

AU COEUR DU TRIANGLE POLYNÉSIEN

*BILAN ET PERSPECTIVES
DE L'ARCHÉOLOGIE POLYNÉSIENNE*

ABSTRACTS



East Polynesian Settlement: The view from the Southeast Solomons.

Peter J. Sheppard

Wilson (1985, 2012, 2021) has proposed settlement of East Polynesia from the Central Northern Outliers located on the eastern margin of the Solomon Islands. In this paper I will review the cultural, genetic and archaeological evidence for such a proposal and the related issue of the settlement of central Micronesia and the development of a marginal east Melanesia-Central Micronesia interaction zone.

The settlement of East Polynesia: A view from historical linguistics

Mary Walworth

Uncovering the early history of East Polynesia has long been a multidisciplinary endeavor, in which historical linguists and archaeologists have provided mutually corroboratory evidence for the timing, direction, and process of East Polynesian settlement and inter-island contact. This talk will review how linguists have viewed the evolution of the Eastern Polynesian languages and will discuss how linguistic theories of East Polynesian history have aligned (or not) with those from archaeology. Furthermore, this talk will highlight areas of current debate within Eastern Polynesian historical linguistics, presenting more recent hypotheses and explaining their implications for the history of East Polynesia. Specifically, this talk will explore the internal relationships of the Eastern Polynesian languages and will introduce new evidence for a revised subgrouping of them. Additionally, this talk will address the position of these languages in the wider Polynesian language family, focusing on their relationships to the Polynesian Outlier languages. Through classic historical linguistic methods and computational linguistic tools, this talk will ultimately demonstrate that the Outliers and Eastern Polynesian languages form separate subgroups from one another, indicating multiple and separate migrations that were initiated in Western Polynesia.

The Paternal Ancestry of Oceania

Adam B. Rohrlach, K. Nägele, J. Krause, M. Stoneking, W. Haak

Ancient DNA (aDNA), especially when studied in the light of oral history, and archaeological, anthropological and linguistic contexts, can be a powerful tool for exploring the history of human populations. aDNA studies have historically focused on mitochondrial DNA and whole genome data. It has been suggested that some important aspects of population histories can be shaped by male-driven events (such as migration, exploration or invasion), and so a paternal perspective of the genetic history of a population through studying the Y chromosome can be highly valuable.

Unfortunately, DNA degradation and contamination in warmer, humid regions, can make recovering human DNA very difficult. Recent advances in “targeted sequencing” have led to efficient, low-cost and minimally invasive methods yielding high-resolution genome coverage. However, what little of the Y chromosome that is targeted by these methods was designed using mostly European genetic diversity, missing diversity from key geographic regions. As a consequence, these technologies are incapable of discovering genetic variation in previously under-studied regions and peoples.

Here we present the Y-Mappable Capture Assay (YMCA), a new method for the entire (mappable) Y chromosome. We show the power of our new method for high-resolution Y chromosome analyses, and describe our study design to apply this method to Oceania, which is home to two major chapters in human history: the expansion of peoples into Sahul ~65 thousand years ago (kya), and the settling of Micronesia, Melanesia and Polynesia from South-east Asia ~5 kya. We aim to explore the paternal history of these regions, spanning the last 65 ky, by applying YMCA to generate the first ever set of deep-sequenced ancient and present-day hunter-gatherer

Y-chromosome sequences. We will explore this data using population genetics, phylogenetics and massive genetic simulations analysed with cutting-edge machine learning algorithms and Approximate Bayesian Computation methodologies.

East Polynesian Settlement from a western Pacific archaeological, genetic and linguistic perspective

Matthew Spriggs

It is clear that discussions on the initial human settlement of Eastern Polynesia have been opened up for the first time in a generation or two by the linguistic work of William 'Pila' Wilson. His hypothesis of a Central-Northern Outlier origin near the Solomon Islands for East Polynesian languages has developed over now more than 15 years and recently received support from the late Bob Blust, the doyen of Austronesian linguists. Or rather the discussions would be opened up if East Polynesian archaeologists had not very largely ignored his work, preferring to stick with at-best seriously challenged linguistic models for the settlement of and spread within East Polynesia that were largely formulated in the mid-1960s. Any argument about the linguistic bases for Wilson's hypothesis is best left to the linguists, but is there any archaeological or genetic evidence directly pertinent to judging the validity or not of his ideas? This paper will evaluate the evidence.

Disentangling the complex history of the Polynesian Outliers

Mary Walworth, A. Hermann, S. Greenhill, R. Gray

In this paper, we use an interdisciplinary approach to unknot the complex history of the Polynesian Outlier expansion and address the following questions: Did the Outlier populations expand westward in one major pulse, or in multiple waves? Where and when did this expansion begin? How do the Polynesian Outlier languages relate to one another? For this investigation, we compiled basic vocabulary data for 54 Central Pacific language varieties into the Austronesian Basic Vocabulary Database and applied the historical comparative method in order to establish cognate sets. We then used Bayesian phylogenetic methods to infer internal relationships among these languages and phylogeographic methods to further determine the paths of their expansion. We also modelled chronometric data from the archaeological record in order to constrain the age of two nodes identified as moments of earliest human settlement in the Pacific islands: the root of the Proto-Central Pacific interstage was calibrated using a compilation of 81 dates from early Lapita sites in Fiji and Western Polynesia, and the root of Proto-Eastern Polynesian was calibrated using a compilation of 64 dates from early cultural contexts in Central Eastern Polynesia.

From these analyses, we identify six major Outlier language groups corresponding to at least six waves of migrations from the Western Polynesia area at different moments in time. This new evidence for the Outlier expansion challenges recently proposed hypotheses of their linguistic affinities, while offering a detailed account of the internal relationships of the Outlier languages and shedding light on the history of the Outlier populations.

Piecing together the settlement of the Pacific with kiore genomics

Catherine Collins, Anna Gosling, Lisa Matisoo-Smith

Understanding the origins of the Lapita people and the complexities of post-settlement interactions has long been of interest. As the Lapita people moved through the Pacific, settling new islands, they carried important plants and animals with them. The kiore (Pacific rat, *Rattus exulans*) is one of these species that was transported across the Pacific. Understanding the movements of kiore can therefore inform us about the movements of the people who carried

them. Early genetic studies focused on a short region of the mitochondrial control region identified the generic Hawaiki or homeland region of the Cook and Society Islands for East Polynesian populations, but could not distinguish the specific source population for the founding kiore populations because most of the East Polynesian samples shared a single mtDNA lineage. Today we can generate complete mitogenomes, which can break up previously identified haplotypes into multiple haplotypes. By sequencing mitogenomes and building a higher resolution genomic dataset for kiore we can better understanding some of the finer-scale interactions in this region.

The Colonization Phase and Early Expansion Phase on Mo'orea: Refining the Society Islands' Cultural Chronology and Understanding Shifts in Material Culture and Subsistence Practices

Jennifer Kahn

Colonization Phase and Early Expansion/Development Phase sites in the Society Islands have been difficult to find and have been poorly studied, resulting in a vague understanding of this archipelagoes' founding cultural complex and its adaptations to specific island environments through time. Discovery and excavation of ScMo-350, a multi-component coastal site in Haumi, Mo'orea, Society Islands, provides robust sample sizes for understanding the timing and function of Colonization Phase coastal settlements and their changing constellation of use through time. In a similar manner, discovery and excavation of ScMo-360 (Ha'apiti, Mo'orea), first settled in the Early Colonization Phase, provides robust data for a Mā'ohi coastal settlement situated in a more marginal leeward context. My discussion of these sites (and others in the archipelago) focuses on three themes: the timing of island colonization on Mo'orea and the larger archipelago through AMS dating of short lived species and application of Bayesian analysis; analysis of sub-surface features and artifacts to understand site function and its change through time; and discussion of faunal remains and fishing gear to infer diachronic shifts in subsistence practices. My broader analysis suggests that Colonization Phase sites in the archipelago are situated to access well-watered terrestrial flatlands and rich marine resources. Artifact and subsurface recovery at ScMo-350 suggests a moderately sized Colonization Phase site which represents permanent settlement largely focused on marine exploitation. In the Early Expansion Phase, artifact and sub-surface feature patterning suggest stone architectural structures related to cooking, other residential activities, and innovative agricultural practices. Early Expansion/Development fishhook assemblages illustrate similarities with Colonization Phase assemblages, but also document a movement towards increased capture of reef fish as well as the the adoption of local styles and locally specific fishing practices.

The chronology of agricultural, environmental, and demographic change in ancient Sāmoa indicates population rise was a proximate origin of the Polynesian chiefdoms.

Ethan E. Cochrane, S. Quintus, M. Prebble, A. Queenin, P. Augustinus and T M. Tautunu

Samoa is the presumed birthplace of the Polynesian chiefdoms. This social-political system arose, in part, through innovations in land tenure or control, and technologies that intensified agricultural production. The timing of these changes in Samoa, or if they happened at all, is, however, debated. This presentation focuses on new data pertinent to land tenure and agriculture in the Falefa Valley, Upolu Island, Sāmoa. Using lidar analysis and pedestrian survey, we have documented an extensive rock-wall field system covering approximately 12 km², and a contiguous wet-land ditch system extending over approximately 4 km². Land-tenure changes are indicated by the construction of large corporate-built rock walls that began after 900 cal BP with smaller walls, possibly a component of intensified agriculture, built several hundred years later. Analysis of both stream profiles and D-section sediments suggests human-induced burning of portions of the valley began after 670 cal BP, roughly contemporaneous with the construction of ditches and forest removal upslope of ditched areas. Analysis of plant macro-

and micro-fossils shows a change in crop plants also at this time, possibly indicating agricultural intensification. The timing of corporate-built stone walls occurs at about the same time as a sharp population rise in Sāmoa and first settlement of Eastern Polynesia, while later agricultural changes in the Falefa Valley, the construction of smaller rock walls, human-induced burning, and changes in crop plants occurs after movements into East Polynesia. We propose that population rise was the proximate trigger for innovations in land-tenure and the formation of chiefdoms in Sāmoa.

Marquesans and their evolving agricultural niche : a view from Nuku Hiva

Melinda S. Allen

The Marquesan Archipelago presented island colonists with considerable environmental challenges: a rugged topography and limited coastal plains, few coral reefs, and a climate regime punctuated by severe droughts. Yet European explorers encountered sizable populations, with impressive architectural traditions, and rich material cultures—supported by productive agricultural economies. Although the origins and development of the latter are of long-standing interest, given the dearth of field structures, Marquesan agronomic systems are at best incompletely known and to some extent archaeologically invisible. Past efforts to understand the temporality of the Marquesan agricultural developments have mainly drawn on indirect evidence—particularly trends in pig husbandry and indicators of population growth. Here I assemble the accumulating palaeoecological, sedimentary, and radiocarbon records (often co-produced with colleagues and students) for Nuku Hiva Island. Integrating these diverse lines of evidence allows for a sketch the island’s agronomic history and illuminates some of the complex eco-evolutionary dynamics that shaped the agricultural niche over time. The Nuku Hiva case both highlights insights from particular kinds of records, and points to knowledge gaps—potentially aiding on-going efforts to build more resolved agronomic histories, here and elsewhere.

Charcoal and Trees in Polynesian archaeology: assessing the application and results of anthracology case-studies across three archipelagos (Society, Gambier and Tuamotu Islands)

Emilie Dotte-Sarout

Over the past 10 years, anthracology, or archaeological wood charcoal analysis, has been applied more systematically than ever before in Eastern Polynesia. With a variety of case-studies providing concrete data on the ancient vegetation and its use by precolonial populations, the time seems ripe to start comparing and assessing the results obtained, but also the modes of application and limits that constrain the development of the discipline in the region. I’d like to use the opportunity of this conference to present an overview of three case-studies I have conducted in collaboration with archaeologists working in the Society, Gambier and Tuamotu islands to reflect on what their comparative analysis tell us about the entangled history of Polynesian people and forests (including gardens), and about the prospects and challenges to continue developing anthracology and archaeobotany more generally in Eastern Polynesia.

Vulnerability and Resilience in Ancient Mangareva

Patrick V. Kirch

This paper will synthesize the results of five seasons of archaeological investigations in the Gambier Islands, carried out from 2001 to 2014, with an emphasis on human ecodynamics in this small Eastern Polynesian archipelago. Excavations at three key sites on Taravai (Onemea dune site), Agakaitai (Nenega-iti rockshelter), and Kamaka (Kitchen Cave) islands provide stratigraphically and chronologically well-controlled sequences spanning the period from

initial Polynesian arrival until early European contact. Analyses of terrestrial and marine faunal remains, of plant macro- and micro-fossil remains, combined with geoarchaeological analysis of sediments and isotopic analysis of rat bones provide a range of evidence on the role of humans in transforming the landscapes of these small islands from initial pristine, forested ecosystems supporting a diverse biota including abundant seabird populations, into highly managed, anthropogenically modified agro-ecosystems. The paper will discuss the implications of these transformations for Mangarevan society and culture as ethnohistorically documented.

Ngā Mātātoka ki Moana Nui a Kiwa: Molecular to macrofossils in Polynesian palaeoecology

Matiu Prebble, E. Cochrane, S. Quintus, N. Porch, T. Lewis, R. Lloren, N. Dubois, J. Brocks, D. Battistel, D. McWethy

Here we present a series of case studies from different palaeoecological contexts in Polynesia examining the role fossil proxies from 'natural' and archaeological deposits might play in shaping our understanding of the origins of Polynesian ecosystems and societies. We examine macrofossil evidence for the pre-human distribution of pili (*Canarium harveyi*), niu (*Cocos nucifera*), and noni (*Morinda citrifolia*) and the associated palaeoecological records. This evidence points to the indigenous status of 'wild type' varieties of these tree crops at least in Central Polynesia. These species occupied soils later targeted for root crop production, particularly taro (*Colocasia esculentum*), but in the case of Sāmoa, it appears that pili never became part of the tree crop roster. Instead, a different assemblage of tree crops came into prominence more characteristic of East Polynesia after 1000 yr BP. We also examine the way molecular fossils (biomarkers) are transforming our understanding of ecological changes associated with initial Polynesian colonisation by comparing archives from Tikopia, 'Upolu, and Rapa Nui. Here we compare standard fossil proxy approaches including pollen and sedimentary charcoal particles, with molecular biomarkers including Polycyclic Aromatic Hydrocarbons and coprostanols, from contiguous lake and swamp sediments spanning Polynesian colonisation, to disentangle the consequences of anthropogenic activity from other perturbations. Many factors have been put forward to explain the contrasting ecological and socio-political states of these islands as observed at European contact. Whereas the growing body of multiproxy evidence is strongly pointing to highly dynamic cultural and ecological responses to changing resource availability and climate since Polynesian arrival. We conclude by emphasising the need to explore a wider range of depositional settings suggesting that programs in wetland archaeology in Polynesia need to be expanded.

Inter-Island Production Variability and Pre-Contact Carrying Capacity Estimates: A Geospatial Analysis of Taro Farming in Rurutu, French Polynesia

Claudia Escue and Jennifer G. Kahn

Our study explores pre-contact taro cultivation in pondfield irrigation systems in Rurutu (Austral Islands, French Polynesia). Understanding the size and extent of these systems is critical for estimating pre-contact human population vis-a-vis carrying capacity, the ability to produce surplus, and socio-political dynamics. Since peak taro cultivation occurred across Polynesia prior to its historic documentation, the extent of wetland cultivation must be estimated from other sources. We explore pre-contact ecology and carrying capacity on Rurutu using Landsat imagery and geospatial suitability analysis to estimate the maximum extent of the island's pondfield irrigation systems. A primary goal was to develop an intra-island comparison of probable annual yields of taro to model pre-contact carrying capacities and their distribution at the district scale. Our model indicates 1) the likely presence of 20 dormant taro systems on Rurutu and 2) significant intra-district differences of taro production on the island in the pre-contact era. We integrate our carrying capacity-based population model with previous house count-based population

estimates to compare intra-island population distributions. Notably, our results suggest that the largest populations resided in Vitaria and Peva, the two districts with the most power as evidenced by oral traditions. As an Open chiefdom, variability between district productivity and carrying capacity likely spurred, in part, the high incidence of warfare noted in ethnohistoric accounts and oral traditions. The contraction of taro fields noted from the modern day to the pre-contact era likely speaks to intentional decisions by Rurutuan communities when faced with labor shortfalls due to introduced diseases and other destructive elements of European contact. Our findings provide preliminary data on pre-contact taro cultivation and establish a base for future research on Rurutuan agricultural systems in the past and present.

A botanist's view on archaeology : phytogeography of Polynesian introduced plants

Jean-François Butaud

Les techniques de paléoécologie sont de plus en plus employées afin de comprendre comment le Pacifique a été peuplé par l'Homme, comment les Océaniens vivaient et quels impacts le peuplement a causé sur le milieu naturel. Pour être efficace, ces techniques nécessitent des outils et bases de données fiables et à jour des connaissances dans les différents domaines comme la zoologie ou la botanique. Nous nous proposons ainsi de mettre à jour la liste des plantes d'introduction polynésienne et leur répartition géographique ancienne dans l'ensemble de la Polynésie orientale.

Nos travaux ont permis d'identifier 75 plantes vasculaires comme pouvant être des introductions polynésiennes dans l'ensemble du triangle polynésien, ces plantes pouvant être divisées en plusieurs catégories en fonction de la certitude de leur statut biogéographique : 51 plantes d'introduction polynésienne certaine, 7 plantes à l'introduction polynésienne plus probable que l'indigénat et 17 autres plantes à l'indigénat plus probable que l'introduction polynésienne. Les introductions volontaires dominent avec 45 espèces pour 30 introductions involontaires possibles. En termes de répartition, on observe une décroissance du nombre d'introductions polynésiennes depuis l'ensemble Société/Cook/Australes Nord, où toutes les espèces sont présentes, vers les Marquises puis vers Hawaii, depuis ce même ensemble vers les Gambier, les Pitcairn et l'Île de Pâques, ou vers la Nouvelle-Zélande. Ces informations indiquent un « flux » de peuplement de la Polynésie orientale plutôt par la Société ou par l'ensemble Société/Cook/Australes Nord, puis des colonisations à partir de cet ensemble vers les Marquises et les extrémités du triangle polynésien.

Ces résultats ne sont pas figés et certains nécessitent d'être interprétés, confirmés ou infirmés à la lumière d'autres disciplines. Nous espérons ainsi donner une vue d'ensemble et proposer des connaissances plus actualisées sur les introductions polynésiennes qui stimuleront la recherche.

Turtles for the Ancestors – a zooarchaeological study of ritual deposits on Fakahina marae, Tuamotu.

Iona Claringbold

Several decades of research on Polynesian faunal remains have refined our understanding of interactions between humans and animals through time based on the study of domestic assemblages. Remains deriving from ritual contexts, however, are scarcely documented. As part of a multidisciplinary research project led by the CIRAP on Fakahina atoll (Tuamotu), the analysis of sea turtle remains from ceremonial *marae* sites offers results from zooarchaeological study targeted specifically at ritually deposited remains.

Assemblages from three *marae* sites were analysed using quantitative and taphonomic methods aimed at detecting ritual behaviours. Fragments were assessed for breakage patterns, weathering, carnivore and butchery marks, and other taphonomic variables which were then compared between site contexts as well as between overall sites.

Skeletal frequency patterns based on MNE counts allowed for the identification of intentional

separation and deposition practices, some previously documented in ethnographic sources. Taphonomic patterns including the combined presence or absence of carnivore and weathering damage could also clarify the role of spatially associated features as either open-air offering platforms or closed structures.

Despite the preliminary nature of this study, our analysis in Fakahina already demonstrates more complexity and diversity in East Polynesian rituals than previously thought, including a case of multi-species deposition at a *marae*. The study opens a gateway to new research and collaborative efforts that can further clarify how East Polynesian ritual behaviours interacted with other dynamic components of ancient life.

Reassessing long-term fishing changes in the Marquesas: new results from the Hane dune site, Ua Huka

Vahine Rurua, E. Conte, P. Béarez

Les sites archéologiques localisés sur le littoral de Hane (île de Ua Huka, archipel des Marquises) sont des références quand il s'agit de documenter l'évolution de la pêche sur le long terme en Polynésie. Depuis les travaux de Sinoto (1964-65) l'analyse des restes zoologiques alors mis au jour met en lumière l'exploitation du milieu marin sur une longue période de temps. Les auteurs successifs ont notamment remarqué une diminution significative des poissons pélagiques au profit des prises côtières lors des périodes récentes. Le dernier résultat influença par la suite les interprétations concernant la division de la pêche entre le territoire côtier et le proche océan. Plusieurs auteurs ont cependant réagi en rappelant que le corpus d'étude de Hane n'était pas suffisamment élevé pour arriver à apprécier la modification des captures dans le temps. En ce sens et par le biais de procédures de fouilles plus fines opérées par le CIRAP en 2009 à Hane, nous avons questionné encore une fois ce potentiel « shift » mis en avant par plusieurs archéologues océanistes. Nous avons étudié les restes de poissons recueillis puis évalué la diversité exploitée par la détermination des taxons et des biomasses ciblées. A partir de 13 000 fragments identifiés (dont 38% à l'espèce) nous montrons que les hommes exploitaient quotidiennement l'ensemble du rivage mais aussi des petits poissons pélagiques se rapprochant de la côte de manière séquentielle et ce dès les premières installations. La baisse des petits pélagiques existe mais est associée à un affaiblissement de l'abondance des restes ichtyologiques en général. Nous suggérons ici que les ichtyofaunes changent en fonction des contextes d'occupation du littoral. Nos données sont en accord avec plusieurs observations archéo-ichtyologiques de la région en faveur d'une adaptation rapide des communautés aux environnements côtiers des îles et du possible maintien de la pêche de proximité dans le temps. La présentation invite finalement à questionner l'avenir de la recherche en Polynésie centre-orientale en termes de méthodologies et d'acquisition des données pour mieux interpréter l'approvisionnement en poissons lors des périodes anciennes.

From analytical methods to fishing methods!

Philippe Béarez and Vahine Rurua

Archaeozoological data from coastal sites are among the best evidence to reconstruct ancient fishing activities and their impacts on past biodiversity. However, in marine ecosystems with high biodiversity, identifying the taxa represented in the assemblages is a real challenge. This is precisely the case in Oceania where, in addition to the classical difficulties linked to the conservation of remains, and the lack of specialists and sufficiently rich reference collections, the specific richness of fish populations is also a challenge.

These constraints have for a long time led to an interest, in this part of the world, focused on only a part of the skeletal elements in order to assign the archaeological remains to a family, a genus or a species, which is the first milestone on the road to knowledge of fishing practices. However, recent studies show the insufficiencies of this method and the interest of taking into account the

whole skeleton and in particular the vertebrae. On the basis of regional examples we will show the advantages and the limits of a new methodology based on rich local reference collections. Finally, we will evoke the perspectives of improvement of archaeo-ichthyological studies by the use of molecular methods.

Beyond Diet: Current and Future Directions for Stable Isotope Analysis in Polynesian Archaeology

Jillian A. Swift

Stable isotope analysis in archaeology is prolific enough that the method can hardly be called "cutting edge" any longer. As with other sub-specializations like zooarchaeology or paleobotany, the field has matured to the point where the non-specialist should feel confident integrating the technique into their standard interpretive toolkit. However, there remains a relative dearth of stable isotope analysis literature within Polynesian archaeological contexts, despite the increasing affordability and accessibility of the technique. This presentation will review the current state of stable isotope analysis in Polynesian archaeology, and evaluate the possibilities and limitations for continued archaeological stable isotope analysis in the Pacific. It will highlight past work on carbon and nitrogen isotope analysis of commensal fauna from Polynesian archaeological sites to demonstrate the promise of C and N isotopic explorations beyond direct dietary reconstruction. Although results should be interpreted cautiously, stable isotopic data offer a promising semi-quantitative method for understanding environmental transformation, and a particularly powerful tool to connect human-ecosystem dynamics in the past with present-day environmental conditions and sustainability concerns.

Not just an empty shell! Six centuries of shellfish exploitation at the Hane dune site, Marquesas Islands

Gabrielle Traversat

Shellfish remains on archaeological sites can provide important information regarding subsistence strategies and potential human impact on marine resources. Aside from its value as a food source, the calcareous shell of these invertebrates was also used as raw material for manufacturing a wide variety of artefacts. Mollusks, although ubiquitous to coastal archaeological sites in the Marquesas Islands, have seldom been analyzed and subsistence studies regarding this type of resource remain limited. We here address the topic of molluscan exploitation in the Hane dune site assemblage. Located at the mouth of the Hane valley, on the southern coast of Ua Huka Island, this site has been the focal point of Marquesan archaeology since the 1960s. This case-study focuses on the assemblage from the 2009 excavation, led by the CIRAP. With a newly established cultural sequence and more reliable radiocarbon dates, the site records six centuries of molluscan exploitation, spanning from the 11th to the end of the 17th century A.D. By using a set of zooarchaeological quantification methods, species-level taxonomic identification, biometry and spatial analysis, we document the exploitation of a wide range of shellfish taxa focused mainly on the intertidal rocky shore, while highlighting major chronological trends. We further discuss a shift from the initial targeting of a large, meaty polyplacophoran or *mama* (*Acanthopleura gemmata*), to the selection of the smaller yet plentiful limpet or *kaapihi* (*Cellana radiata*). Technological production is also recognized at the site, revealing the diversity of shell uses, from tools to ornaments. The quantity of pearlshell artifacts and manufacturing waste, as well as associated tools such as urchin spine files attest to a significant production of fishing gear.

A day in the life of Kuri, the Māori dog in Aotearoa: Insights from Zooarchaeology

Patricia Pillay

As the oldest animal domesticated, dogs have a long-standing symbiotic relationship with humans and an eclectic range of roles in the anthropogenic niche. The Pacific Islands provide another context for understanding this ongoing evolutionary relationship, due the absence of other domesticated animals and oceanic transportation in contrast to mainland migration. Our research considers dog-human symbioses from when Polynesians voyaged from the environmentally circumscribed tropical islands of central Polynesia (where interspecific competition could be intense), to the largest, most ecologically diverse landmasses in Polynesia—the islands of Aotearoa New Zealand. The pattern of arrival, followed by local extinction, suggests Polynesian dogs occasionally competed with their owners for food or in other ways, and perhaps were intentionally removed, but Aotearoa New Zealand presented all together novel opportunities. We suggest dogs and their human companions underwent competitive release as they quickly dispersed the length of the country and offshore islands. These relationships are examined using dog distribution and abundance, as well as through dental proxies of diet and health (tooth wear, periodontal disease, caries, calculus, and enamel hypoplasia). Overall, the potential of acquired dental attributes to inform on variation in dog health, diet, and symbioses with their human managers is demonstrated.

The Role of Marine vs. Terrestrial Diet Inputs on Four Polynesian Islands

Cedric Puleston, J. Kahn, N. Belluzzo, O. Chadwick, P. V. Kirch

Although the first voyagers who explored the Pacific brought many of their essential foods with them, the lands they encountered varied considerably, offering both food-acquisition challenges and opportunities. Here we consider the human-ecological interactions on four Polynesian islands, representing a gradient. Mo`orea and Maupiti (Society Islands, French Polynesia) are younger high volcanic islands. Mo`orea has a moderate fringing reef and Maupiti is a small coral atoll that retains its volcanic central island. Mangareva and Taravai (Gambier Islands, French Polynesia) are older islands who share a large enclosing lagoon. We are interested in the population consequences, and related social features, of a food production system that relies on terrestrial agriculture versus one that relies more heavily on marine resources. To accomplish this we characterized the agricultural potential of each of the islands based on an careful study of geographical features and assigned all the arable land into one of six zones based on its most likely agricultural use. We estimated production based on available studies of yield in the Pacific. For the marine contributions we used fishing studies to estimate the productivity of reef-associated area. To account for the range of fishing success rates across these studies we bracketed these values to represent the extremes and included two intermediate values for comparison. We used data from excavations on the study islands to examine the relative contributions of the various marine fauna and also terrestrial fauna, including pig, dog, birds and other species. We found that among the most likely reef productivity scenarios Mo`orea's and Maupiti's potential food resources come overwhelmingly from terrestrial sources, while even on Mangareva and Taravai the land has a much greater potential to provide calories than their rich and extensive lagoon. On the lagoon-enclosed islands the land may have provided two-thirds or more of the available calories.

How the Chicken Crossed the Pacific

Anna Gosling, Catherine Collins, Lisa Matisoo-Smith

Lapita peoples transported several animal species in their colonizing canoes as they settled the islands of the Pacific. Chickens (*Gallus gallus*) were among the domesticated animals introduced by Lapita peoples. Later, Polynesians also transported chickens as they settled many of the

islands of the Polynesian Triangle. The discovery of pre-Columbian archaeological chicken bones recovered from the site of El Arenal, on the south-central coast of Chile, has been the topic of significant debate. Ancient DNA and isotope data indicate that these remains were likely introduced by Polynesian voyagers, thus providing clear evidence of pre-Columbian Polynesian contact with South America. However, it has been suggested that the DNA sequences obtained may have been the result of modern chicken DNA contamination in laboratory reagents. Here we present complete mitogenome data from archaeological sites throughout the Pacific, providing valuable insights into movements of people and their chickens during the settlement of these islands, and show that contamination is an improbable source for the contentious El Arenal chicken data.

Artefact geochemistry demonstrates long-distance voyaging in the Polynesian Outliers

Aymeric Hermann, P. Gutiérrez, C. Chauvel, R. Maury, C. Liorzou, E. Willie, I. Philip, S. Bedford, R. Forkel

As the last great cycle of human expansion in history, the peopling of Remote Oceania is well-documented as a general process of eastward migrations that led to the Polynesian expansion towards the more distant islands of Hawai'i, Rapa Nui (Easter Island) and Aotearoa (New Zealand) thanks to the development of advanced sailing technology and navigational methods. Across the western Pacific and outside of the Polynesian triangle, a set of about twenty societies – collectively known as the Polynesian Outliers – stand out for their distinctive Polynesian languages and socio-cultural organisations, which indicates a different large-scale migratory pattern and long-distance inter-archipelago contacts that remain to be investigated. Here, we present a large-scale geochemical sourcing study of stone artefacts excavated from archaeological sites in central Vanuatu, the Solomon Islands and the Caroline Islands in order to highlight patterns of inter-island mobility throughout the Polynesian Outliers. Geochemical sourcing requires reliable and comparable reference data covering all possible source areas. This presentation will show how such large scale datasets can be accessed and mobilised in order to facilitate reuse of existing data, enable reproducibility, and therefore advance future provenance studies in the Pacific. Based on our comparative geochemical analyses, we provide unambiguous evidence of multiple long-distance voyages in the western Pacific during the last millennium A.D., with exotic stone materials being transported up to 2500 km from their source. Our results offer new insights on the scale and timing of contacts between Polynesian Outlier communities and both western Pacific and western Polynesian societies.

Non-destructive geochemical characterisation of non-volcanic adze stone in Oceania: An example from New Zealand

Andrew McAlister, B. Kneebone, D. Bonica, G. Gedson

Geochemical characterisation of stone artefacts is well-established in Oceania. This technique has provided a key means of identifying spatial distributions of raw materials and, by extension, social interaction, especially in regions where metal and ceramics were lacking. Artefact characterisation studies in Oceania have concentrated mainly on volcanic rock types, in particular basalts and obsidians. However, in regions with a continental geology, such as Australia, New Zealand and Papua New Guinea, sedimentary and metamorphic rocks were also important sources of tool stone.

In terms of characterisation techniques, destructive or partially-destructive methods have traditionally been preferred because they produce the most accurate geochemical data. However, in many jurisdictions, the use of these methods is becoming more restricted as indigenous peoples gain greater control over the curation of their heritage. Accordingly, research is focussing more towards non-destructive methods.

In this paper we investigate greywacke, a fine-grained sedimentary rock that was commonly

used for adze manufacture in New Zealand. Greywacke exposures occur throughout New Zealand but, to date, few quarry sites have been identified, with the Motutapu Island source, in the Hauraki Gulf of the Auckland region being the only one studied in any detail. Consequently, greywacke adzes are often attributed to this source without considering other possibilities. For this study, we collected adze-quality greywacke from several other locations in the Auckland region, and here we discuss the possibilities and limitations of non-destructive geochemical analysis of this material.

Beyond XRF: Vibrational spectroscopy for Polynesian archaeologists

Elizabeth A. Carter and James L. Flexner

Portable x-ray fluorescence (pXRF) has become a nearly ubiquitous technology in Pacific archaeology, providing a powerful, non-destructive method for chemical characterisation of artefacts. Most commonly the technique is used in provenancing studies of stone tools but there are other applications as well. Other portable and non-destructive instrumentation is much less commonly used, despite having great potential to augment the study of Polynesia's past. This presentation provides examples of two such technologies: Raman and infrared (IR) spectroscopy. Specifically, we provide examples of the kinds of materials and questions that can be explored with these techniques. For faunal remains including bone and shell, Raman and IR spectroscopy can provide evidence of thermal transformation, offering insights into cooking techniques or burnt offerings. They can assist in the identification of botanical remains and pigments. Raman and IR spectroscopy can also provide complementary datasets to pXRF when examining materials such as stone and pottery. The portability of the instruments and the non-destructive nature of the techniques highlight the possibilities that could be explored by using spectroscopic instrumentation in enhancing knowledge about Polynesia's past through archaeological materials.

Archaeological approaches for understanding the Marquesan stone pounder ke'a tuki popoi

Michelle Richards

Marquesan stone pounders known as *ke'a tuki popoi*, *ke'a tu'i kioe* or *k'ea tuki kóna*, were and are still used on certain Polynesian Islands to mash food, usually fruit, especially breadfruit, to make a paste known as *poi*, and some were used to produce medicine and pigments. They were the second most frequently collected stone objects in Polynesia after adzes in the historical period and are numerous in Western museum collections. Yet, pounders have not received as much archaeological attention. Stone pounders provide a way of studying the historical period and the impacts of colonialism on the production and circulation of traditional Polynesian objects by comparing them with adzes from earlier and more recent (pre- to early colonial) periods. This study combines an *object itineraries* and portable x-ray fluorescence (pXRF) geochemical study to an assemblage of Marquesan pounders in museum collections to (1) identify stylistic change through time (2) identify volcanic rock type and match geological sources used to make these artefacts and, (3) consider the impacts of Western colonialism on Marquesan cultural practices. The results of these analyses identified that the distinct Tiki-headed *ke'a tuki popoi* were produced from a localised region in the Marquesas and that pounders were not produced from the same basalt quarries as adzes. The patterns of stone pounder production and distribution identified in this geochemical study contrast somewhat with the historical accounts from the 19th and 20th centuries and therefore provide a new perspective into Marquesan stone carving practices just prior to and during the early Western colonial period.

Earthenware in the « Distant Islands »: Analysis of « Colonial-Era » Material Culture from Fakahina, Eastern Tuamotus.

Louis Lagarde, Emilie Nolet, Guillaume Molle

In the context of a pluridisciplinary research program conducted by the CIRAP in the Tuamotu archipelago, we undertook the detailed inventory of the abandoned Catholic mission and surrounding Pa'umotu village of Hokikakika, Fakahina island, along with a study of construction materials, spatial organization and architectural strategies (Lagarde, Nolet, Molle 2020)⁴. We further collected and recorded a considerable amount of archaeological material, all imported and dating to the late 19th century.

The analysis of this material, in conjunction with the historical and ethnographical data, provides a better understanding of daily life in the Tuamotu archipelago during missionary times, at a period of a once-booming coprah economy. The particularity of Fakahina, an island where pearl (and pearlshell) harvesting was never a part of local wealth and where, in scrupulous accordance to the will of Catholic missionaries, coprah remained the main economical resource, allows for comparison with the rest of the Tuamotu. The testimonies from present-day Fakahina prove deeply nostalgic and represent the village of Hokikakika with its stone houses and furnishings as a bygone and somewhat « golden » era. These memories can be compared to the archaeological findings, which reveal the prevalence of French-made earthenware, glasses, perfume and liquor bottles, as well as other kinds of material. This accounts for the growing influence of French colonial power at the dawn of the *Établissements français de l'Océanie* and the existence of a trading post economy. The presence of objects of American and Asian origins also suggests alternate supply routes were also available for the populations of Polynesia, and demonstrates the dynamism of local commercial companies. Useful comparisons can be made with other areas under French influence, like New Caledonia for instance, where similar studies on « colonial-era » material culture have recently been undertaken.

Historical archaeology: A “missing link” in a decolonising Polynesia?

James L. Flexner

The rhetoric of decolonisation is increasingly deployed in contemporary archaeology. There are several risks involved with taking on such a terminology. “Decolonising” can become an empty or shallow way for archaeologists to signal a certain political orientation, without investing in the serious and complex work of inquiring into, understanding, and prioritising the needs and desires of Indigenous communities. The use of decolonisation rhetoric also often assumes a singular and simple outcome where archaeology is (somehow) “decolonised” when it proceeds in a certain way. In reality decolonial politics is hotly contested and debated among a variety of intellectual and political actors living in and outside of colonised spaces. In such a complex situation, what can archaeology really offer to decolonising movements in regions such as Polynesia? I propose a role for historical archaeology as a potential field of knowledge production in decolonisation debates and discussions, while acknowledging this is a limited and still developing approach to the field. A credible process will need the theory and methodology of community-led research, itself an emerging and evolving concept. Since it is impossible, and for many people, undesirable to return to a “pure” precolonial society, many of the debates around decolonisation ask what kinds of futures decolonising movements can produce. Historical archaeology can play a role in providing a sense of trajectory through the colonial past, and into present and future. It is a methodology for documenting the ways that landscapes and material culture transformed alongside new forms of social order, leading to present arrangements that can be transformed themselves. For Polynesian people today, documenting the ruins of a colonial past can offer new ways of addressing some of the tensions and contradictions of the present while imagining what forms the future could take in Oceania's Sea of Islands.

The forgotten names. Rapanui people doing archaeological fieldwork 1914-1960. Identification of indigenous Rapanui in old photographs from archaeological expeditions.

Cristian Moreno Pakarati

The people of Rapa Nui were largely considered, as much as the island itself and its archaeology, objects of study by foreign researchers in the 19th and 20th centuries. Dozens of photographs with Rapanui people on them were published in early books and articles with generic captions of those times like: “a native”, “pure-blooded Rapanui woman”, “kanaka children” or “group of easter islanders”. However, many of these unidentified people were giving valuable insights and contextual information when not detailed interpretations of the archaeological findings that would later be written and published by foreign expedition members, crediting at most some local “informant”. At a time in which the Rapanui were becoming increasingly aware of the importance their culture had to researchers from all over the world, their participation in these field works was a way of getting their traditions, knowledge and ideas “out there”, using expedition members and writers as proxies. Using cross-referencing, field notes, genealogical records, censuses and careful detailed analysis of two thousand old photographs, it is now possible to identify most of these islanders. These Rapanui are recognized figures genealogically connected to the current generations who are always eager to see their past relatives collaborating with renowned expeditions, helping unveil and preserve the history of their homeland.

Gendered Publishing Patterns and Occupational Trends, Oceania Archaeology 2005-2020

Caroline Donovan and J. Kahn

My research examines ongoing issues of gender disparity in male-dominated academic professions like archaeology. Here, I investigate the link between gender and publishing of archaeological research in Oceania amongst a broad cross-section of archaeologists: those working in academia, museums, the private sector and CRM, those working in federal agencies, tribes, and research institutes, and those working independently. Similar research conducted on North American archaeologists has found significant gender imbalances between female and male publishing rates. To determine if similar trends exist amongst archaeologists working in Oceania, I created a database to log the number of female-first authored and male-first authored research articles in both regional and international journals. I also recorded the occupational affiliation of the first authors to compare gendered publishing rates and job type. To launch my study of gender disparities in Pacific Island archaeology, I collected sixteen years of data (2005-2020) for seven peer-reviewed regional journals and eight peer-reviewed international journals. I chose to log information from both regional and international journals to determine if more women publish in regional journals in comparison to international journals and how this might be related to job type or to potential roadblocks in terms of female advancement in the discipline. My regional data results demonstrate that male archaeologists in Oceania publish at higher rates than female archaeologists (70% to 30%). My international data results also demonstrate that male archaeologists in Oceania publish at higher rates than female archaeologists (68.02% to 31.98%). My future study will begin to investigate possible causes of these gender disparities including gender of the journal editors, female preference for non-academic jobs that do not require publications for advancement (as with CRM), instances of gender exclusion and harassment at research field sites, or limited undergraduate mentorship opportunities for prospective female archaeologists.

Hidden in plain sight. The Pacific Matilda project and women in the history of Pacific Archaeology: Polynesian examples

Emilie Dotte-Sarout

The critical history of Pacific archaeology is a new and necessary endeavour, for our discipline to mature and our approach of the field to be self-reflective. Polynesian archaeology has not been different to other regional archaeologies of the world, where images we have constructed of our past are mainly populated by figures of solitary masculine adventurers traveling to the islands, rather than any woman with a trowel in hand (or, as a matter of fact, Indigenous collaborators actively contributing to the research). This means that the current historiography effort has a responsibility to document the hidden figures who actually worked by the side of our well-known “founding fathers”, but were typically masked by the “Halo Effect” well documented in the history of science. In this talk, I will present the Pacific Matilda project, which focuses on the specific case of women in the history of Pacific archaeology, to tell their stories, understand the barriers they faced to enter the field and/or to see their legacies properly recognised. I will then present specific examples of women who participated in the development of Polynesian archaeology and why we should remember and learn about their contributions to our discipline.

Refining the Chronology of a World Heritage site : Preliminary Results from the recent Taputapuātea Archaeological Program

Louis Lagarde, Anatauarii Leal-Tamarii, Vincent Marolleau

Since 2019, a new research program under the supervision of the Direction de la Culture et du Patrimoine (DCP) of French Polynesia and CIRAP, led to two archaeological excavations (2019 and 2021) on the UNESCO World Heritage site of Taputapuātea i ‘Ōpōa, Ra’iātea, Leeward islands. The Taputapuātea complex comprises six *marae* of varying proportions, along with many other visible archaeological features, such as *paepae* and archery platforms, cists, isolated sacred stones and, more broadly, a larger spiritual domain linking the foresty plains of the interior of southeastern Ra’iātea to the outer sea by the Te Ava Moa pass in the lagoon. The main goal of this program was to gain a better understanding of the site’s chronology, specifically the area at the heart of the temple complex, to eventually reconstruct the timeline of edification/use/extension phases of the various religious structures.

So far, two of the six *marae* have been partially excavated: the small *marae* Turi and the larger *marae* ‘Opu Teina, with different methods and approaches. A georadar survey of the site in 2020 revealed several anomalies beneath the ground of the complex, some within the proximity of larger religious structures. Some of these anomalies were excavated during the 2021 fieldwork season, and have yielded important new results.

As we intend to demonstrate through the presentation of our preliminary results, this new excavation program has proven the site’s important chronological depth, showing a use and intensification of practices and constructions from the mid-13th century AD up to the early 19th century. Furthermore, our results clearly indicate that besides the larger, easily identifiable structures, lie many more remains to be analyzed, in order to gain a better understanding of one of Polynesia’s largest and most sacred ceremonial sites.

Kū ka mana o Manawai: The Rise of Traditional Indigenous Governance on Moloka’i, Hawai’i

Pūlama Lima

This paper describes preliminary results of recent research and fieldwork at four heiau (monumental places of worship) within the ahupua‘a (smaller land-division) of Manawai on the island of Moloka’i, Hawai’i. The purpose of these investigations is to better understand processes of societal development and complexity in ancient Hawai’i by analyzing the materialization

and sociopolitical evolution of indigenous religious-governance structures. While the evolution of complex sociopolitical systems in Hawai'i has engaged scholars for nearly two centuries, proximate causation research conducted on this subject has focused mainly on the societal development of later settlers to Hawai'i, with an emphasis on Kaula'i, O'ahu, Maui, and Hawai'i ali'i (elites). Very little research has been conducted with respect to traditional governance structures of smaller islands, particularly Moloka'i, nor has there been research conducted that emphasizes sociopolitical development from the lepo pōpolo (commoner) and kaukau ali'i (lesser ali'i) perspectives. As Native Hawaiians work toward self-governance, not only is it important to recognize the history and mo'olelo of governance in Hawai'i but it is just as important, if not more, to learn from the minutiae of traditional governance structures. This paper seeks to shed light on specific traditional strategies of social control and sustainable governance paradigms in ancient Hawai'i, while informing us about the relationships between religious and ideological transformation as they relate to societal development.

Space, Place, and Landscape: using geospatial tools to understand the formation of elite-ritual secondary centers in the 'Opunohu Valley

Caroline Watson

The materialization of religious ideology and sociopolitical transformation in the pre-contact 'Opunohu Valley had visible impacts on stone monumental architecture and its elaboration across the late 14th to mid 18th centuries. In the interior valley, political and religious transformations led to a rise in competition among junior elites, a process that played out across the cultural landscape through material elaborations to architecture and notably, the centralization and formation of elite secondary centers. 'Opunohu Valley inland secondary centers are composed of an aggregate of *marae* in association with shrines, specialized houses, and other forms of specialized architecture like archery platforms. In this paper, I employ original geospatial analyses to understand the organized formation of five inland secondary centers, and I connect their stone monumental sites to cosmological principles, physical landscape features, and an elite status identity. At the site-specific scale, I evaluate *marae* sites on the extent to which they share similar material elaborations, orientations to landscape features, visibility affordances, elevations, and aspects. At the broader inter-secondary center level, I examine site-type frequencies, densities, and overall site clustering patterns. My multi-scalar approach helps uncover the broad social and cosmological principles that explain architectural variation, *marae* elaboration, and settlement trends across inland secondary centers. Yet, it also exposes that emergent elites forged their own unique social identity and ritual authority at the secondary center level, through localized decision-making processes that drove *marae* orientation, location, and architectural elaboration. Ultimately, I characterize inland secondary centers of the 'Opunohu Valley as areas of both tradition and innovation, expanding upon the narrative of monumentality in these lesser-understood interior zones.

Tahiti iti : Archaeological history of chiefdoms in the Tahiti iti peninsula

Vincent Marolleau

The chiefdoms of the Tahitian peninsula had a major influence on the regional socio-political dynamics prior to the European contact. These communities initially organized in independent 'ati distributed along the shores and numerous valleys of Tahiti iti, progressively aggregated through political alliances and conquests, to form the Teva-i-Tai confederation. Its political, religious and military power allowed them to dominate the whole island of Tahiti and beyond (island of Me'etia, Tuamotu archipelago).

Our doctoral research aims at documenting the long-term distribution of these social groups on the territory of Tahiti iti and to understand their unique trajectories. To do so, we are looking more specifically into settlement patterns, and local specificities of *marae* architecture. We will

first review previous archaeological work carried out since the beginning of the 20th century, including surveys by K.P. Emory, J. Garanger and others. We will then introduce the preliminary results of our recent fieldwork (surveys and excavations) conducted in the Vaitepiha valley in Tautira, our case study. These data, currently being analyzed, will be discussed from a regional (Society archipelago) and macro-regional (Central-East Polynesia) perspective, thus informing the emergence and complex evolution of Polynesian chiefdoms.

Temoe atoll, a satellite-island in the Gambier: archaeological and bioanthropological research

Guillaume Molle, Eric Conte, P. Murail, A. Hermann and V. Rurua

The atoll of Temoe, lying about 40 km south-east of the Gambier, was deserted in 1838 during the catholic evangelisation of the archipelago. Uninhabited since then, the atoll offers an exceptional landscape including numerous well-preserved structures made of coral. First surveys by a team of the Bishop Museum attested to a great archaeological potential that motivated a multiyear research program beginning in 2001. In this paper, we propose a first synthesis of our six field seasons. We describe the variety of ancient structures including *marae*, house pavements, trails and more than 400 coral cairns. Excavations showed that many of them served as burials and allowed for the reconstruction of different funerary practices. Radiocarbon dates indicate a human use of the atoll spanning several centuries; however, the permanent vs temporary nature of the occupation can be examined with regards to its 'ritualization'. While some questions remain, the emerging picture is that of a satellite-island once integrated in a sub-regional network centred around the Gambier. The unique archaeological landscape of Temoe further provides us with the opportunity to understand the ancient beliefs of the Mangarevans whose traditional lifeways completely transformed in the mid-19th century.

Archaeology and toponyms in the Society Islands

Hinanui Cauchois and Eliane Tevahitua

This presentation shows the interactions between archeology, oral traditions and toponyms through comparative examples in the Society Islands, especially Mo'orea, Raiatea and Huahine. We use recent archaeological data and in-depth analysis of their related toponyms to highlight the function or a particular aspect of their history. This approach, though already successfully used in Polynesian archaeology, would benefit from a more systematic use throughout the region. We present here a few examples of how toponyms and oral traditions contribute to a better understanding of pre-Contact landscapes and their histories, as well as their potential boundaries.

Mobilizing Archaeology: Proposing a Model for Digitizing Marquesan Heritage

Emily C. Donaldson

Indigenous heritage is often fraught with ambiguity, marked by colonial trauma and oppression as well as unique knowledge and beliefs that are essential to Indigenous culture. In the Marquesas Islands, local leaders have long worked to preserve and transmit local culture, yet many Marquesans remain disinterested in their heritage (itself an unfamiliar word) and wary of foreign archaeologists and island museums that seem to cater to tourists. Still, Islanders continue to perpetuate spiritual beliefs and practices relating to heritage through their everyday lives. *Manalogue* will be an online platform where Marquesans can discuss and contribute to a dynamic blend of foreign and Indigenous knowledge about local heritage, archaeology and oral history. It aims to address the kind of power imbalances explored by Michel Foucault, in which asymmetries skew the production and circulation of knowledge; a particularly acute

problem when it comes to Indigenous communities. *Manalogue* will apply this theory by inviting discussion from Marquesan contributors and presenting scientific and Indigenous knowledges on an equal footing. Its multi-lingual name reflects its commitment to a diversity of voices and ontologies, united by a single goal: to recognize, celebrate and sustain Marquesan material and immaterial heritage.

The production of obsidian pupils for moai eyes: New geochemical sourcing data on legacy artifact collections on Rapa Nui (Easter Island)

Mara A. Mulrooney and M. D. McCoy

Rapa Nui's only anthropological museum, The Museo Antropológico Padre Sebastián Englert, cares for extensive legacy collections of obsidian artifacts. Since its founding in 1973, the museum has served as the island's only repository for archaeological collections, and its holdings include tens of thousands of all types of artifacts and samples from hundreds of research projects carried out on the island. Among these are obsidian artifacts from domestic contexts as well as distinctive flaked obsidian pieces created to be the pupil set inside the inlaid coral eyes of moai (statues). Although some of these legacy collections lack secure provenience, they still hold much value for research using modern techniques. Here, we describe our analysis of selected legacy collections of obsidian artifacts using portable x-ray fluorescence. Utilizing portable, non-destructive technology, we were able to examine island-based museum collections to investigate obsidian procurement and production without the need to transport artifacts from the island for analysis. We discuss our findings relative to other recent research on obsidian technology on Rapa Nui.

Sacred trees and their contribution to vegetation change, architectural monumentality, and the question of inbuilt age

Annette Kühlem, K-U. Heussner and C. Hartl-Reiter

Sacred trees are a well-known phenomenon in Eastern Polynesia and beyond. They are associated with religious architecture and often serve as taboo markers or for funerary purposes. They are also a factor in the anthropogenic vegetation changes that altered the flora of the islands significantly. So far this was most often only attributed to arboriculture, where useful trees were planted and cultivated for various functions in daily life. During our two surveys campaigns on Nuku Hiva and Hiva Oa we realized that the sacred trees that were planted on and around ritual sites contribute greatly to the overall aspect of monumentality. The typically low stone architecture is not visible from afar, whereas the trees are. As such, they serve not only as territorial but also as taboo markers. Some of these ancient trees still grow on the sites. Understanding their role in the architectural layout of the sites was one objective of our mapping campaigns on the islands. A number of repetitive patterns were identified. An important aspect of our research was to get absolute dates for the still-growing trees on ritual sites. The original purpose was to determine a possible contemporaneity with the archaeological remains. For this we used dendrochronological methods as well as ¹⁴C-dating. The results show that the life-spans of many tree species exceed the so-far accepted maximum ages. These new tree ages contribute significantly to the discussions about inbuilt age of wood from Polynesian islands.

Archaeology in French Polynesia : current and future directions

Anatauarii Léal-Tamarii

En Polynésie française, l'archéologie s'est écrite en plusieurs chapitres et selon une chronologie inhérente à l'histoire institutionnelle du Pays. Avec la création en juin 1979 du Département Archéologie au sein du Musée de Tahiti et des îles, l'archéologie comme discipline scientifique s'inscrit pour la première fois dans une politique publique locale. Marquée par une évolution

statutaire constante, sa pratique est aujourd'hui encadrée par la Direction de la culture et du patrimoine (DCP), service administratif chargé de mettre en œuvre les grandes orientations du gouvernement en matière de patrimoine culturel.

Qu'elle soit « préventive » ou « programmée », l'archéologie polynésienne aborde aujourd'hui de nouveaux défis. Face à l'urbanisation galopante de nos rivages, l'adoption du livre V du code du patrimoine, relatif à l'archéologie, apparaît comme une urgence. Cette réglementation est d'autant plus importante qu'à une époque où les modes et les usages se font et se défont, la recherche d'une identité culturelle est prétexte à l'instrumentalisation de certains vestiges archéologiques. En parallèle de ce besoin de réglementation, l'élaboration d'une programmation de la recherche archéologique à l'échelle du territoire, établi selon des axes-clefs, permettrait aux acteurs locaux de faire face aux enjeux scientifiques et de répondre au besoin de préservation des vestiges.

Ainsi, de part ses programmes de recherche (Taputapuātea), ses opérations de valorisation (modélisation 3D des sites classés de la Polynésie française), ses publications (les dossiers d'archéologie polynésienne), la Direction de la culture et du patrimoine entend participer à la définition des futures grandes lignes de la recherche dans l'optique de l'accompagner et l'aider à anticiper les enjeux à venir.

From excavation to contemplation: thoughts on the musealisation of archaeological finds in French Polynesia

Tamara Maric and Marine Vallée

Looking at archaeological material comprised in collections of Musée de Tahiti et des Îles – Te Fare Manaha, this paper will explore objects trajectories and curatorial practices associated with their 'musealisation'. A retrospective account of their constitution, decision makers and agendas at stake will be tackled. This paper will also consider statutes changes, conditioning, display and discourses conveyed by and around formerly excavated objects throughout the life of the local museum – from Musée de Papeete to the current renovated permanent exhibition. The focus will then lie on the contribution of archaeological studies to collections' knowledge, as well as the museum's role in its diffusion to broader audiences.

This will be put in perspective with other museum collections, within the local museum, as well as on the international scene. The future of such collections within the larger local institutional framework will also be tackled.

Bone, people and diseases in pre-european Marquesas islands

Frédérique Valentin and Anatauarii Léal-Tamarii

The study of the bones, skulls and postcranial skeletal bones, from Hane Dune in Ua Huka, Marquesas Islands, is particularly significant because the hypotheses formulated, if they are verified, will provide a renewed perspective on the health status of the populations inhabiting the archipelago in pre-European times. Observations made on the teeth and alveolar bone, the supporting tissue of the teeth, of individuals uncovered in 1984 by Emmanuel Vigneron (1985) following cyclonic events, will be used here to discuss several possible causes explaining the loss of anterior teeth, incisors and canines, ranging from trauma to infectious disease. Comparisons with other sites, notably those discovered on the neighboring island of Nuku Hiva, will be proposed to shed light on the local variability of epidemiological situations.

A transdisciplinary approach to past fertility in the Pacific Islands: A Marquesan case-study

Clare McFadden and G. Molle

The past population dynamics of Pacific Island communities has been an area of substantial interest, especially since the workshop organized by Kirch and Rallu on Mo'orea in 2003. The evolution of islander communities after initial settlement, including the ecological catastrophe narrative for Rapa Nui and carrying capacity limits for Pacific islands more broadly, the impacts of natural disasters and climatic activities, population pressure and warfare, and the scale of European depopulation, are just a few of the major palaeodemographic questions that have and continue to be pursued in the Pacific region and in Eastern Polynesia in particular.

In this paper we outline a new proposed approach to investigating past population dynamics, using the Marquesas Islands as a case study. The proposed approach aims to provide a deeper understanding and more accurate representation of the complex interplay of causal and consequential factors involved in demographic processes, creating more nuanced, localised population narratives. To do so we seek to incorporate as many biological, sociocultural and environmental variables as possible into the development of a relational model, drawing on archaeological, ethnographic, historical and modern epidemiological and demographic data. While resource intensive, such an approach provides a more holistic, synergistic analysis and bears potential for further sub-regional applications.

A genomic project to study Polynesians from past to present

Cosimo Posth and Etienne Patin

Polynesia, a group of over one thousand islands spread over the Pacific Ocean, was settled during the first great human migration into the open ocean, from 3,300 to 700 before present (BP). Polynesian seafarers are thought to descend from the Austronesian peoples, who originated from seaborne migrations starting in East Asia over 4,000 BP. However, the origins of present-day Polynesians remain highly debated, as their genetic ancestry derives from multiple sources related to East Asian, Papuan, European and Native American populations. Furthermore, there is a consensus that the settlements of West and East Polynesia were separated by almost two thousand years, but the cause of this long pause is currently unknown. Finally, the timing of when each Polynesian island was settled is still unverified. Our project aims to uncover the diverse origins of Polynesian peoples and reconstruct the history of the settlement of Pacific islands, using population genomics. To do so, we propose to sequence the genomes of a large number of ancient and present-day Polynesians in close collaboration with local institutions and researchers. By combining expertise in archaeogenetics and population genetic inference from modern genomes, we plan to assess key aspects of the peopling history of the Pacific, including the size of the populations that settled Polynesia, the timing of their geographic separation and their genetic relatedness to other worldwide populations. The envisioned genomic data, once integrated with evidence from Archeology, Anthropology and Linguistics, are expected to shed new light onto the human history of Polynesia.

Utilizing ancient oral microbes to track human migrations across the Pacific Islands: Insights from Palau and beyond

Laura Weyrich, R. Eisenhofer, G. Molle, B. Llamas, A. Anderson, S. Duchene, A. Porter, K. Dobney, S. Fitzpatrick, A. Cooper, and E. Conte

Ancient human migrations underpin the origin of past cultures, health, ecological interactions, and identity. However, recent or rapid migrations and their effects on human physiology as people adapt to new environments are classically difficult to track using human genetics. A new method – assessing microbial genome evolution over time within calcified dental plaque

(calculus) – provides a unique solution to these problems. Here, we sequenced ancient DNA preserved within dental calculus from three different Pacific Island Nations (Palau, Tahiti, and New Zealand) in concert with local collaborators and communities. We observe significant shifts in the composition of oral microbial communities linked to different Pacific environments, including distinct islands in Tahiti. We also apply a phylogenomic approach to reconstruct the evolutionary history of 10 different vertically-inherited oral microbes preserved across all individuals to further explore past relationships between people in the Pacific. In specific, a key oral species within the Anaerolineaceae family corroborates resolution provided by past human ancient DNA studies and sheds new light on past movements across the Pacific Islands, which could be used to establish a less invasive method for repatriation. Overall, this study highlights how ancient human-associated microbes can provide new insights into past movements and their subsequent effects on human physiology and culture.

Maui's Ark – the past, present and future of commensal approaches in Pacific prehistory.

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It has been more than 25 years since the commensal model for tracking Pacific population mobility was first developed and applied to *Rattus exulans* in Polynesia. We have now increased the number of plant and animal species to which the model has been applied and have extended the approach across the Pacific and Island Southeast Asia. When comparing all of the data regarding the genetic relationships of the various species, some interesting patterns are emerging. These genetic patterns tell us not only about population origins and interactions but help us understand animal human relationships and gain insights into the economic strategies of Pacific peoples in the past. Now, as advances in molecular technologies are providing new opportunities for generating significantly more genomic data, it is time to highlight some broad questions regarding Pacific settlement that still remain and encourage collaborations with archaeologists and local communities to identify some of the archipelago, island or site-specific questions that might be addressed by applying the commensal approach.