readers, hearing the name – "Kwajalein Atoll" - brings to mind nothing more than an inconvenient landing and enforced wait within the plane on a tarmac about halfway between Kosrae and Honolulu. The non-Marshallese travelers murmur: "Why did we land here? Why can't we get off? After a few passengers are permitted to disembark and a few more board, the plane swivels and takes off again. Few on board will realize that they have just visited the "largest inhabited atoll on earth" (Dvorak, 2018, p. 1). Many aboard will also be unaware that they are leaving one of the most heavily secured US military installations in the world; officially named "US Army Garrison-Kwajalein Atoll (USAG-KA)." Dvorak describes Kwajalein's World War II history with the US, its endurance of occupation and control by Japan, and relations with the Korean laborers imported by the Japanese, as well as its continuing legacy of US military occupiers/lease-holders.

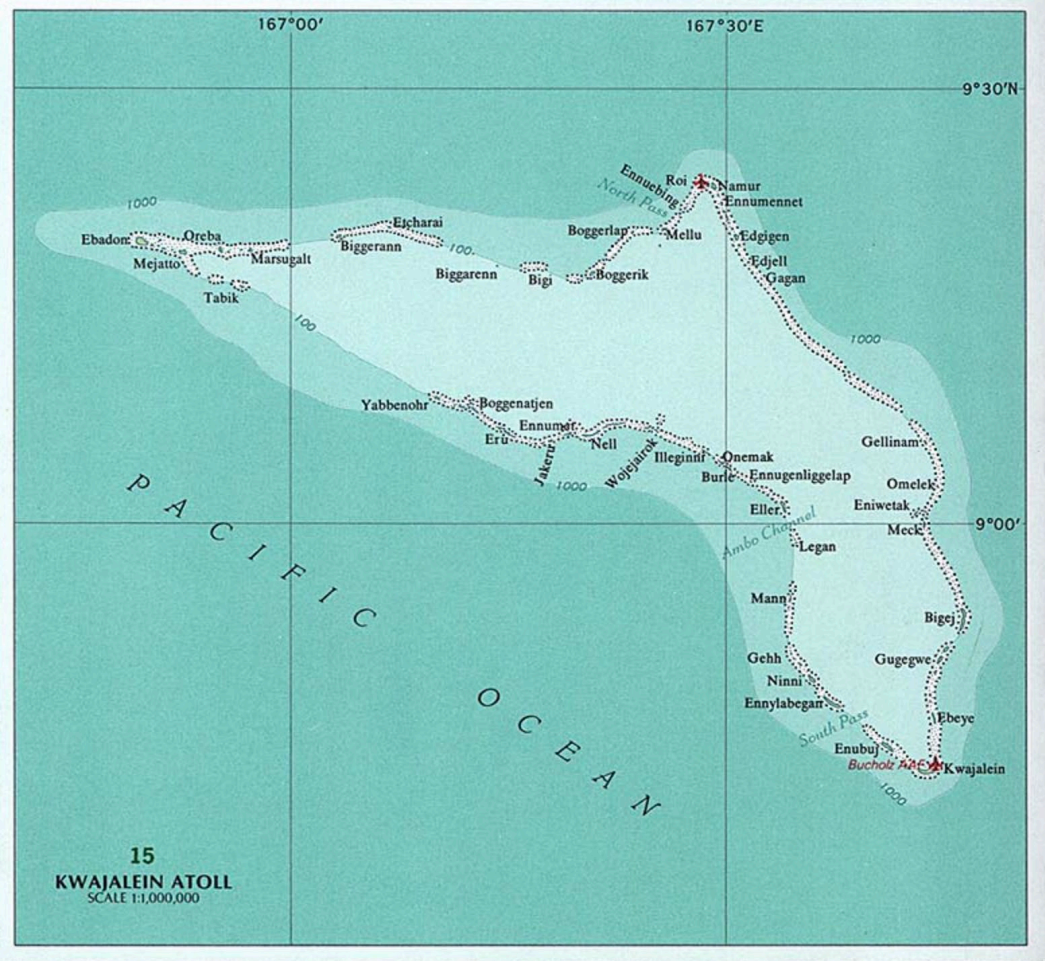


Figure 2. Map of Kwajalein Atoll. *US Department of the Interior*

For the context that would help orient readers, consider the following: The Republic of the Marshall Islands consists of 29 atolls and 5 islands with a population exceeding 58,000. It is arranged into two loosely configured vertical swaths above the equator; *Ralik* on the West and *Ratak* on the East. Kwajalein Atoll is just above center in the Ralik group, 2,449 miles from Honolulu and 1,562 miles from Guam. It consists of 97 islands, 11 of which are leased by the US until 2066, part of the Ronald Reagan Ballistic Missile Defense Test Site. One of the world's largest atolls, Kwajalein Atoll is 6.33 square miles in land area, of which Kwajalein Island on the southern tip where the airport is located, is the main setting for Dvorak's commentary. It is 1.2 square miles with a population of approximately 1,000, most of whom are Americans. To the east and approximately 45 miles north of Kwajalein is the Island of Ebeye, where more than 15,000 Marshallese live on 89 acres – recognized as one of the most densely populated places in the world. More than half of the Ebeye population is below 18 years of age. Many of the Ebeye residents originated from other parts of the Marshall Islands, but relocated in order to find work on the base. A ferry operated by the US Army, running 10 times a day-six days a week, shuttles Kwajalein base workers between Ebeye and

Kwajalein Island. The Kwajalein economy is based primarily on the 20-year $1.5 billion US aid agreement, ending in 2023.

Figure 3. Ebeye beach Mary L. Spencer, 1990)[1]

The RMI has been a self-governing independent nation since 1986 – one of the Micronesian island states with a negotiated freely associated status with the US. Readers who are not familiar with the Marshall Islands should note that despite Kwajalein's central focus in this book, it is only one small part of the country. This physical relationship comes into better focus in Dvorak's later chapters where he relates the inter-island political process surrounding negotiation of RMI's Compact of Free Association with the US. Dvorak updates this history by relating details of the inter-group planning and debates among the Kwajalein-Ebeye Marshallese communities as they strategically negotiated with US representatives for the creation and renewal of leases for 11 Kwajalein islands. Included were land, air, and sea properties - for military and research use, and the testing of intercontinental ballistic missiles. He updates and considerably extends the historical background on Kwajalein that he provided in his earlier *Pacific Asia Inquiry* article, where he described Japan's role (2011). For example, he reveals a continuous thread of involvement of indigenous Marshallese women in the historical and political stories of Kwajalein; e.g. Hilda Heine's and Kathy Jetnil Kijiner's activities (p. 245-246), and the stories of women with chiefly power who were engaged in the lease negotiations.

[1] Harley Manner digitized the negatives and prints used in this article.

Figure 4. High density characterizes housing on Ebeye, as shown in the path between homes (left). (Mary L. Spencer, 1990).

Figure 5. Ebeye children spend much time on the nearby beach. They are frequently seen collecting snails and tiny fish in depressions such as this (Mary L. Spencer, 1990).

Dvorak presents a compelling argument against the misconception that Kwajalein is too small to be important – "the middle of nowhere" (p. 1). Rather, he says, Kwajalein is "the middle of *both* now and here, not nowhere but now-here." He constructs a metaphor in which Kwajalein is likened to coral, allowing readers to reflect

on "many of the pasts that are sedimented into the present," making it possible to "voyage through the *atollscapes* of Kwajalein."

As expected of any contemporary author writing about RMI, Dvorak analyzes the colonization issues so intrinsic to Marshall Island histories. He brings depth, heterogeneity, and personal experience to his rendition, and much grounding with indigenous lives across multiple time periods of multiple Marshallese communities. His vantage point opens some of the stories of Marshallese strategy, persistence, inter-island and inter-clan competition and cooperation across this long horizon of time to which outsiders rarely have access. He addresses the "mythmaking" of the cartography of the Marshall Islands and other Pacific islands, reminding readers of the personal motives of the explorers who developed the maps; e.g., the case of Kiribati and Nauru – once construed Micronesian, but split off at the equator in the early 20th century to suit the political arrangements of Britain, the US, and Japan. Nevertheless, the Marshallese are aware of their sub-equator ties to these island nations (p. 38-39).

In Chapter 3, Dvorak takes a deep dive into the history and significance of a Japanese song he heard about from Ato Lankio, an indigenous historian of Ebeye. Lankio learned it at school on Kwajalein and heard it sung by Japanese soldiers who had come to defend the atoll from Americans. Dvorak traces the history of *Ai Shucho no Musume* (The Chieftain's Daughter) from a time when it, "…could almost have been a theme song for Japanese colonization in the Marshall Islands;" and later, to the larger colonial push into the region, "…the southern advance." The underlying notion is that colonialists would do well to seek the favor of the Chief via romantic liaisons with his daughter. The song evolved along more extreme racist and sexist lines and spread to Pohnpei and Chuuk. Versions of it live on today on the internet.[2] Dvorak places his analysis in the context of feminist commentary on the "dusky maiden" stereotype in tourist advertising and Hollywood, citing the work of Margaret Jolly (1997), Teresia Teaiwa (1999), and others.

In reviewing the racial imagery and verbalized characterizations of Marshallese women and men by the Japanese, Dvorak included representations in photography, advertising, linguistics, and public commentary. He explained how these reflect not only Japanese colonial racial stereotyping from the early 1900's, but also attitudes that stubbornly continued into the future, dwelling on skin color and erotic qualities. He introduces readers to two racial categories that he found present in colonial Japanese discussions: Chamorro[3] (*Chamoro-zoka*, lighter skin color) and Kanaka (*Kanaka-zoku*, darker skin color such as that of the Marshallese) (p. 74). He cites a Japanese educational film produced by the Japanese Navy in 1936 – *Waza Nany□* – in which individuals in the Kanaka-zoku category were represented as darker and of a lower cultural level.

[2] Harley I. Manner identified several websites where readers can hear renditions of the old song: https://www.youtube.com/watch?v=YScBsTKxIQA;
https://www.youtube.com/watch?v=OxdBMhUHBqM

[3] For further information on the debate regarding competing spellings, Chamorro versus CHamoru, readers should refer to: https://www.guampedia.com/chamorro-vs-chamoru/

After re-reading this section several times, I am still not clear on the facts regarding the presence of Chamorro people in the Marshall Islands, on Kwajalein specifically, and the use of these terms. Dvorak maintains that Chamorro is, "…a term taken completely out of context from the Mariana Islands." He explains that it is used by Japanese to mean "of mixed race" or "of lighter skin." He continues, "…Chamorros were thought to be more intelligent, sophisticated, and advanced, and they were admired for their beauty." Questions remain about how the terms originated, what attitudes and conditions surrounded the emergence and use of the Chamorro term, and whether or not it actually referred to ethnic Chamorro people. The inclusion of the views of indigenous scholars of Chamorro history would be essential to clarifying these issues.

Consideration of ethnic origin continued, focusing on the Japanese-Marshallese inter-marriages during the Japanese occupation of Kwajalein. Dvorak explained that due to the matrilineal nature of Marshallese culture, the pairing of Japanese men with Marshallese women worked out fairly well; i.e., these men were not threats to the orderly inheritance of Marshallese authority and they fulfilled the expectation that marriages not be made between closely related individuals. Moreover, such marriages enhanced the power of the Marshallese women and their children within the developing Japanese authority systems in the RMI and with Japan.

"Crushed Jewels" *(gyokusai)* was the Japanese term for the devastated post-World War II remnants of the Japanese Pacific empire, and in fact decisions to actually sacrifice parts of it. Dvorak leads the reader through the rationale of Japanese expectations for American targeting of Jaluit and Mili because they were more populated and had been more intensely fortified; and then the unexpected reality of the powerful American attacks on Kwajalein: "As American plans became apparent to Japanese commanders, the order was given for the Marshalls to be 'sacrificed' for the empire on behalf of the rest of the Fourth Fleet and ultimately the Japanese home islands." (p. 103). This intended massacre entailed the deaths of thousands of Japanese soldiers and support personnel. But it was the logical outcome of the overarching strategy of using Micronesia as a protective buffer zone for the Japanese homeland.

Woven through Dvorak's chapters are glimpses of his childhood on Kwajalein. He was taken there by his parents when his father began employment as an engineer in the US missile testing program. He shares a photo of himself with his mother in 1976 as he clambered over an old bunker (p. 93), and in one of his earlier publications he includes a family photo at about the same age with both parents (2016, p. 102). Remnants of the artifacts of the American and Japanese war on Kwajalein live on in his childhood memories. Even as a child he wondered about various vacated buildings and bomb craters, thus facilitating adult recognition of many of the landscapes that appear in the American military photos of victory on Kwajalein. He remembers being taken to annual events celebrating the US victory of Operation Flintlock (the US invasion of Kwajalein Atoll), in which a tent was set up with a photo display of the various stages of the invasion. In Chapter 4 Dvorak provides his systematic analysis of many of these war-time photographs, and in so doing he illustrates a research method that could be appropriately used to a greater extent in research throughout

Micronesia. Although also used effectively by other researchers (e.g., Higuchi, 2013), the method would be appropriate to the study of contemporary impacts of historical events in Micronesia on earlier as well as on today's younger generations. By combining the historical military photographs with other historical media, including contemporary interviews with some of the actual participants or their descendants, it was possible for Dvorak to explore questions regarding the presence of propaganda, of participant identity, environmental and cultural impacts, and other key aspects of historical events.

Dvorak notes (p. 96) that, with the benefit of knowledge of the continuing American military development on Kwajalein since WWII, Marshall Islanders may view the US role as part of an endless war: Atomic bomb tests, missile testing, mobilization for the Korean and Vietnamese wars, and the War on Terror. Citing another scholar of Marshall Islands life (Carucci, 1989), Dvorak suggests that the US atomic bomb tests at Bikini and Enewetak, and the missile testing at Kwajalein, are evidence of RMI's continuing legacy of proximity to US war.

In Chapter 5, *Capturing Liberation,* Dvorak displays and interprets many of the archival WWII War Images at the point of the American victory. Readers see images and their military interpretations during the early days and months following the US invasion, and read of island-wide celebration. Dvorak goes further to try to interpret the other side of this coin: The collapse of, "…thousands of years of 'free' Marshallese civilization into the brief span of American history, rendering that earlier memory obsolete. Thus, this fanfare marks the beginning of an era of American quasi-colonialism in the Marshall Islands and throughout Micronesia, in what policymakers aptly titled 'strategic trust' " (p. 154). Dvorak continues by reminding us that even now Marshall Islanders demonstrate their connection with the United States by joining the US military and being part of US forces fighting in actions such as the Iraq War. This is certainly not the first instance in world history when one country's posture with another has flip-flopped (e.g., consider the US WWII relationship with Russia versus their post-WWII positions). But Dvorak's point is well taken that: "…we are not asked to remember the mass graves where Japanese, Korean, and Okinawan bodies were buried by the thousands, not implored to know where the houses of Marshallese chiefs once stood, and not reminded that this is Marshallese land. When the US Army digs new trenches to repair its water pipes or replace a street lamp, the public rarely learns about all the bones they find." (p. 156).

In his final three chapters, Dvorak paces readers through the excruciating history of "displacement, replacement, upheaval, and change" visited upon the Marshall Islanders of Kwajalein by Japan and the United States (p. 167). These experiences include people losing their lands without compensation, having their families separated, having the fabric of their lives torn asunder; and perhaps worst of all, being exposed to radiation. This is a critical history for students of Pacific Island history and culture to know and use as they examine other ages and dimensions of indigenous Pacific Islander life. I wondered if the author was speaking tongue-in-cheek when he then mentioned that the American bomb tests, "…gave geologists the opportunity to test Charles Darwin's theories about atoll formation." Dvorak explains that up to that

time, the scientific community had never been entirely convinced; however, when the bombing exposed basaltic volcanic material below the coral, Darwin's explanation gained more credibility. Should the reader feel that at least one good thing came out of the devastating bombing?

Dvorak follows with examples of how Marshallese history is written, given that the name of each *wato* (parcel of land), carries that history (p. 180). Note his inclusion of the commentary of other noted Pacific Island scholars on this foundational point (e.g., Epeli Hau'ofa, 2000; and Carucci, 1997). Perhaps the effort of writing poetry and documenting the cultural history of a place will keep it alive in some way; i.e., in Dvorak's words: *"Writing back" the Land*.

Figure 5. The friendly children of Ebeye enjoy some spare time at this seaside store. Many of their parents travel on the boat that shuttles between Ebeye Island and Kwajalein Island each weekday to work at the base. Others are teachers, full-time parents or caretakers, while ocean activities provide vocations for many others (Mary L. Spencer, 1990).

In his penultimate chapter, Dvorak reviews the contentious tug-or-war between the Kwajalein Atoll Marshallese and the US military in the unending preparations for negotiations, actual negotiations, and renewed political struggles – within all of the various sectors of the indigenous Marshallese authority structure, as well as those of the Marshallese with the Washington and Kwajalein seated military establishment. He brings us into his experiences and observations of modern Marshallese political and cultural leaders as they plan their strategies and campaigns for public support. Readers

have the rare treat of learning of the women's resistance against US military use of their lands (e.g., p. 210-218). In the early 1980's, the RMI government negotiated a very disappointing 50-year lease of Kwajalein to the US for $4 million. Marshallese opposition took the form of an invasion – a *jodik* – staged by a crowd composed mostly of women and children engaged in a sit-in. Such actions reflect the Marshallese matrilineal social structure - *alaplap* – in which women inherit the land. Dvorak explains *lejman juri,* which he translates as: "When a woman speaks, the men must give way;" and the related cultural principle in this context – *maman maronron* - "women are the protectors of the land."

In his final chapter Dvorak overviews his and others' remembrances of Kwajalein, each forming a fragment analogous to the tiny coral polyps that, through their collective accretion, form a coral atoll. The current Republic of the Marshall Islands-US Compact of Free Association ends in 2023. In May 2020 the US Department of State and the Republic of the Marshall Islands began negotiations on agreements to amend the Compact of Free Association between RMI and the US. Recently elected President of the RMI, David Kabua (succeeding Hilda Heine, first woman President of RMI) indicated that the renegotiation is one of his top priorities (U.S. Department of State, 2020).

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The Frolic of the Beasts

Reviewed by CHRIS CABRERA

The Frolic of the Beasts, by Yukio Mishima*,* translated by Andrew Clare. Vintage International, 2018; Paperback, 166 pages; $15.00.

This year, Japan has seen a resurgence of interest in one of its greatest modern authors, Yukio Mishima, in the wake of commemorating the 50th year since his passing by ritual suicide. The writer's death was a theatrical event, staged after a failed coup at the Japan Self Defense Forces HQ where, clad in full military garb, Mishima addressed the crowd of bewildered onlookers below the balcony—military commanders and cadets, but also news crews eager for a scoop—as he demanded modern Japan return to sovereignty under the emperor in an effort to regain its former glory. The crowd, perplexed and disgusted, jeered at him, as Mishima expected. The author, who had finished the manuscript of his life work tetralogy, *The Sea of Fertility* that same morning—retreated from the balcony to enact his pact with death in an inner room. While the spectacle has been immortalized by the shocking images of this performance—still replayed and circulated to this day—it betrays an author whose life was much more complex than this event would suggest—not to mention, leaving behind a catalog of writing that stands out as some of the most brilliant works to come out of Japan—or even the world—in the 20th century. Magazines in 2020 have featured Mishima on the cover once again, introducing new readers to his library of work, and television stations have spliced together archival and rare footage of Mishima—the writer, the husband, soldier, playwright, and more—to present viewers with a montage of images of his life before his suicide shook the country and literary world 50 years ago in 1970. The television program concluded with an attempt to frame Mishima's writings in the context of the global pandemic, although these tenuous connections are certainly up for debate.

The same renewed public interest in Mishima is less widespread outside of Mishima's home country of Japan—perhaps because of his controversial politics, many readers worldwide have tread with caution—but nevertheless, there has been an increase in English language translations leading up to this commemorative event. With so many novels—not to mention plays, critiques, short stories, and the like—the task of completing Mishima's vast and varied catalog of material is daunting, but in recent years more and more talented translators have taken up the task of rounding out his remaining novels for publication, perhaps anticipating the recent sparks of interest in 2020. Stephen Dodd has translated *Life for Sale* (1968—translation, 2019) and the forthcoming *Beautiful Star,* and Mishima's look into the life of a haughty young actor in cheap action movies—perhaps a reflection of his own time in the movie industry—in the novella *Star* (1960—translation, 2019) has also appeared in translation by Sam Bett. And a year before, in 2018, another novel by Mishima appeared in English for the first time: *The Frolic of the Beasts* (1961), published by Vintage International with

a translation by Andrew Clare. Although it garnered high praise upon its publication in Japan, later on it was rarely mentioned, perhaps dwelling in the immense shadows cast by *The Golden Pavilion* that preceded it in 1955 and *A Sailor Who Fell From Grace By The Sea* in 1963. While it certainly does not dethrone these two centerpieces in Mishima's body of work, *The Frolic of the Beasts* is a reminder of some of the writer's strongest points: his keen attention to detail and vivid descriptions, his look into the increasingly complex inner workings of the mind and actions of youth, and his overall look at the masks which people hide behind and the complexities of society and the environment that serve as the backdrop.

Frolic of the Beasts was a longtime personal project of translator Andrew Clare, who shelved the completed translation for decades until he considered having it formally published—a timely decision that coincides with the aforementioned resurgence of Mishima titles that have appeared in recent years. While the number of different projects by various translators is certainly welcome news, there is some concern if these disparate publications will come together to deliver a coherent, uniform, authorial voice. Many different translators have worked on Mishima's novels and plays throughout the years –some have even worked with the author himself to have his literature presented in the best way possible to English audiences—leaving a great burden on many of these new projects to contribute to a legacy of skilled translations of Mishima's prose—and of course, between each other. A translator must deal with their work as not a stand-alone piece, but in relation to the other well-established works in the author's canon—certainly a concern for a literary figure as widely translated as Mishima, whose "voice" has already become distinct and recognizable in the English language.

Andrew Clare's translation will not disappoint avid readers of Mishima's work, who will immediately recognize this as a "Mishima" novel, with Clare's reworking of the original Japanese assuming an air very similar to one familiar to those who have read many of the author's works in English. From the opening chapter, ripe with lavish descriptions of the most mundane or deplorable workings of a prison shower to the reoccurring ventures into each character's psyche—there is no mistaking this as a novel by Mishima himself. Clare has navigated the complexities of Japanese to ensure that the *Frolic of the Beasts* keeps a natural flow that is largely uninterrupted by questionable word choice or mishaps of translation, a challenge for a translator retrieving a novel from almost 60 years ago that was written by Mishima with meticulous attention to detail.

Of course, a fine-tuned translation is nothing if its source material is bland or uninteresting and this is certainly not the case for *The Frolic of the Beasts*. The story depicts a strange love triangle between Ippei, a successful businessman and literary figure, his cold but beautiful wife Yuko, and a student apprentice, Koji, who begins working for Ippei at his luxury shop in the middle of Tokyo. Koji encounters Ippei's beautiful wife and immediately falls in love. His admiration for Yuko is perhaps fueled by his resentment for Ippei, who is openly in affairs with many other women. On the surface, Yuko is indifferent to her husband's infidelity, but this only strengthens his desire to continue. Koji agrees that something needs to be done, staging a

confrontation that catches Ippei in the act. Yet the two stop short of any real understanding, and Koji, realizing in an instant that the event is meaningless, takes matters into his own hands by striking Ippei in the face with a wrench he picked up by chance.

The bulk of the novel takes place years after this crime, after Koji is released from prison. Yuko is now living in a scenic village in the mountains of rural Japan—the fictional town of Iro located in the Izu peninsula—tending to a horticulture business, managing the green houses with an assistant, the elder Teijiro, as she tends to her husband. Ippei survived the attack but incurred damage to his physical and mental state: he is paralyzed on one side, resulting in "indeterminable smile" and can barely speak. Yuko, however, agrees to house Koji upon his release from prison—the young boy has no places to return—no relatives or parents in the city. A strange dynamic develops between the three as their pasts fester like a wound, unhealing even as time passes. Koji is still in love with Yuko, she is indeed still in love with boy, too, but cannot forsake her ill husband. Koji's brash act of violence that was enacted to set events in motion has only rearranged the complicated love triangle and brought things, once again, to a halt. In the end, Koji's life in the village with the couple ends in the way it only can—in death, tragedy, and without much resolution, suggesting they were all doomed from the start.

The events are arranged in the novel in a non-linear manner, causing enough confusion to justify a second reading. The novel opens with an episode of the three taking a photo together that comes before the tragic events at the end of the novel. Nonetheless, the narrator alludes to future tragedies that will shatter the smiles of the three reflected in this photograph. We are then directed to a hill with their graves. Although the three will be buried together, Ippei's grave and Koji's grave lie on opposite sides of Yuko's—the only one which has yet to be filled. The opening chapters rely on repeated foreshadowing of Koji's future crime, building suspense for a climactic incident that will tie the events together. Yet the suspense dissipates barely halfway into the novel, and things change gear to focus on the happenings of the three after the incident. It feels as if the novel could have benefitted from a rearranged timeline, with the opening feeling unbalanced and rushed to present the complicated back story only to approach a slower pace later.

But conforming to a standard narrative structure is admittedly not typical of Mishima. Damian Flanagan points out in his review that the disturbed sense of linear time that runs through *The Frolic of the Beasts* is predicated on its heavily reliance on tropes from Noh theater.[1] An avid fan of the traditional art, Mishima was not only heavily influenced by the plays in his writings but also a Noh playwright himself.[2] The odd and unbalanced timeline, then, is perhaps intentional; avid readers of Noh theatre may not feel that Mishima's sense of time is jarring. The seemingly out-of-place Epilogue will also make more sense to those familiar with Noh. After the events of the novel, the narrator switches to the first person, as told by a young researcher who comes to the village of Iro by chance and learns of the events of the novel through a conversation with the priest of the local temple. This intervention in the main narrative by a third party is actually itself emblematic of the structure of many Noh stories, where

traditionally a travelling monk, messenger, or other third-party character relays the events of the main narrative.[3] The Translator's Note at the end of the novel suggests the novel is itself a parody of the *plot* of a traditional Noh play, but *The Frolic of the Beasts* perhaps owes much more to the structure of this art form than meets the eye.

Of course, Clare also notes how the quintessential element of Noh, its signature masks, is particularly important in understanding the emotions and appearances of the characters in the novel. In Noh, these highly stylized and sometimes jarring masks express specific emotions and characters of the actor who wears them—some are extremely particular and complex, requiring a detailed understanding of the art. But in *The Frolic of the Beasts* Mishima is arguably more concerned with complexities of the exterior and interior of his characters, and how this inner world and outer appearance is frequently disturbed and unpredictable. The form of an interior self that is discontinuous with a public selfhood is rooted in Japanese culture; Mishima has arguably expressed this doubleness in his writing more than any other Japanese writer, and it involves masking outward appearances, attention to aesthetics beauty and peace, to hide a much darker and deeper interior strife that often makes it difficult to decode the actions of a person. This is especially true in Mishima's novels, and in *The Frolic of the Beasts* it contributes to the complicated actions of the characters, namely of Yuko. While we learn much about Koji through the narrator—and little about Ippei, in fact—Yuko herself seems difficult to fathom. Ippei's vice is that no matter how ill his deeds, his wife never seems to voice her concerns or get angry in front of him. And while the connections to Noh theater invite readings of her emotions as a kind of mask to shield her inner self, it is made even more complex by the fact that her face is truly shaded from view by her parasol. Neither Koji nor Ippei has been able to see *through* her "mask" but neither have they ever been able to clearly see the mask itself. The layers of distortion and indeed the complexities of the mask scramble any simple congruence with Noh mask readings—of which there are many for specific masks—and reminds one of Mishima's own complex I-novel *Confessions of a Mask,* wherein it becomes increasingly difficult to distinguish the narrator's confessions from Mishima's own self-revelations.

In *The Frolic of the Beasts*, however, Mishima gives readers ready access to the mind of the main character, the nihilistic youth Koji. Character psychology, as in Dostoevsky, is one of Mishima's strong points; his probing of the monk's incentives for arson in *The Temple of the Golden Pavilion* come to mind as a prime example. It is noteworthy that the nihilistic spirit of Koji's youth invites comparison to the psychological perturbations of Kiyoaki, the wealthy young protagonist in the first novel of his tetralogy, *Spring Snow*. While these characters are markedly different on the surface, Mishima awards them the same morbid complexities, the same flaws, and the same frustrating imperfections. A good example is the rash behavior of Koji, who strikes out at Ippei or holds back his feelings for Yuko at the last moment; such inwardly troubled, erratic behaviors stir reader interest if not empathy.

Overlooked in other reviews of *The Frolic of the Beasts* is Mishima's framing of nature and the rural village as a space of aesthetic beauty that hides a deeper layer of sin underneath. Mishima spends paragraphs exploring the richness of the countryside

landscapes, his narrator sometimes even losing track of himself as he relishes in passages that praise its vast sublime beauty. Rural life is idealized when Koji and his friends spend a night under the stars on an island of the coast, "content in the feeling of superiority that came from indulging themselves in a special kind of pleasure, the likes of which they knew was alien to city dwellers."[4] But far from a simple claim that the beauty of the countryside contrasts to depressing city life, Mishima instead opts to complicate the view of such a pristine location by also exposing how it can be unsettling. Koji—along with Ippei, too, as we later learn—is wary of the darkness in the village: "The graphic quality of everything that lay in slumber during the day awakening all at once was so much more physical than nights in the city…night itself was like a colossal, intense piece of meat saturated with hot blood" (116). The vast beauty of the countryside also masks an endless unknown, one that inciting fear as much as wonder. On their hike to a waterfall and small shrine in the mountains, the pristine natural landscape contrasts with the tension boiling within the characters themselves. Perhaps there is something more to the characters than a tenuous link to the environment of this place, especially when considering that the scene in which Yuko uses Koji to mock and torture Ippei begins when the sound of the waterfall arouses a change within her. Nature, too, is affective and a part of the actions of Mishima's characters. Village life away from the busy city is far from simple, with rumors spreading like wildfire and a collective mentality that ceaselessly monitors the household of Yuko. The villagers distance themselves from Koji when they hear rumors of his time in prison, although this dissipates as some of them become curiously attracted to his fresh new face.

The minor characters in the village—that Mishima spends time to detail—are also not without their depravity. The "purest" of characters, the town priest, who later corresponds with Yuko even after Koji's crimes have him sentenced to death and Yuko sent to prison, is hardly a saint. Mishima personifies him as a beast who "thirsted after people's suffering" and was "trying for a good catch." He seems like a predator when he is described as "detecting" the "delicious smell" of Koji and Yuko's anguish, perhaps anticipating that their plunge into sin will lead them to him someday (68-69). And not only does the priest of a small rural shrine hide an appetite for the misfortune of others, but the helper at the greenhouse, Teijiro, also confesses a secret he has hidden for years. Koji sleeps with his daughter Kimi when she visits the village; the estrangement from her father is a mystery to everyone in the village. Yet upon learning of her departure, Teijiro nonchalantly confesses to Koji that Kimi chose to leave the village after he raped her. The sudden confession about this incestuous affair shocks Koji—the reader too, no doubt—and suggests how even the least suspecting characters have a dark secret, and that the quiet village, too, is home to many secrets under its tranquil exterior.

Mishima is said to have been rather serious about the field work he conducted for his novels, taking the upmost care in immersing himself in the areas that appear in his writing. *The Frolic of the Beasts* is no exception, and the vivid portrayals of the countryside elevate the level of realism and immersion for the reader. Mishima also describes the time Koji spends in prison, writing at great lengths about the peculiar customs of prison life one can only imagine Mishima had learned from inmates

themselves. *The Frolic of the Beasts* presents at its start the assembly line workings of the prison bath house, a dingy dilapidated facility that nonetheless excites Koji in some way for its organized and *repetitive* structure; Mishima goes so far to call the gathering of bodies for three minutes at a time, in and out of cubicles as, "something of a marvelously pure sanctity" (14) that Koji is constantly reminded of throughout the novel. Koji relates the customs of the prison when he speaks of the *gori,* the way inmates used a comb scratched on a rough surface to light cigarettes, or the practice of using a dustpan in turn with the window as a makeshift mirror to see one's self before leaving prison; having no mirrors, inmates grew increasingly concerned with their image when their release drew near.

While the casual reader may find themselves roused into confusion by its nonlinear plot and presentation, fans of Mishima that possess an apt knowledge of his influences will know what to expect and look forward to rereading the novel to enjoy it in its entirety. Thanks to the masterful translation by Andrew Clare, another work by Mishima joins the growing catalog of his work in English, and while it may not compare to his greatest writings, it still has lasting merit and plenty of potential for a novel that has otherwise been overlooked in Mishima's career.

NOTES

[1] Damian Flanagan, "'The Frolic of the Beasts': A Mishima Classic, Roused from Its Long Hibernation," *The Japan Times*, November 24, 2018. https://www.japantimes.co.jp/culture/2018/11/24/books/frolic-beasts-mishima-classic-roused-long-hibernation/.

[2] See Yukio Mishima, *Five Modern Nō Plays,* Translated by Donald Keene, Vintage International: 2009, and *My Friend Hitler,* Translated by Hiroaki Sato, Columbia University Press: 2002.

[3] Mikiko Ishii comments on some of the typical ways in which Noh theater programs are structured, and she particularly points out how these stories are relayed via a kind of interview between supporting characters—usually a page or travelling monk—and the main characters of the story.

[4] *The Frolic of the Beasts,* p. 96. Subsequent references to Mishima's novel will be in bracketed pages numbers within the main text of the review.

Possessing Polynesians: The Science of Settler Colonial Whiteness in Hawai'i and Oceania

Reviewed by RANDIZIA CRISOSTOMO and HA'ANI SAN NICOLAS

Possessing Polynesians: The Science of Settler Colonial Whiteness in Hawai'i and Oceania, by Maile Arvin. Duke University Press, 2019; Paperback, 328 pages; $27.95.

In *Possessing Polynesians: The Science of Settler Colonial Whiteness in Hawai'i and Oceania*, the Kānaka Maoli scholar Maile Arvin captivatingly articulates a settler colonial possession of Polynesians as a method of examining how whiteness, as a type of mechanism or tool, is employed through both a literal possession of physical entities, such as bodies, land, or ideologies, and a more spectrally metaphorical understanding of the term. This is concretely contextualized within the scope of Hawai'i and among its Indigenous people through anti-blackness and gendered heteronormativity.

Arvin's approach to possession draws from what Patrick Wolfe has famously described as the "logic of elimination" (389), an active removal of the native that is central to the settler colonial project; and from Avery Gordon's theorization of haunting as a "reality that analyzes the lingering impact" (63) of the horrors and histories of settler colonial possession of Polynesian bodies and land.

Arvin introduces the text by stating, "Polynesia is a project, not a place" (1). In this regard, her first two chapters excavate the processes by which settler colonial logics use whiteness to legitimize possession, notably through the vectors of anthropology and race. The fundamental logic of possession was to establish that whiteness was indigenous to Oceania, specifically in the region of Polynesia. Arvin details this process in relation to the historical "Polynesian Problem," the early 19th century scientific framework used by white scholars to connect the racial origins of Pacific Islanders to that of the Aryan race. In doing this, white settlers legitimized "claims of belonging to Polynesia while [relieving] colonizers' racial anxieties about those they dispossessed" (4). According to Arvin, it follows that this exact racial reasoning was used to distance Polynesians from whiteness and identify them as degenerative, never truly actualized white bodies. These chapters portray the extensive, and arguably outrageous, lengths and venues that white settlers took to claim a biological connection to Polynesian indigeneity in order to justify territorialization of land while further absolving accountability of any ongoing violence caused by whiteness.

The third chapter explores the dispossession of the native in approximation to whiteness as evidenced in the fetishization of the "Hawaiian girl." Working with the idea of Hawai'i as a United States racial laboratory, Arvin addresses the inherently biological underpinnings of racial mixture, such as the ideologies of hybridity and hyperdescence, in the actualization of a multicultural state, whereby Kānaka Maoli

women were objectified by white men and still expected to reproduce the ideal, mixed-race Hawaiian. The author engages with historian Tavia Nyong'o's argument that antiblackness is evident in the "fear of phenotypic blackness" (118) in Polynesian bodies, which is remedied by a racial hybridization of the Native Hawaiian. The construction of the "Hawaiian girl," then, is further evidence of the heteropatriarchal, gendered, and misogynistic structures situated within an embodiment of settler colonial whiteness.

In chapter four, Arvin historicizes the topic of blood quantum with regards to the federal recognition of Native Hawaiians by looking at the infamous case of *Day vs. Apoliona*. This is a moment where Kānaka Maoli "called the law on [themselves]" (154) and sought exclusive membership from the settler state through the same logics of possession that were used originally against them. By retracing the details of this landmark case, Arvin succeeds in conveying the contentious nature of Indigenous peoples engaging in settler colonial whiteness. Yet, in a more significant manner, Arvin questions blood quantum as a "technology 'not of our own making' but nonetheless one that has become an undeniable part of many Native nations" (145) and confronts the politics of recognition by including Kānaka Maoli *ʻaʻole* as a form of regenerative refusal evinced in the community commentary at the Department of Interior hearings for the Akaka Bill.

Following *ʻaʻole*, the fifth and sixth chapter similarly challenge whiteness and the ideological possession of it through various mediums of regenerative refusals. In direct contestation of the settler colonial technologies intended to possess them, Arvin details the moves beyond race in which Native Hawaiian, Samoan, and Māori defy racial purity logics grounded within the Hawaiian Genome Project along with artistic modes of resistance to white commodification and aesthetics that are "painfully overlaid onto Indigenous Pacific bodies daily" (222). Arvin further invites the reader to pay close attention to the regenerative refusals of genome science and the ways in which Indigeneity is defined within Polynesian worldviews and futurisms.

Although Arvin diversifies her work to include figures and histories throughout Pasifika, such as Te Rangi Hīroa of Aotearoa, and Samoan artist Yuki Kihara, whose photograph "A Study of a Samoan Savage" dresses the cover of the book, there is still so much left untouched with regards to exploring whiteness outside of Hawai'i. Subsequent work by scholars of Oceania can utilize Arvin's book alongside stories focused on other Polynesian nations such as Samoa, Tonga, Tahiti, as well as stories of other nations within Micronesia and Melanesia, in order to fully represent the logic of possession throughout the entirety of Pasifika. For instance, analyzing the logic of possession as it pertains to both past and present Chamoru experience within both Islas Mariånas and the diaspora, would add nuance to the conversation of settler colonial whiteness. In doing this, one can take on Arvin's concluding call to challenge racial hierarchies throughout Pasifika and instead, as famed Epeli Hauʻofa writes, reestablish our sea of islands (152) and foster deeper connections and solidarity beyond the cartographic divisions of Polynesia, Micronesia, and Melanesia.

Ultimately, *Possessing Polynesians* is a fascinating text that deepens our understanding of the biopolitical histories of possession and the lasting impact of

settler colonial whiteness as Indigenous Pasifika communities know and experience it today – but more importantly how they continue to refuse and contest it.

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Our Voices, Our Histories: Asian American and Pacific Islander Women

Reviewed by Paulette M. Coulter

Our Voices, Our Histories: Asian American and Pacific Islander Women, by Shirley Hune and Gail M. Nomura, editors. NYU Press, 2020. 520 pages. Paperback, $35.00; Kindle, $19.95.

Every now and then, I come across a book about which I can say, "This is really good!" That was my response upon completing a read of Shirley Hune and Gail M. Nomura's 2020 *Our Voices, Our Histories: Asian American and Pacific Islander Women*. In 2003 Hune and Nomura edited and published *Asian/Pacific Islander American Women: A Historical Anthology*. *Our Voices, Our Histories* is not an updated version of the earlier text; although it contains chapters by five authors from that text, it is an entirely new volume of eight parts, comprising 26 chapters based on new research that uses a variety of methods: documentary evidence, participant observation, case studies, interviews, and surveys. Because of this quantity not all chapters are reviewed in detail. All page numbers refer to pages in *Our Voices, Our Histories* by Hune and Nomura unless otherwise indicated.

Both Hune and Nomura introduce the text, Nomura on "Voices" and Hune on "Histories." Nomura states that the editors' intention is to "foreground the agency, power, and resilience of Asian American and Pacific Islander women and their capacity to enact change and transform their lives and communities within local, transnational, and global contexts" (1). In so doing, she directs attention to the issues of the diverse histories of these women, including "intersections of race, gender, class, sexuality, indigeneity, [and] ethnicity," among others (ibid). Nomura also provides working and legal definitions of "Asian American" and "Pacific Islander" (1-3). On the other hand, Hune explains the organization of the text and its themes: women's agency, resistance and resilience in the face of challenges, and development of new identities (12); applying the dimensions of globalism, exclusion, and gender in the research (8-10); and using historical methods of print and archived materials as well as new media such as film, video, and self-created digital sources in the narration of stories and histories (12).

Justifying its title, the book is divided into eight sections or "parts" based on historical time periods from early Western contact with Asia and the Pacific to the near-present and contains chapters on and by Asian American women from China, Japan, Korea, the Republic of the Philippines, South Asia, Southeast Asia, and Taiwan, as well as Pacific Islanders from Guam, Hawaii, Tonga, and Samoa.[i]

In Part I "Early Era: Indigenous and Global Roots," chapter 1 "Malamalama: Reconnecting as Native Hawaiian Women through Cultural History," Davianna Pomaika'i McGregor discusses the traditional roles of women in Hawaii throughout

history. After an initial focus on the 'Ohana effort to stop the bombing of Kaho'olawe, used as a training ground for the United States (U.S.) military from 1940 to 1990, McGregor turns her attention to preservation of Hawaiian culture, language, and the roles of women in those efforts. In particular, she explores contemporary challenges "Native Hawaiian women face" by examining traditional cultural roles, how these roles changed in the process of Americanization and statehood, and how Native Hawaiians can perpetuate their beliefs and customary practices despite these challenges (20ff), always emphasizing the roles of women.

In chapter 2 Erika Lee discusses "Global Roots and Gendered Routes: Early Asian American Women's History" of migration, and in chapter 3, "Two Sisters, Two Stories: Transnational Lives of Ume Tsuda and Yona Abiko," Masako Iino presents the story of the founding and funding of what is now Tsuda University in Japan.

In Part II, with its emphasis on "New Intersections of Race, Gender, Generation, Communities," chapter 5, written by Phonshia Nie, provided for this reader entirely new information in "Stretching the Boundaries of Christian Respectability, Race, and Gender during Jim Crow: Chinese American Women and the Southern Baptist Church." Jim Crow laws in my mind heretofore have been linked primarily to Blacks in America, and while I was aware of the Chinese immigrants in the West and Southwest relative to the building of the railroads, I was not aware of Chinese in the South. I thank Nie for stretching the boundaries of my knowledge.

Chapters 4 and 6, by Dawn Bohulano Mabalon and Mana Hayakawa, respectively, present women's community building and family support practices in pre-1965 California and the way San Francisco nightclub "all-Chinese revue[s], " since they contained non-Chinese Asians, complicated both racial and gender stereotypes during the 1930s through the 1960s

Part III also contains three chapters: they focus on "New Cultural Formations, New Selves." Chapter 7, by Christine R. Yano, concentrates on language and speech performance of Japanese American girls as a means of this transformation. Chapter 8, on mixed-race identity formation of Asian-American women over the life course, is written by Cathy J. Tashiro, and in chapter 9, M. Luafata Simanu-Klutz discusses the relationship between ancestral ethics and identity among Samoan women in the American diaspora. American culture not only differs from Samoan but is "anathema to Samoan notions of power, wealth, and worship" and to Samoan understanding of "universal values and principles" and their interpretation (155).

Chapter 7 is one of two chapters in *Our Voices, Our Histories* for which the topic is primarily language, in this case, *language as performance*. Yano states that Japanese Americans in Hawai'i in the 1950s and 1960s bestowed the comment, "She speaks well" on "other nonwhite women who stood apart linguistically as a model for emulation" (125). The comment, made by women, refers to noticeable use of Standard English and assumes that most nonwhites in Hawai'i at that time did not speak English well. The comment is also gendered: "women, more than men, should speak to a higher standard of English as evidence of their citizenship" and assimilation (ibid.). Thus, women are both the evaluators and the evaluated. And the evaluation extends to more than everyday speech because until 1960, nonhaole children who wished, or whose

parents wished for them, to attend the English Standard schools had to pass a spoken English test for entry (127). These schools were set up "in 1924 by petition to the territorial government from a handful of haole mothers who did not want their offspring commingling with children of other races," in other words, a form of racial segregation (126). This racism became even more prevalent during World War II.

Yano presents two case studies that demonstrate the societal rewards of speaking well. One is the Cherry Blossom Festival Queen Pageant that began in 1953 (129); the other is Pan American Airlines' development of a Nisei stewardess program in 1955 for around-the-world flights. While Japanese was a requirement for the job, so was "high-functioning English"; of the first seven stewardesses, five were from Hawai'i (133). They were also some of the earliest nonwhite stewardesses in the airline business (135). For the pageant, because it was run by the Honolulu Japanese Junior Chamber of Commerce, "the women onstage thus proved the male organizers' worth" (129) and established a standard for "wives of certain performative stature" (130). The winner, and all contenders, had to be a good speaker in order to represent her community well in public (ibid.) because she "carried the mantle of the Japanese American community upon [her] shoulders" (132). Yang concludes that both of these groups of young women served "as a central proving ground in postwar Hawai'i for citizenship, economic status, and identity" (138), primarily on the basis of speaking well!

In Part IV "Wartimes and Aftermath," chapter 10 is written by Alice Yang. She emphasizes the mobilization of Japanese American women seeking redress and healing from "Memories of Mass Incarceration." She focuses on the second (Nisei) of three generations of women who were active in seeking redress for their imprisonment, using "interviews with activists, government testimony, and women's voices drawn from secondary literature and memoirs" (173). In actively seeking redress, these Japanese American women struggled with patriarchy and racism that generally did not allow women to be active in public spheres; yet they organized among themselves and, given impetus from the women's, civil rights, and antiwar movements, testified before the Commission on Wartime Relocation and Internment of Civilians. In 1981 the Commission concluded that the imprisonment of the Japanese in America during World War II was, as quoted by Yang, "a 'grave injustice' caused by 'race prejudice, war hysteria and a failure of political leadership'" (173). Even that may be an understatement.

In chapter 11 in Part IV, Yên Lé Espiritu examines the "Refugee Lifemaking Practices" of Southeast Asian women from Cambodia, Laos, and Vietnam. Most research on these refugees focuses on men and their military experiences and suffering. Espiritu, using "existing oral histories and interviews," focuses instead on women's "desire-based" (rather than "damage-centered") efforts "in wartime, in the refugee camps, and in resettlement" (189). Although these experiences were difficult, they also provided opportunities for women to loosen the bonds of patriarchy in their traditional cultures and to assert their own agency. Chapter 12, by Linda Trinh Võ, has one of the most tantalizing (in this reviewer's opinion) titles in the book: "'Defiant Daughters': The Resilience and Resistance of 1.5-Generation Vietnamese American Women." This chapter is a case study of six such women in Southern California with

whom the author has worked and on whom she focuses, "based on their visibility as public figures and for their accomplishments in their fields" (205). She uses both primary interviews and secondary research of archival material and finds that even now the traces of war in Vietnam "continue to create a survivalist mentality and ideological divisions within Vietnamese American families and communities" with which women must cope in their daily lives.

The topic of Part V is "Globalization, Work, Family, Community, Activism" in the period of 1950-2016. In particular, in chapter 15 Maria W. L. Chee analyzes "Women's Agency and Cost in Migration: Taiwanese American Transnational Families" among those who bring their children to the U.S. for educational opportunity. What happens when one parent moves to the U.S. with the children while the other remains in Taiwan to work and support the rest of the family? Chee "conducted two surveys in Southern California from 1999 to 2000 and thirty-five semistructured interviews with women from 1999 to 2001" to gather data and find answers (254). The women ranged in age from the forties to the sixties and were generally educated and non-working class (ibid.). Of these Taiwanese immigrants, "most came for their children's education," to have access either to special education or to improved chances of entrance to U. S. universities, with 60% coming "for status attainment or social class reproduction" (256), a transnational application of a concept forwarded by Pierre Bourdieu (cited in Chee 254; 266, note 1). The decision to migrate was sometimes made by the husband (42.8% of cases), sometimes by the couple (22.8%), and least frequently by the wife alone (14.3%) (258). In some cases the transnational situation improved the marriages (20%) while other marriages ended in divorce, in part supported by the gender inequality inherent in Taiwan's legal system (264). Chee concludes that her data support Bourdieu's theory in that numbers of children were successful in attaining a good education (265), thus accomplishing social class reproduction.

Part V also contains three labor-related chapters: chapter 13, "Precarious Labor: Asian Immigrant Women, 1970s-2010s" by Krittiya Kantachote and Rhacel Salazar Parreñas; chapter 14, "The Backbone of New York City's Chinatown: Chinese Women and the Garment Industry, 1950-2009" by Margaret M. Chin; and chapter 16, "'Revolutionary Care' as Activism: Filipina Nurses and Care Workers in Chicago, 1965-2016" by Joy Sales.

Part VI focuses on "Spaces of Political Struggles." Sharleen Santos-Bamba and Anne Perez Hattori discuss "The Mother's Tongue: Language, Women, and the Chamorros of Guam" in chapter 17. Judy Tzu-Chun Wu examines Patsy Takemoto Mink's political career and legislative activism, with an emphasis on her role in the passage and maintenance of Title IX in chapter 18; Trinity A. Ordona discusses work with activist groups in "Opening the Path to Marriage Equality: Asian American Lesbians Reach Out to Their Families and Communities" in chapter 19. Finally, Monisha Das Gupta and Soniya Munshi analyze "Turning Points: South Asian Feminist Responses to Gender-Based Violence and Immigration Enforcement" in chapter 20.

Santos-Bamba and Perez Hattori explore the effects of language policies enforced on Guam under Spanish, Japanese, and U.S. colonialism and the traditional and current role of women in maintaining the language and culture of the Chamorros

of Guam. They examine "the intricate mix of economic, political, and social issues that have informed which language would, indeed, be the mother's tongue and highlight [. . .] Chamorro women's activism in that struggle" (288). Like many indigenous languages, the Chamorro language may be on the verge of extinction, according to Dr. Laura Torres Souder (287). Traditionally and historically, men and women have shared power, and "Chamorros defined identity through membership in clans determined by maternal lineage," giving mothers a dominant role in language acquisition and use (289). Under American dominance, with its "English only" policy, from 1920 to 1945 Chamorros spoke Chamorro at home and in church and English "for academic and professional endeavors" (293). After the war, however, mothers "championed English acquisition," not foreseeing the effect this might have on their children or on their native language (294). From 1966 to 1985, after the creation of the Chamorro Language Commission in 1964 (297), a third generation has "attended school [. . .] when both English and Chamorro were recognized as official languages" (295). Nevertheless, and despite recognition of its cultural value, the authors acknowledge that use of the Chamorro language has not increased but rather declined (300).

Locating Asian American adoptees in America, wearing the hijab in public places, and "Navigating the Hyphen: Tongan-American Women in Academia" (examined in Discussion below) are the topics of chapters 21 through 23. Each chapter addresses one or more aspects of the title of "Part VII: New Diasporas, Diverse Lives, and Evolving Identities." Asian American adoptees are unique among diasporas in that, as the cases Kimberly D. McKee discusses in chapter 21 indicate, adoptees who feel out of place in their white adoptive families may be unable to find their Korean families and, when they do, feel out of place in Korean society because they know neither the language nor the culture. Further, many become aware of their dilemma, before Web 2.0 media, through first-person accounts in text and film created by other Korean adoptees (357-58). McKee concentrates on the memoirs of Jane Jeong Trenka and films by Deann Borshay Liem to investigate the process and consequences of adoption practices in the period after the Korean War. She concludes that the disruptive voices of women have exposed and must expose the irregularities of those processes, irregularities great enough to elicit an apology to adoptees from President Kim Dae Jung in 1998 "for the nation's adoption practices and includes adoptees as 'overseas Koreans'" (369). McKee also concludes that "[a]doption complicates ideas of the Asian American experience," for "Asian American" is not a homogeneous category (ibid.).

In chapter 22, "'Let Them Attack Me for Wearing the Hijab': Islam and Identity in the Lives of Bangladeshi American Women" Nazli Kibria uses her experience of participant/observation in Bangladeshi community and family events and oral history data she collected through interviews with 72 Bangladeshi Americans (male and female) from 2001 to 2007. Here she focuses on four women and the formation of their Muslim identity amid the political tensions of post-9/11 America. One of the women wears the hijab in America to declare her religious identity and to provide a religious example for her children (379); a second woman also expressed that her association with her religion has increased along with her feeling of dislocation in America, and

she wants something more certain for her children (380). A third woman's personal crisis with depression helped her learn more about Islam "as a complete way of life" (382). This woman found that establishing a social network of people who share her commitment to Islam, whether Bangaladeshi or not, freed her from the restrictions imposed by her family and gave her a sense of personal agency (381-82). The fourth woman views her Muslim identity in political more than religious terms, though religion is not absent from her view. Her college education enhanced this point of view (383-84).

The final three chapters, in "Part VIII: Gender, Cultural Change, Intergenerational Dynamics," focus primarily on linkages and belongings of particular groups of women: Korean American daughters and their parents (by Barbara W. Kim and Grace J. Yoo), professional Hmong women operating within their professions and their patriarchal families (by Chia Yougee Vang), and the sharing of "Stories and Visions across Generations: Khmer American Women." Of these, the last, chapter 26, reports on a project in which stories and visions are being shared digitally through a project developed by Shirley Suet-Ling Tang, Kim Soun Ty, and Linda Thiem of the University of Massachusetts Boston. Information on this project is provided in the Discussion below.

Hune and Nomura conclude the book with a short section titled "Reflections," reflections on the book's intent––to re-envision Asian American and Pacific Islander women' histories and to make their voices of "new scholarship more available to a wider audience" (457) as well as revelations of the authors' personal journeys. The book also contains acknowledgments, information on the contributors, and an index. Notes are included with individual chapters and provide an array of resources for additional research. The book is available in hardcover and paperback from the publisher and in hardcover, paperback, and e-book at Amazon.com, where prices are slightly lower. For reasons of both speed and cost, I chose the e-book; for one thing, I wanted to read the relevant chapters of the speakers included in the Zoom book-launching webinar on 27 October 2020, and I knew the hardcover copy would not arrive in the mail in time. The e-book is a bit disappointing in that section headings within chapters appear to be truncated, often only a single word, like "The," which is not specific, and I hope this is not the case in the other formats; the presence of even these headings does, however, signal possible shifts in focus and meaning.

Discussion

In terms of methodology, the authors in *Our Voices, Our Histories* employ a variety. Authors Yano, Chin, Ordona, Kibria, and Yang used participant observation in their research. Tashiro and Chee performed surveys as a method of data collection for chapters 8 and 15, and many authors either use or produce case studies. Many also use interviews and oral histories or memoirs, and, as chapter notes indicate, *all* authors did documentary research to gather and analyze data.

Like any anthology, *Our Voices, Our Histories* may be uneven, though apart from the headings in the e-book, the editing of the book is good and has worked on

evenness of readability and depth of investigation. The most serious need I observe in the book is the need for *more*: more research and more publication, please. For example, chapter 23, by Tongan Americans Halaevalu F. Ofahengaue Vakalahi and Ofa Ku'ulei Lanimekealoha Hafoka, deals with a population of two, the authors themselves. They acknowledge "their extremely small population size, academic and political underrepresentation, and historically aggregated data and exclusion as participants and researchers in major studies" (390). They add, however, that "there are about a dozen known Tongan-Americans who hold the doctor of philosophy (Ph. D.) degree" and that 50% of them are women (391). These authors provide a mere glimpse of the possibilities of studies of this population, among them a study of the "[r]acism, sexism, prejudice, discrimination, microaggression, gender-based pay inequity, and presumptions of incompetence [that] are common experiences of women of color in academia" (397), an environment predominantly white and male. More research is needed.

More research is also needed on and by the women of Micronesia, Melanesia, and Polynesia, in fact, all the women of Oceania. Another area asking for development is the application and testing of social science theory/theories. Chee (chapter 15) provides a good example of application of theory. Her research not only supports "Bourdieu's concept of social class reproduction in France" (264) but also "challenge[s] the assumption of Blood and Wolfe's resource theory" and "Traeger and Young's assertion that wives have limited influence on a family's migration decision" (265). Blood and Wolfe had suggested that because women have less earning power they also have less power in the household (ibid.). The joint decision-making of sixteen of the Taiwanese couples and the independent choices of five of the women, or more than half of the cases, indicate otherwise (258). Chee's use of statistics also enhanced understanding of her data.

One significant area for further study is the application of U.S. local, state, and federal law relative to immigrants' daily lives. The primarily historical chapters in the book discuss immigration law at various lengths, especially the Chinese Exclusion Act. Chapter 20, "Turning Points: South Asian Feminist Responses to Gender-Based Violence and Immigration," by Monisha Das Gupta and Soniya Munshi, however, concentrates on a real problem in some women's lives: domestic violence. Applying the requirements of immigration law to these situations may have unintended consequences of great magnitude; the solution may be greater than the problem, at least in New York State, for, "[s]ince 2012, the federal government has required New York State to share arrestee fingerprints collected by local police with immigration enforcement" (338). In the most extreme case, the arrestee might then be deported, repatriated. What happens to the woman and the family's children if they are left without the financial support of the primary breadwinner? More research needs to be done to examine this and similar cases.

A final area requiring development is the study and use of film, video, and digital media. Ordona has noted the influence of the film on challenging "the marginalization of gay and lesbian people" (323), and McKee has examined the use of film (as well as texts) to promote adoptions (359) and to assist adoptees in understanding their

personal situations (364, 366-68). Finally, Shirley Suet-Ling Tang, Kim Soun Ty, and Linda Thiem have added a new dimension to documenting and sharing "a wide range of personal, family, and community histories" through the use of "interdisciplinary and bilingual/bicultural methods of inquiry, expression, and coproduction through oral history, digital storytelling, performance poetry, autohistoria, public exhibition, thematic narrative analysis, and reflection-action praxis within structured Asian American studies environments" (441) among the Khmer and Cambodian refugee and immigrant populations in Lynn, Revere, and Lowell, Massachusetts. Tang has been working on these projects since the 1990s (440). The promotion of intergenerational communication is a worthy goal, as is each of these projects individually. In addition to completing their many projects themselves, however, recording and sharing their methods and results with other such populations is also desirable. This final chapter of *Our Voices, Our Histories* is a starting point.

Who, then, is the intended audience of *Our Voices, Our Histories*? Clearly, the book can be used as a central text in Women and Gender Studies programs, as the 2003 Asian/*Pacific Islander American Women: A Historical Anthology* has been used. *Our Voices, Our Histories* may also be used in any of the social sciences for both its content and methodologies, or by anyone who wants to hear of positive things accomplished by women despite daily challenges, and also by anyone who likes a really good book!

Notes

[1] The words *Samoa*, *Malamalama* in all their variations should contain a long vowel mark (macron) over the first *a* and above the *o* in *Pomaika'i*. The author surname *Yên* should have an accent aigu (right-slanting) as well as the circumflex above but not next to the *ê*.

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New Dark Age: Technology and the End of the Future

Reviewed by C. S. SCHREINER

New Dark Age: Technology and the End of the Future, by James Bridle. Verso Books, 2018; 294 pages; Paperback, $16.95.

It is commonly known among market experts and consumers that, unlike movie theatres and bookstores, the business model of Netflix is perfectly suited to optimize profits during pandemics, and that one of the most popular domestic pastimes while "sequestering in place" has been binging and "chilling" on Netflix and other media streaming platforms. In a recent article, a respected technology critic remarks that his most frequent pandemic activities, which absorb more than six hours per day on average, are "doomscrolling," which is scrolling through bad news, binging on Netflix, watching home improvement videos on YouTube, and playing online video games. Book reading is not mentioned.[1]

Well then, what about book reading? How does a pandemic challenge those for whom reading is an intrinsic necessity, those who, if deprived of reading, would not be themselves? Independent bookshops have been shuttered until further notice, or offer curb service, which is not the same as leafing through books in a cozy corner. But Amazon has done a brisk pandemic business in Kindle downloads. If one is averse to downloading digital texts when books are available at home, a noble alternative consists of rereading favorite titles in one's home library—a book apropos of pandemic indolence such as the Russian novel *Oblomov* (1859), about a phlegmatic landowner that will not get out of bed because he sees no justifiable reasons for doing so. Sequestering in place is Oblomov's stubbornly enforced passive lifestyle. Not exciting enough for you? Well then, wear a mask when you go to the post office to pick up your books ordered online. Sanitize your hands before and after… A new book should ideally be fresh enough in its approach to bring novelty to the *tedium vitae* of pandemic sequestering, but also stir something inside us that resonates with our experience and seems pertinent without being trendy or entertaining. Some of my students have good naturedly recommended that I should read *entertaining* books during a global crisis. Can someone explain why so-called *serious* books are inappropriate during times like these?

You guessed it: James Bridle's *New Dark Age: Technology and the End of the Future* is a serious book, but it is engaging and readable. Books about technology that are detailed, well-researched but accessible to a non-specialist audience comprise a genre that should appeal to a diverse readership since almost everyone is immersed in some sort of technological milieu. Yet I personally do not know anyone who reads books like *New Dark Age: Technology and the End of the Future* (or, for that matter, anyone who writes them). This is unfortunate, as Bridle's book achieves admirable coverage in its effort to express a synthetic understanding or general ecology of daunting, seemingly unrelated technologies that have altered existence in the

Anthropocene. Such synthetic feats of writing, already impossible for most scholars and citizens overwhelmed by information, who "try to engage in the least amount of cognitive work they can get away with,"[2] strike me as rare gifts of research we cannot afford to ignore. In his recently published intellectual memoir, Howard Gardner, whose own career has been distinguished by its synthetic approach to research, observes that such publications are becoming infrequent. "I am concerned that such works of synthesis may on the wane. Alas, the trend in the academy is toward an ever sharper focus on highly technical quantitative work within standard disciplinary boundaries."[3] Indeed, the professors that I know rarely read outside their fields of research, and I am unfamiliar with students who read books that have not been assigned or that do not represent a trending Netflix or HBO series such as *Game of Thrones*. When I was a graduate student, I knew a Dutch engineer who did consulting for Perkins Elmer and worked on an obscure component of the Hubble telescope. Always humble, he did not consider himself a scientist but a "technician," and we often enjoyed lively discussions of generalist books about science in which we shared an interest—books such as Hans Moravec's *Mind Children* (1988) and *Descartes' Dream* by Davis and Hersch (1987). In our wine-fueled discussions, we often found ways that the book we had read dovetailed with our personal interests and professional lives.

In this regard, I recently had an online experience that concretely exemplifies a problem investigated in James Bridle's *New Dark Age*. After being enthralled by a sermon on YouTube orated by Rev. Michael Curry at the Washington Cathedral on the eve of the presidential election in 2020, I sent the YouTube clip to a relative in northern Vermont.[4] Although I had much to say about the sermon, I restrained myself from predisposing the recipient, merely noting that I was "astonished" by the sermon, that it is twenty-seven minutes long, and they should give themselves the gift of paying undivided attention to the sermon. This was the heartfelt recommendation of an old friend who had sent me the sermon, which I followed in earnest, and responded to in kind. The next day, I received an email reply that contained links to *seven* other sermons by Rev. Curry on YouTube without any comments except, "Rev. Curry is famous!" Now, what do you think concerned me? I think what occurred in our exchange, and in much of what passes for communication online, is unreflective or reactive *file transfer*. One of the common complaints voiced by students about remote learning is that most of the exchanges with the instructor amount to impersonal file transfer and downloading. ("See attached article. Read it, then post your responses to our Moodle forum by Thursday at 6:00 pm.") It troubled me that there was no appreciative, critical, or at least personally nuanced response to the individual sermon, delivered by Rev. Curry on Nov. 1st, but only more sermons. The urgent specificity of that sermon went unheeded. Poof! Gone. It was as if the impressive *quantity* of sermons was a statement about their *quality*, or further evidence of the Reverend's celebrity, something in which I have no interest. The sermons were reduced to material that can be immediately distributed without listener participation. I certainly did not have the wherewithal to process all those sermons, each of which would surely be captivating in explicit ways that would require my fully engaged attention. In short, the response to the sermon I sent contributed to the glut of information that is constantly being churned

and distributed without individual engagement. More material is not "better" than less if the material is, well, precisely that—unprocessed material.

This problem, "the poor returns on overwhelming flows of information" (214), is one that James Bridle takes up with impressive rigor-- the way the tsunami of information in our lives does not clarify anything but only makes everything more incomprehensible, so we just pass shards of it along, uninterpreted, as a way to cope with ceaseless incoming information. This problem of file transfer has been accelerated and magnified by digital technologies such as Twitter, whose most popular feature (made infamous by Trump) is to "retweet" or forward tweets that the recipient has not bothered reading. Many users of Twitter are not exegetes or critics but insentient relays—mere reactive synapses in a vast and irrational commotion of sending and receiving.

One of several recent investigations of what Erich Hörl has called the "technological condition,"[5] James Bridle's *New Dark Age* describes large-scale technical developments that have become seamlessly integrated with human existence beyond its comprehension. These developments include surveillance culture, artificial intelligence, drone deployment, climate science, robotic workforce and factory systems, social media, and the new media ecosystem of automated entertainment systems such as YouTube and online video games. Bridle writes dense but jargon-free prose in reporting the intricacies of these technological developments and systems. His critical positioning is sharp and consistent without being overly tendentious, neither a jeremiad nor personal grievance.

Of recent milestones in technological reporting for a popular audience, Nicholas Carr's well-written book, *The Shallows* (2011), which first appeared three years earlier in an article in the *Atlantic*, "Is Google Making Us Stupid?", achieved a popularity uncommon for a serious investigation of the alarming and often regressive influence of digital technology in our lives. The success of Carr's book can be attributed to its focus on recognizable lifestyle and literacy changes inculcated by digital apps, and to the personal anecdotes evincing those changes that Carr tactfully distributes throughout his text. Bridle's *New Dark Age* is less personal, and it covers a wider range of topics whose technical complexity will arguably diminish his readership regardless of his accessible prose.

On the other hand, Bridle's book will surely reach more readers than Bernard Stiegler's formidable work, *The Age of Disruption: Technology and Madness in Computational Capitalism* (2019). Stiegler, who passed away in August, 2020, penetrated more profoundly than anyone else into the epistemological alterations in consciousness, attention, and memory effected by digital technologies and the industrialization of desire, alterations which he argued had a catastrophic impact on human development, family life across generations, and educational learning outcomes. However, Stiegler had a habit, stubbornly persisting in all his writings, of coining convoluted philosophical neologisms that could only antagonize and alienate the so-called common reader. On an informal scale of accessibility ranging from most accessible (1) to least (10), Carr's book would merit a 3, Bridle's a 6, and Stiegler's a 9 or 10.

Bridle does not critique everything technological as comprising a new Dark Age, but he leverages the metaphor of darkness to argue that technology progressively occludes itself, its own internal logic, from its human users and customers, such that decoding or disclosing its meaning and significance becomes ever more difficult. Bridle calls this problem "technological opacity" (119), an ever-expanding shadow that both eclipses and envelops civilization even as users adopt ever more technologies. That image of encompassing darkness reverses the image of enlightenment culture, which increases our light, our literacy and secular understanding. In other words, the question of technology for humans is foremost a hermeneutical problem—how to understand the digital programs and platforms that have colonized the lifeworld. To speak of a new dark age, then, is entirely different than to speak of a dark epoch like the Middle Ages when knowledge was inaccessible to the millions of European citizens who could not read Latin. Today we have a surplus of knowledge; and while illiteracy is no longer the main darkening force in our lives, the sheer amount of knowledge produced by increases in raw computing power, following Moore's law, creates a condition that is akin to illiteracy in the mute incomprehension with which we gape at Big Data and its "clouds of apparently infinite computational power" (83). Common assumptions about technology as a democratizing force are shown by Bridle to be misguided if not utterly erroneous. "Technology is in fact a key driver of inequality across many sectors. The relentless progress of automation—from supermarket checkouts to trading algorithms, factory robots to self-driving cars—increasingly threatens human employment across the board" (113). Although many critics would agree with this dire forecast about automation technologies, there are no few automation theorists who have a considerably more nuanced if not guardedly optimistic view, arguing that workplace automation will force governments to implement universal basic income to compensate for mass unemployment, and this innovation might "bring us closer to a world of human flourishing."[6]

Some of the examples of technological opacity described by Bridle are frankly disorienting because he scrutinizes the internal dynamics of systems with which we have a superficial and "friendly" consumerist familiarity. Such systems benefit from public trust. Almost everyone shops on Amazon, but how many Amazon customers have peeked inside its warehouses? Bridle takes a close look at basic operations inside an Amazon warehouse where order processing, distribution and shipping occur. Such structures are colossal—Bridle includes a photograph of the Amazon warehouse in Rugeley, Staffordshire, which is nine football fields long. The accelerated pace of tasks is exhausting for the nonunionized employees, who each day push trolleys full of merchandise the equivalent of fifteen miles. Their productivity is monitored by a handheld device which they use primarily like a GPS to find their way about the warehouse, whose cavernous space is counterintuitively configured according to the logistics of "chaotic storage" (115). Without a location tracking device, the workers would become totally lost. This is because the merchandise they pick up (from shelves and stations stocked by strategically situated robots) is arranged in unpredictable ways understood by the robots, not the employees. "Books are stacked on shelves next to saucepans, televisions share space with children's toys…Arranging the world from the

perspective of the machine renders it computationally efficient but makes it completely incomprehensible to humans. And moreover, it accelerates their oppression" (116).

Another vast network with which we are seemingly familiar is online video distribution and content sharing both creative and commercial, systems like YouTube that monetize our compulsions and captivate the attention of children and adolescents. In the same way we use Amazon while remaining largely ignorant of its exploitive labor practices, Bridle argues that venues like YouTube contain inner violence and freakish imagistic distortions of familiar cartoons and movies that largely escape the supervisory vigilance of parents and guardians. As with so many forms of social media and streaming content, public trust (a.k.a. consumer gullibility) blinds users to the obscurely manipulative algorithms that drive them and constitute the inner logic or substructures of the attention economy. No few of these algorithms pervert popular viewer content from sources like Disney after being hacked and usurped by predatory agents. "Kids are being traumatized by these videos. They watch their favorite cartoon characters acting out scenes of murder and rape" (228). Bridle continues:

> Accompanying the violence are untold levels of exploitation: not of children because they are children, but of children because they are powerless. Automated reward systems like YouTube algorithms necessitate exploitation to sustain their revenue, encoding the worst aspects of rapacious, free-market capitalism. No controls are possible without collapsing the entire system. Exploitation is encoded into the systems we are building, making it harder to see, harder to think and explain, harder to counter and defend against. What makes it disturbing is that this is not a science fictional exploitative future of AI overlords and fully robot workforces in the factories, but exploitation in the playroom, in the living room, in the home and the pocket, being driven by exactly the same computational mechanisms. And humans are degraded on both sides of the equation: both those who, numbed and terrified, watch the videos; and those who, low paid or unpaid, exploited or abused, make them. In between sit mostly automated corporations, taking the profit from both sides. (230)

Rogue algorithms and "bots" are increasingly running amuck not only in YouTube, but all over the internet, and not only as spam and phishing lures. The months preceding the 2020 presidential election saw social media infiltrated with bots conveying propaganda, false news reports, and voter suppression rhetoric, often in the form of dire warnings about the mortal dangers of voting. Due to rogue algorithms, global stock exchanges have experienced precipitous volatility, otherwise known as "flash crashes," that wipe out billions of dollars in equity value within a few minutes. However, not all automated codes that infiltrate systems and operate as bots are rogue. The pervasively male membership that comprised the customer base of the dating web site, Ashley Madison, was unknowingly responding to an artificial population of "Angels," or women customers, who were bots. This web site was eventually hacked, and the identities of the customers exposed (238).

It has always seemed astonishing that so many consumers uncritically adopt a new domestic technology without hesitation, whether a home surveillance system or personal assistant powered by Google Home—and these are often linked. Is it public trust or blind faith in technology that compels the average consumer to configure her home with gadgets and systems that link the refrigerator, phone, intruder alarm system, thermostat for air-conditioning and heating, television, stereo, and home computer? Bridle is genuinely concerned that such a fully networked *oikos* or homestead is vulnerable to hackers. "We are inserting opaque and poorly understood computation at the very bottom of Maslow's hierarchy of needs--respiration, food, sleep, and homeostasis—at the precise point, that is, where we are most vulnerable" (128-9).

Most people are under the impression that computing power and digital infrastructures are clean, sustainable, non-polluting technologies. It is as if we value Big Data to such an extent that we give the very idea of computer science and its products a free pass. But Bridle shows that such a tolerant attitude is unwarranted. "As of 2015," he writes, "the world's data centers, where exabytes of digital information are stored and processed, consumed about 3 per cent of the world's electricity—and accounted for 2 per cent of total global emissions. This is about the same carbon footprint as the airline industry. The 416.2 terawatt hours of electricity consumed by global data centers in 2015 exceeded that of the whole United Kingdom, at 300 terawatt hours" (63). These numbers cited by Bridle, while staggering, are miniscule compared to projected increases of energy consumption associated with expansion of digital infrastructure worldwide:

> In response to vast increases in data storage and computational capacity in the last decade, the amount of energy used by data centers has doubled every four years, and is expected to triple in the next ten years. A study in Japan suggested that by 2030, the power requirements for digital services alone would outstrip the entire nation's current generation capacity. Even technologies that make explicit claims to radically transform society are not exempt. The cryptocurrency, Bitcoin, which is intended to disrupt hierarchical and centralized financial systems, requires the energy of nine U.S. homes to perform a single transaction; and if its growth continues, by 2019 it will require the annual power of the entire United States to sustain itself. (63)

The kind of information provided by Bridle in passages like the above conflicts with commonly held utopian conceptions of technology and the internet, which share a narrow, domestically sheltered belief that machines are becoming smaller, cuter, and more energy efficient. The average user of a laptop has a vague impression that it requires little power and leaves a minute carbon footprint. This impression, while correct, excludes the computational infrastructure of server farms and data storage installations, such as those provided by the company, Iron Mountain, which require disproportionate amounts of power as Bridle shows. Hence, the average laptop user is

unlikely to perceive a link between his cute, inconspicuous MacBook and global warming, but that link is irreducible unless the laptop is solar powered.

At some point, technologically enabled cultures, institutions, and workforces spellbound by the convenience and speed of their machines will have to sober up and begin to think of them as integral to general ecology. Right now, there is a distinctly willful but illusory separation between the everyday lifeworld, colonized by technologies, and media-generated representations of disruptive and dystopian futures. Those remain curiously distant futures in the minds of technologically enabled and addicted users. But in fact, those futures have already begun to show themselves, albeit in passing glimpses, isolated developments. As Bernard Stiegler argued before his untimely death, the Age of Disruption is here. He did not live to witness Trump's irrational and seditious efforts to overturn the outcome of the 2020 election, supported by fans who were stirred to violence by social media monetizing their rage via platforms spewing "Hate for Profit."

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[1] Brian Chen, "It's Time for a Digital Detox." *NY Times Online* (Nov. 25, 2020): https://www.nytimes.com/2020/11/25/technology/personaltech/digital-detox.html.

[2] James Bridle, *New Dark Age* (London: Verso Books, 2018), p. 43. Subsequent references to Bridle's book will be in bracketed pages numbers within the main text of the review.

[3] Howard Gardner, *A Synthesizing Mind: A Memoir from the Creator of Multiple Intelligence Theory* (Cambridge: MIT Press, 2020): xiii.

[4] Michael Curry, "Holding on to Hope" (Nov. 1, 2020): https://www.youtube.com/watch?v=G2gnIRQgyV8.

[5] Erich Hörl, "The Technological Condition," *Parrhesia* 22 (2015): 1-22.

[6] Aaron Benanav, "Automation and the Future of Work, Part 2," in *New Left Review* 120 (Nov/Dec 2019): 131.

List of Contributors

Kaylyn Bautista is a Research Associate at the University of Guam. <knaeblek@triton.uog.edu>

Carl Becker is a Professor of Medical Ethics and Policy Science in the School of Medicine at Kyoto University, Japan. <becker.carlbradley.5e@kyoto-u.ac.jp>

Chris Cabrera is a graduate student at Nagoya City University. <rocknrollbuster@hotmail.com>

Debra T. Cabrera is an Assistant Professor of Sociology at the University of Guam. <dcabrera@triton.uog.edu>

Alexandre Coello de la Rosa is a Professor at the Universitat Pompeu Fabra, Barcelona, Spain. <alex.coello@upf.edu>

Paulette Coulter is an independent scholar from Guam. <pmcoulter@gmail.com>

Randizia Crisostomo is a graduate student at the University of Hawai'i at Mānoa. <rbcrisos@hawaii.edu>

Mary Therese Flores Cruz is an Associate Professor of Political Science at the University of Guam. <mtfcruz@triton.uog.edu>

Else Demeulenaere is the Associate Director for Natural Resources at the Center for Island Sustainability at the University of Guam. <else@uog.edu>

Kathleen S. Friday is a Program Manager for Forest Legacy and Forestry Stewardship, Pacific Islands, in the Institute of Pacific Islands Forestry at the USDA Forest Service. <kathleen.friday@usda.gov>

Maria Haws is an Associate Professor of Aquaculture and Director of Pacific Aquaculture and Coastal Resources Center (PACRC) at the University of Hawai'i at Hilo. <haws@hawaii.edu>

Marcel Higgs III is a Research Assistant at the University of Guam. <higgsm@triton.uog.edu>

Sutej Hugu is a Regional Coordinator for East Asia at the Indigenous Community Conserved Areas (ICCA) Consortium.
<sutej.hugu@gmail.com>

Stefanie M. Ickert-Bond is a Professor of Botany in the Department of Biology and Wildlife at the University of Alaska Fairbanks and Curator of the Herbarium at the University of Alaska Museum of the North.
<smickertbond@alaska.edu>

William Jeffery is an Associate Professor of Anthropology at the University of Guam. <jefferyw@triton.uog.edu>

Romina King is an Assistant Professor of Geography at the University of Guam. <roking@triton.uog.edu>

Edward Leon-Guerrero is a Research Assistant at the University of Guam.
<lg.edward.e@gmail.com>

Amy Lauren Lovecraft is a jointly appointed Professor of Political Science and Director of the Center for Arctic Policy Studies at the University of Alaska Fairbanks. <allovecraft@alaska.edu>

Harley Ichiro Manner is an Emeritus Professor of Geography and Micronesian Studies at the University of Guam.
<hi80865inlado@yahoo.com>

N. Kauʻi Baumhofer Merritt is an Assistant Professor of Indigenous Health Sciences at the University of Hawaiʻi – West Oʻahu.
<kaui.baumhofer@gmail.com>

Nawaʻa Napoleon is a Professor of Hawaiian Language and Dean of Arts and Sciences at Kapiʻolani Community College. <nawaa@hawaii.edu>

Sharon Māhealani Rowe is a retired Professor of Philosophy at the University of Hawaiʻi Community Colleges and adjunct lecturer in Philosophy at the University of Hawaiʻi at Mānoa. <srowe@hawaii.edu>

Donald H. Rubinstein is a Professor of Anthropology, Public Health, and Micronesian Studies at the University of Guam. <rubinste@triton.uog.edu>

Lajikit Rufus is the State Forester at the Ministry of Natural Resources and Commerce, Republic of the Marshall Islands. <lrufus@hawaii.edu>

Ha'ani San Nicolas is a graduate student at the University of Hawai‘i at Mānoa. <haanisn@hawaii.edu>

Chris S. Schreiner is a Professor of English at the University of Guam. <cschreiner@triton.uog.edu>

James D. Sellmann is a Professor of Philosophy and Micronesian Studies and Dean of the College of Liberal Arts and Social Sciences at the University of Guam. <jsellmann@triton.uog.edu>

Mary Spencer is a Dean Emerita and retired Professor of Psychology and Micronesian Studies at the University of Guam. <class_uog@yahoo.com>

Dirk H.R. Spennemann is a Professor in the Institute for Land, Water and Society at Charles Sturt University, Australia. <dspennemann@csu.edu.au>

Andrew Soh is a Lecturer at Ateneo de Manila University. <aklsoh@hawaii.edu>

Tarisi Vunidilo is an Assistant Professor of Anthropology at the University of Hawai‘i at Hilo. <Tarisiv@hawaii.edu>

Sveta Yamin-Pasternak is a Term Assistant Professor in the Department of Anthropology and works with the Institute of Northern Engineering at the University of Alaska Fairbanks. <syamin@alaska.edu>

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