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The Archaeology of Prehistoric Oceania

Ethan E. Cochrane and Terry L. Hunt

The Oxford Handbook of Prehistoric Oceania
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Abstract and Keywords

The archaeological record of Oceania stretches over one-third of the earth's surface with the first humans entering Oceania 50,000 years ago and with the last major archipelago settled approximately a.d. 1300. Oceania is often divided into the cultural-geographic regions of Polynesia, Melanesia, and Micronesia, but these divisions mask much variation, and they do not always accurately characterize the historical relationships among Oceania's populations. Since the 1950s, archaeological researchers have investigated Oceania's human and environmental past and have focused on colonization chronologies and the origins of different populations, the intensity and spatial scale of interaction between groups, and changes in social complexity through time and space with a particular concern for the development of chiefdoms. Oceanic archaeologists often use historical linguistics, human genetics, and cultural evolution models to structure their research on ancient Pacific island populations.

Keywords: cultural evolution, chiefdoms, Melanesia, Micronesia, Pacific, Polynesia, Oceania

Oceania as a Region

Oceania comprises the islands of the Pacific Ocean and nearby seas settled by modern human populations in about the last fifty millennia. This definition of Oceania might seem too restrictive: Why not include Australia, for example, or even too broad, for what does highland New Guinea have to do with Hawai'i? Of course, demarcating regions is arbitrary, but by referencing culturally related populations we justify this definition of Oceania through archaeological questions of evolution and diversification in related human lineages. Archaeological research in Oceania thus stretches generally from New Guinea and Palau in the west to Rapa Nui in the east, north to Hawai'i, and south to

Aotearoa/New Zealand (Figure 1). Research in Island Southeast Asia is also often relevant to explaining variation in past Oceanic populations (see Denham's and O'Connor and Hiscock's essays), but the material culture patterns, the archaeological remains, are different enough from those found in Oceania, to maintain the separation. Australian and Oceanic groups diverge shortly after the earliest settlement of these areas and consequently little recent cultural relatedness is shared between the populations of these two regions. Similarly, a few other islands in the Pacific such as those of Japan or the Channel Islands off the southern California coast are not typically considered Oceania as the indigenous populations of these places do not share a common ancestry with Oceanic groups, except for a time far before humans sailed Pacific waters.

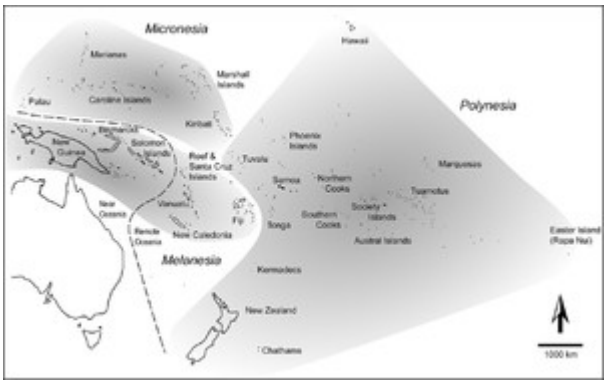

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Figure 1. Map of Oceania highlighting places and boundaries of archaeological interest.

Melanesia, Polynesia, Micronesia

In addition to separating Oceania geographically and culturally from other areas, there is a long history of dividing Oceania internally. The Oceanic regions of Melanesia, Polynesia, and Micronesia are well known and their historical origins in the work of Dumont d'Urville have been examined by Clark (2003a). As he notes, d'Urville's division of Oceania into these regions was not just geographic, but employed nineteenth-century racist generalizations about the cultural characteristics and sociopolitical evolutionary stages of populations. Polynesians were viewed as the most advanced, existing in well-developed chiefdoms, Micronesians slightly less so, and Melanesians without much inherited social hierarchy were placed at the bottom of this Spencerian evolutionary ladder. While modern scholars reject d'Urville's and others' developmental, racist inferences of these divisions, the regions geographically frame much of the archaeological, anthropological, and linguistic research in Oceania. Polynesia is also often further subdivided into West Polynesia comprising Tonga, Sāmoa, and nearby small islands, with East Polynesia comprising the rest of the Polynesian triangle from Hawai'i, to Aotearoa/New Zealand, and Rapa Nui, with Central East Polynesia designating the Society Islands, Marquesas Islands, Cook Islands, Tuamotu Islands, Gambier Islands, and the Astral Islands.

While Polynesia, Melanesia, and Micronesia are now used geographically and sometimes to connote shared culture, several researchers continue to question their usefulness (Clark 2003b; Terrell 2012; Thomas 1989). Clark (2003b), for example, notes that similarities and differences in material culture, both ancient and ethnographic, are not always accurately captured using these geographic divisions. Similarly, John Terrell (2012) argues that categories such as Polynesia or Polynesian are unhelpful as they mask variation but also that they are long-lived for at least two reasons. First, the category Polynesian intuitively fits our common sense that sees a world comprised of relatively homogeneous ethnic groups, nationalities, and genders. And second, the prevailing western view of the Pacific has been one of faraway islands, whose perceived isolation and boundedness reinforces the appeal of using essentialist categories to refer to island inhabitants.

In contrast, other researchers find Polynesia, in particular, to be a useful and valid analytical unit, not simply due to its geographic boundaries (e.g., Kahn’s essay). Patrick Kirch and Roger Green (1987, 2001), for example, argue that commonalities of language, behavior, and material culture across Polynesia result from the branching (i.e., cladogenic) evolution of Polynesian populations descended from an ancestral population in Tonga and Samoa. Therefore, Polynesia, according to Kirch and Green (2001) is a phylogenetic unit, or a unit defined by relatedness, and within which it is possible to reconstruct the cultural patterns of ancestral societies, trace the branches that diverge from them, and explain cultural similarities and differences as results of adaptations to new environments, innovations, shared ancestral features, borrowings, and the like.

While Melanesia has often been generalized in modern scholarship with reference to its diversity, and Polynesia for its homogeneity (Thomas 1989), Micronesia has no such recognized scholarly characterization, likely due to the paucity of research in the region, a situation that has begun to change since the 1970s. Micronesia has often seemed peripheral to the scholarly debates playing out in Melanesia and Polynesia, but this is changing with the increasing pace of research in Micronesia and the cumulative nature of much of this work (e.g., Athens’s and Fitzpatrick’s essays).

Near and Remote Oceania

Undoubtedly, the most significant regional boundary for Oceanic archaeology, as well as anthropology, linguistics, and biology, is that between Near and Remote Oceania. Roger Green (1991b) described this boundary (see also Pawley and Green 1973), running north–south between the Solomon Islands to the west and the Reef and Santa Cruz Islands to the east (see Figure 1) to separate those archipelagos of Melanesia and Polynesia first colonized approximately 3,000 years ago—Reef and Santa Cruz Islands, Vanuatu, New Caledonia, Fiji, Sāmoa, and Tonga—from New Guinea and surrounding islands such as the Bismarcks, first populated beginning almost 50,000 years ago.

The boundary between Near and Remote Oceania is more plainly biogeographic than the boundaries between Melanesia, Polynesia, and Micronesia. The shortest distance between islands on either side of the Near and Remote Oceanic boundary is the approximately 350 km stretch of open ocean between San Cristobal (Makira) in the Solomon Islands and Nendö in the Santa Cruz Islands. It is the distance between the islands of Near and Remote Oceania that has served as a barrier to the migration of plants and animals between the regions over millennia. For example, there are more than 120 species of birds in the Solomon Islands, but only a few more than 50 in Fiji (Green 1991b: 494). About one-quarter of the seed-plant genera that exist in New Guinea and Island Southeast Asia are not found to the east of the Solomons (Green 1991b: 495). The increasingly depauperate flora and fauna as one travels east from Near to Remote Oceania is a pattern that continues from West Polynesia, to East Polynesia, and to the small and isolated islands near Polynesia's boundaries, consistent with R. H. MacArthur and E. O. Wilson's (1967) generalizations of island biotic diversity and island accessibility.

The ocean gap between San Cristobal and the Santa Cruz Islands that restricted the movement of plants and animals also restricted the movement of people until a likely breakthrough in maritime technology (see Anderson's essay and Irwin 1992) and global environmental changes that facilitated open ocean, return-trip voyaging (Anderson et al. 2006; Cochrane 2017). Additionally, the environment of Near Oceania consisting almost exclusively of inter-visible islands, and mostly lying between the typhoon belts of the western Pacific, has been characterized as a voyaging corridor (Irwin 1992; Terrell 2004). This was an area where people were able to practice ocean travel for almost 50,000 years in a relatively safe maritime environment. Once ancient voyagers sailed east past San Cristobal they entered a world without inter-visible islands outside the main archipelagos, and open ocean voyages weeks in length. The straight line distance from central Vanuatu to Fiji, for example, is over 800 km.

The first groups to settle the southwestern archipelagos of Remote Oceania carried pottery labeled Lapita after a site in New Caledonia, some of it intricately decorated (see Terrell's essay), and they continued to make this pottery once they arrived on new islands. These voyagers, often labeled Lapita People (Kirch 1997), also brought a variable assemblage of domesticated plants and animals, stone tools from Near Oceanic sources, and they maintained links to Near Oceania and between their newly formed societies in Remote Oceania, evidenced by the transfer of artifacts between locations (see essays by Burley and Addison, Cochrane, Bedford and Spriggs, and Sand).

There are other geographic divisions of Oceania. The Andesite line to the east of Tonga for the most part traces the boundary between the Pacific tectonic plate and the plates surrounding it. The islands to the east of the Andesite line lack the generally more diverse and older continental geology of archipelagos such as New Caledonia and Fiji to the west. Oceania can also be divided into regions based on island types. William Dickinson's essay, for example, defines a series of atoll provinces, areas of island-arc segments and places where hot-spot tracks indicate mid-plate high islands.

A Brief History of Archaeological Research in Oceania

The chronological origin of archaeology's ascending role in explaining the Oceanic past arguably begins with Edward Gifford's archaeological field work in 1947 on the Fijian island of Viti Levu (Kirch 2000: 27). Preceding this was a little more than 200 years of western interaction in Oceania, including expeditions of intellectual and commercial exploration, missionization, imperial expansion, colonialism, and the beginnings of scholarly research.

While some of the earliest written records of Oceanic island life are based on the logs of sixteenth-century Spanish merchant ships (Lévesque 1992: 464–469), it is not until the latter part of the Enlightenment era that Europeans were more consistently plying the waters of the Pacific and recording observations of anthropological and archaeological relevance. James Cook's voyages on behalf of the British Admiralty and the Royal Society of London between 1768 and 1780 exemplify this period. On his three expeditions across the Pacific, he and his officers (and shipboard Pacific Islanders such as Tupaia from the Society Islands) made observations, collections, drawings, and paintings of island life pertinent to many archaeological explanations of Oceanic sequences (e.g., see Kahn's essay). The late Enlightenment expeditions, primarily by the British, French, and Americans, were followed by westerners who settled in the Pacific in the nineteenth century, missionaries (e.g., Williams [1858] 1982) and others (e.g., Fornander [1878–1885] 1969), and whose ethnohistoric accounts and additional writings have informed contemporary archaeological scholarship. Some missionaries produced orthographies of local languages, primarily to translate the Bible, and importantly these new written forms of language were used by Polynesians to generate accounts of island life around the time of European arrivals. Hawai'i has a particularly rich record of early historic indigenous scholarship (e.g., Kamakau 1992; Malo 1997) that has been used by archaeologists as an aid to explain the archaeological record (e.g., Cordy 2000; Kirch 2010a).

At the end of the nineteenth century, the beginnings of academic ethnology, the comparative study of cultures, took root in the region based largely from centers in New Zealand and Hawai'i. Founded in 1889, the Bernice Pauahi Bishop Museum of Ethnology and Natural History in Honolulu included a staff of ethnologists, ornithologists, botanists, and others whose fieldwork and research resulted in monographs on a variety of topics including descriptions of material culture that have much research potential today (e.g., Cochrane 2015; Rogers and Ehrlich 2008). A large corpus of descriptions of material culture, behaviors, and beliefs of Pacific Island peoples was produced during the first decades of the twentieth century, as part of major collecting or research expeditions, and occasionally involving archaeological excavation. However, throughout the first half of the twentieth century, it was ethnology, not archaeology, that was used to investigate Oceania's past. The primacy of ethnology is an outcome of both disciplinary history and incorrect assumptions of these early scholars. First, in the early 1900s, ethnology in the

Americanist tradition was not strictly separated from archaeology; both nascent disciplines, along with linguistics, were used to investigate Native American cultures, primarily in the United States (Trigger 2006). This approach to studying other cultures was exported to parts of Oceania through institutions such as the Bishop Museum. Second, scholars such as Linton (1955) assumed there was no appreciable time-depth or temporal change in Oceanic cultures and that archaeology, therefore, had little to offer.

This changed after World War II with Gifford's work in Fiji. In the 1920s, Gifford had conducted ethnographic research in Tonga as part of a research expedition sponsored by Bishop Museum (Gifford 1929) and now he proposed to conduct archaeological excavations in Fiji to determine if there was cultural change over time in this island group, in contrast to the presumed absence of change in Polynesia. Gifford (1951) successfully excavated pottery and other materials from two sites and proposed a chronology of three periods based on changes in ceramic surface treatments and other stratigraphic variation (see Cochrane's essay). Gifford and Shutler (1956) then moved on to New Caledonia where their excavations uncovered pottery from the eponymous site of Lapita, and which Gifford recognized as similar to pottery from Tonga that he had seen over thirty years ago (Kirch 2000: 27). With radiocarbon dating now a new tool for archaeologists, charcoal associated with the pottery was submitted for dating in 1951, with a result of approximately 2,800 years old. This date challenged previous assumptions of the limited time-depth of Oceanic cultures and indeed in the same decade additional radiocarbon dates of approximately 3,500 years old from the Marianas (Spoehr 1952), and approximately 950 years old from Hawai'i (Emory 1959) demolished those assumptions. Not surprisingly, in the second half of the twentieth century, archaeology became an increasingly important discipline for investigating Oceanic cultural change, and scholars focused on archaeologically delineating cultural chronologies for archipelagos and islands.

Archaeology's rise in Oceanic scholarship began just a few years before the New Archaeology, an intellectual movement very much concerned with articulating adaptive processes of cultural change and led by archaeologists in the North America and Great Britain (O'Brien, Lyman, and Schiffer 2005). The New Archaeologists were less interested in delineating time-space relationships, tasks that they perceived as perhaps necessary, but ultimately lacking any explanatory component (Flannery 1967). In the Pacific, however, owing to the shorter history of archaeological research, questions concerning cultural chronology and time-space relationships continued to be important throughout the 1960s (Golson 1961; Green 1963; Sinoto 1962, 1968) and today (see Rieth and Cochrane's essay). There were, however, other interests besides chronology in 1960s Oceanic archaeology, including settlement system analysis (Green 1961), typologically based cultural evolution (Suggs 1961), and historical linguistics (Green 1966). These would continue to play an important role over the coming decades and still play a large part in the interpretation of the Oceanic archaeological record today (see Morrison and O'Connor's and Pawley's essays).

The phylogenetic approach, among the most prominent interpretive approaches in Oceanic archaeology, also has its origins in mid-twentieth-century scholarship. The phylogenetic approach is based on the proposition that the human past can be understood, in part, as a series of population radiations, with both subsequent interaction and independent cultural evolution (Mace, Holden, and Shennan 2005). In Oceania, the phylogenetic approach is based on the premise that different human groups developed from a common ancestral population, colonized separate islands or archipelagos, and then underwent cultural, linguistic, and biological evolution in relative isolation on their island homes (Goodenough 1957; Linton 1955; Sahlins 1958). Such presumed phylogenetic sequences encouraged many to view Oceanic islands as cultural laboratories, whereby differences and similarities between societies could be explained through common ancestry, adaptations to local natural and social environments, and, less often, cultural diffusion (Goodenough 1957: 154). In the last few decades, scholars have tended not to treat population isolation in such a categorical fashion, and the “islands as laboratories” or comparative phylogenetic approach has become the dominant means of interpreting archaeological sequences of culturally related societies (Kirch 1984; Kirch and Green 2001; and see Kahn’s essay). Indeed, the phylogenetic approach, along with various cultural transmission processes, is now used worldwide to explain human cultural and linguistic variation (Lipo et al. 2006), although the approach has slightly different origins depending on discipline (e.g., archaeology or human behavioral ecology) and region.

There are, however, theoretical and substantive challenges to the comparative phylogenetic approach (Terrell, Hunt, and Gosden 1997). Theoretical challenges come in two forms. First, scholars from a variety of disciplines suggest that cultural variation and processes of cultural change have no counterparts in biologically based evolution so that concepts such as transmission and adaptation are not relevant to culture (Gould 1991; Ingold 2013; Johnson 2011). Second, since the middle of the twentieth century, researchers in archaeology and anthropology have argued that cultural similarities and differences across human groups rarely follow the branching patterns of descent often associated with the phylogenetic approach (Kroeber 1948; Steward 1944). Instead, it is better to begin with the proposition that cultural lineages often intertwine and form reticulate patterns of relatedness (Moore 1994; Terrell 1988). Although not the place for an extended presentation of these issues, recent research has demonstrated that the importance of cultural reticulation or branching is historically contingent and should be investigated in each instance (Collard, Shennan, and Tehrani 2006; Shennan, Crema, and Kerig 2015). Regardless of a priori positions on the typical modes of cultural change, a large body of literature has firmly established the applicability of Darwinian evolution and cultural transmission for explaining behavioral and artifactual variation, distinct from, but interacting with, biological variation (for recent book-length treatments, see Mesoudi 2011; O’Brien and Lyman 2000; Shennan 2002).

In addition to theoretical debate, several substantive challenges to the phylogenetic approach are a product of Oceanic archaeological research (e.g., see Denham's essay). In the main, this research examines the correlation of language, biology, and culture (behaviors and artifacts), or the lack thereof, to investigate the degree to which populations in the Pacific have maintained a unified and discrete set of characteristics through time, and sometimes over geographic space. A long-running research project on the north coast of New Guinea (Terrell and Schechter 2011; Terrell and Welsch 1991) has used ethnographic material culture collected from numerous villages, almost all with different languages (some from different language families), to examine the possible correlations of material culture and language, often a defining characteristic of a population. The data produced from these material culture collections have been analyzed by a number of researchers, some of whom argue that the language-defined populations do not have distinct material culture repertoires. For example, Robert Welsch et al. (1992: 592) note that "the similarities and differences among these village [material culture] assemblages are most strongly associated with geographic propinquity, irrespective of linguistic affinities." Their conclusions suggest that our ability to use archaeological material culture distributions to track distinct populations, such as those defined by language, may be suspect. Other researchers, however, have analyzed the same ethnographic material culture data and concluded that both language similarities and geographic distance are correlated with material culture similarity in New Guinea North Coast villages (Roberts, Moore, and Romney 1995). J. M. Roberts et al. (1995: 775) believe that language "is one of the strongest tools for the decoding of historical relationships among groups" and that the phylogenetic approach is a useful research strategy. While there remain unresolved issues concerning statistical procedures and artifact classification in these ethnographic data (Dunnell 1995), it seems that on the New Guinea North Coast there is no simple relationship between material culture, geographic space, and language-defined populations.

Themes in Archaeological Research in Oceania

Colonizations and Population Origins

The island setting of Oceania compels research on human colonization. Islands separated by seas and with archaeological records of varying age reflect the history of human movement and have been a recurrent focus of Oceanic archaeology (Cochrane 2017; Buck 1938; Finney 1979; Irwin 1992; Kirch 2010b; Sharp 1956). Over the last fifty years, research on the timing of island colonization has produced more accurate and precise dates for first settlement with the advent and refinement of radiometric techniques (e.g., Zhao, Yu, and Feng 2009), greater attention paid to taxa identification (e.g., Allen and Huebert 2013) and contextual information from deposits (Rieth and Athens 2013; Spriggs and Anderson 1993; Wilmshurst et al. 2008; Wilmshurst et al. 2011), and the application

of Bayesian models (e.g., Dye 2015). Timothy Rieth and Ethan Cochrane's essay summarizes the most recent cultural chronologies and colonization times for all of Remote Oceania, while essays by Sue O'Connor and Peter Hiscock, J. Peter White, and Jim Specht, each do the same for Sahul, New Guinea, and the circum-New Guinea islands, respectively. From these chronological summaries, it is clear that the broad outlines of population movements and colonizations as now presented are not likely to change much, even though future research will increase dating precision. Less well-known, however, are the timings of some important changes within cultural sequences and this lack of knowledge can limit our understanding of prehistory. For example, Specht (see essay) notes that there are chronological uncertainties for the introduction of domesticated dog and pig in the Bismarck Archipelago. These uncertainties partly underlie competing interpretations of Lapita population interactions and migrations in the area (e.g., see Terrell's essay). Better chronological data should lead to more definitive evaluation of these and other competing archaeological conclusions.

Although paleoenvironmental analyses of Oceanic islands comprise a research theme in their own right (Athens and Ward 1995; Haberle, Stevenson, and Prebble 2010), such work is also applied to questions of colonization and population origins (Athens and Ward 2004; Kirch and Ellison 1994; Prebble and Wilmshurst 2009). Kirch and Ellison's (1994) work is among the first to specifically apply analyses of paleoenvironmental data, such as variation in anthropogenic sediments, charcoals, and plant microfossils to the question of colonization chronologies. Using sediment cores from the East Polynesian island of Mangaia, Kirch and Ellison argued that a transition from peat to clay deposition, correlated with changes in the abundance of charcoals and certain plant taxa, was evidence of human use of the landscape, primarily involving forest clearance beginning approximately 2500 B.P. This interpretation of the paleoenvironmental data was controversial as the earliest artifactual evidence of human colonization of Mangaia appears 1,500 years after the paleoenvironmental changes (Anderson 1994). And while it is now generally accepted that the artifact-associated dates depict the correct chronology of Mangaian colonization (e.g., Kirch et al. 1995), the Mangaian paleoenvironmental research highlights potential difficulties with using paleoenvironmental data as proxies for human activity, even in Oceanic island settings that perhaps offer the best opportunity to distinguish pre-human and human-modified environments. In some regions of Oceania, including western Micronesia (see Fitzpatrick's essay) and Rapa Nui (Easter Island, see Hunt and Lipo's essay) chronologically discordant paleoenvironmental and artifactual records of island colonization are still to be reconciled.

While we can expect increases in the dating precision of colonization events, research on the origins of populations—where groups come from and how they might be characterized in terms of ethnicity or similar concepts—will likely remain an open question for some time. Lapita colonization is an exemplar of this research, for Oceania and the world. As noted, around 3000 B.P., the initial colonizing populations of southwest Remote Oceania carried with them a distinctive pottery called Lapita, much of it intricately decorated with repeated motifs that are shared across different archipelago assemblages (Figure 2). This same pottery, with the same motifs, appears in Near

Oceania, primarily New Britain, New Ireland, and the Admiralties a few hundred years before colonization of Remote Oceania, so the homeland of Remote Oceania's colonizers is clearly situated in those Near Oceanic islands. The Lapita colonists of Remote Oceania also brought with them lithic tools and domesticated plants and animals from Near Oceania, New Guinea, and Island Southeast Asia that were not native to Remote Oceania, variably including aroids (e.g., taro), banana, yam, pig, chicken, and commensal rat, among others.

Click to view larger

Figure 2. Decorated Lapita sherd from the Nenumbo site, Reef Islands, dating to approximately 1000 BC.

Photograph by Tim Mackrell, University of Auckland, used with permission.

How populations with Lapita pottery in both Near and Remote Oceania might be characterized in terms of ethnicity or cultural affiliation is contentious. There was undoubtedly widespread sharing of ideas about decorating pots as most of these assemblages are made from local clays and temper. This, and other similarities between Lapita pottery groups including human and commensal species DNA, reconstructed language similarities, artifact transfers, and similarities in adze forms and shell ornaments, has lead most archaeologists to agree with Golson's (1961: 176) half-century old assessment of Lapita pottery and associated artifacts as representing a "community of culture." What exactly this phrase might mean and how it might differently apply to Near and Remote Oceanic populations are debatable. Terrell (see essay), for example, argues that in Near Oceania the Lapita archaeological record (including the pottery and co-occurring artifacts already listed), and the associated biological and linguistic records is better understood as a "community of *practice*," where linguistically, biologically, and to some extent culturally diverse local populations shared some elements of their material culture and behaviors. A more homogeneous subset of this community of practice then went on to colonize Remote Oceania. Terrell's formulation has much in common with earlier proposals that the Lapita archaeological record resulted from the increasing spatial extent of population interactions in Near Oceania over time (Allen 1984; Terrell 1988).

In contrast, the position held by the majority of Oceanic archaeologists (articulated by Kirch 1997) is that the Lapita record was largely produced by an intrusive and biologically related population or populations that migrated to the circum-New Guinea islands of Near Oceania, spoke a similar (proto-Oceanic) Austronesian language or

languages, and likely represented “related groups of peoples who possessed a sense of ethnicity derived from their common origin” (Green 2003: 113). Within Near Oceania these groups created a new form of pottery, innovating on similar forms of pottery in Island Southeast Asia. They integrated with existing Near Oceanic populations and their material culture (e.g., shell ornaments), distribution systems (e.g., obsidian), and horticultural subsistence regimes (Green 1991a). After a few hundred years in these islands, these relatively homogeneous populations, relative to indigenous Near Oceanic peoples, colonized Remote Oceania.

Both of these scenarios draw upon historical linguistics and the biology of humans and their domesticates to characterize the populations that produced the Lapita archaeological record and to determine the geographic origins of those populations. Those who view the Lapita archaeological record as predominantly the result of a population intrusion from Island Southeast Asia point to the distribution of Austronesian language subgroups as support (see Pawley’s essay). The majority of Austronesian language subgroups are found in Island Southeast Asia and a single subgroup is the only language family in Remote Oceania (except in parts of western Micronesia) and is also found primarily in coastal locations of Near Oceania. This language distribution is expected, many argue (Blust 1996; Kirch 2010b; Spriggs 2011), if Austronesian-language-speaking populations migrated from Island Southeast Asia (Taiwan is typically considered the starting point) to Near Oceania and into Remote Oceania. Others (Donohue and Denham 2010; Terrell, Hunt, and Bradshaw 2002), however, note that Austronesian subgroups in Island Southeast Asia (outside Taiwan) and Near Oceania are not hierarchically ordered and thus cannot be used to suggest a sequential population movement beginning in Taiwan, moving south through the Philippines and into the circum-New Guinea islands. They note that the distribution of Austronesian subgroups and characteristics of many Island Southeast Asian and Near Oceanic Austronesian languages are likely related to ecological diversity and regional interaction between speakers of Austronesian and non-Austronesian languages, interaction that is also evidenced by artifacts and human and animal biology (see Denham’s essay).

The records of human and animal biology, as detailed, for example, in DNA, plant microfossils, and animal translocations, are also trained on the question of population origins, including Lapita. Polynesians, those populations largely derived from a homeland in Tonga and Sāmoa before further eastward colonization, are predominantly descendants of the original Lapita colonizers of southwest Remote Oceania. Polynesian populations have a very high frequency of the mtDNA haplogroup B4a1a1a, known as the Polynesian motif. This haplogroup is also present in Taiwan, Island Southeast Asia and Near Oceania, but in lower frequencies, and suggests that the Lapita populations, and their Polynesian descendants, ultimately derive from Taiwan (Friedlaender et al. 2008). However, additional work on the Polynesian motif indicates it may have developed in Near Oceania several thousand years before the advent of Lapita pottery (Soares et al. 2011). Other genetic research using Y-chromosome markers, short tandem repeats, single nucleotide

polymorphisms, and genetic variation of commensal and domesticated species such as rats and pigs supports a general Island Southeast Asia and Near Oceanic origin for Remote Oceanic populations (Larson et al. 2007; Matisoo-Smith 2015).

It may be some time before the question of Lapita origins is answered as different explanations of the archaeological, linguistic, and biological records are often based on different epistemological and theoretical positions, such as that surrounding the phylogenetic approach. Still, similar questions are asked about population origins in the post-Lapita records of Near and Remote Oceania. Like Lapita origins, the origins of the Polynesians have occupied much of Oceanic archaeology, as well as in anthropology and linguistics. Research in historical linguistics (Marck 1996; Wilson 2012), biological data (Knapp et al. 2012; Matisoo-Smith and Robins 2004), and artifact transfer (i.e., provenance) analyses (Collerson and Weisler 2007; Weisler and Kirch 1996) have often contributed to details of population origins and the relatedness of different Polynesian populations. Similar work has also addressed the origins of western Micronesian groups (Hung et al. 2011; Winter et al. 2012) and the divergence of Polynesians and Melanesians from a presumed common ancestral Lapita population across Fiji and Tonga-Sāmoa (see Cochrane’s essay; Burley 2013).

Connections between Groups

In addition to contributing to research on population origins, the study of connections between populations—typically analyses of artifact transfers, trade and exchange relationships, and other distribution systems—has been a persistent focus of study in its own right. The study of connections between populations, more broadly interaction, is often investigated by generating data on the sources of non-local artifacts in assemblages or the stylistic similarities between various artifacts in different regions or islands, although comparative linguistics has also contributed much (see Pawley's essay). The artifact data, in turn, have been used to support various ideas about the cultural systems within which artifacts moved (Aswani and Graves 1998; Green and Kirch 1998).

The earliest artifactual evidence for connections between Oceanic populations is found in Near Oceania with the distribution of obsidian from New Britain to New Ireland in the Bismarck Archipelago approximately 24,000 years ago, contemporary with the human translocation of terrestrial mammals from New Guinea to the Bismarcks (see Specht's essay). Over the ensuing twenty millennia the movement of obsidian expanded with artifacts from obsidian sources on additional islands incorporated into distribution networks and moved over greater and greater distances (Fredericksen 1997; Summerhayes 2009). Other kinds of objects were moved around New Guinea and the islands surrounding it. Obsidian stemmed tools, including utilitarian items and status objects, as well as mortars and pestles from various rock types, and in stylized bird shapes and other designs, were transported across the Bismarcks, Admiralties, and coastal and highland New Guinea. The transfer of obsidian, mortars, and pestles began approximately 8000 B.P. and appears to have ended around 3000 B.P., although many of the objects are of undetermined age (Torrence, Kelloway, and White 2013; Torrence and Swadling 2008). Economic plants were also moved between locations. At Kuk, in highland New Guinea, one of the world regions where agriculture independently emerged, the starch grains of taro, *Colocasia esculenta*, with a naturally occurring lowland distribution, have been found on stone tools at the 2,000 m site dating between 10,000 and 9000 B.P. (Denham et al. 2003; see also White's essay).

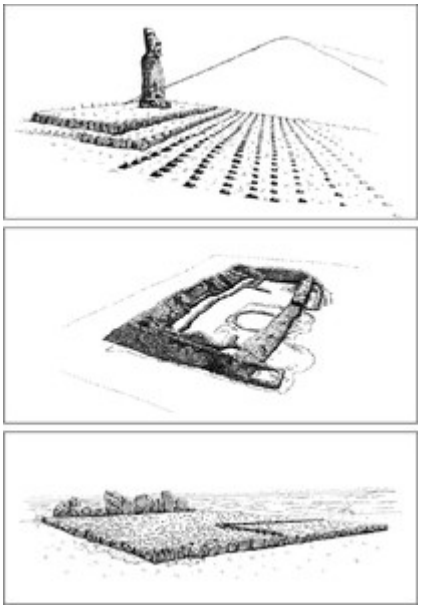
The spatial extent of artifact transfers expanded again with the advent of Lapita pottery in the Bismarcks and the subsequent colonization of Remote Oceania. These populations transported obsidian from New Britain as far east as Fiji, 3,000 km distant, and the intervening archipelagos of Vanuatu and New Caledonia, despite the fact that there are obsidian sources in these archipelagos that were also used. Amazingly, at approximately the same time New Britain obsidian was also transported 3,500 km west to Borneo (Fredericksen 1997). In addition to these vast transport distances, some items, including both lithics and small amounts of ceramics (see, e.g., Dickinson 2006), were moved in local and regional spheres within Lapita-era Near and Remote Oceania and archaeologists have proposed several models to explain these multi-scalar distribution systems (Green and Kirch 1998; Reepmeyer, Clark, and Sheppard 2012; Sheppard 1993).

Along with studies of artifact transfer based on raw material provenance, archaeologists have examined stylistic or homologous similarities across artifact assemblages to identify connections among populations (e.g., Mead et al. 1973). For example, the similarities in Lapita pottery surface motifs in assemblages across Near and Remote Oceania indicate both widespread sharing of ideas over the entire Lapita spatial distribution and also the existence of geographic zones within which interaction and the transmission of styles took place at a higher frequency than between zones (Anson 1983; Cochrane and Lipo 2010; Green 1979; Sand 2001). Similarities of ceramic surface treatments and possibly homologous formal similarities appearing after the Lapita era in Near and Remote Oceania have also been examined and a variety of local and regional interaction spheres proposed (see essays by Bedford and Spriggs, Cochrane, and Sand), along with specialized production and distribution systems (Irwin 1985). In the last millennium of prehistory in the southwest Pacific, basalt adzes from Sāmoa were transported great distances, with many adzes carried to Fiji, but also as far west as the islands near Vanuatu and east to the Cook Islands (see Burley and Addison's essay and Cochrane and Rieth 2016).

After colonization of East Polynesia, beginning approximately 900 B.P. (Rieth and Cochrane's essay), interaction between distant archipelagos and islands continued for some time as evidenced through artifact transfer, presumed homologous artifact similarities, and oral traditions. As there are no prehistoric ceramic traditions in East Polynesia, lithic provenance studies have contributed much to characterizing connections between groups there. Research by Weisler and his colleagues (Collerson and Weisler 2007; Weisler and Kirch 1996; Weisler and Woodhead 1995) has demonstrated the connections between distant archipelagos—from Hawai'i to the Tuamotus to islands within Central East Polynesia, such as the Marquesas and Society Islands—by tracking the distribution of basalt adzes relative to their basalt raw material source locations. While many of the analyzed adzes are not from dated contexts, their transport throughout East Polynesia likely began shortly after colonization and continued until approximately 500 B.P. (Rolett 2002), after which time basalt artifacts cease to be imported to many coralline atolls and makatea limestone islands (Weisler 1995).

Potentially homologous similarities between artifacts are also considered evidence of connections between East Polynesian populations. The earliest artifacts in the region are often grouped under the label East Polynesian Archaic and include one-piece shell fishhooks, distinctive adze forms, and bone and shell ornaments distributed across East Polynesia (see essay by Kahn), including Aotearoa/New Zealand (see Anderson's essay), although they are largely absent from Hawai'i. While Allen (1996) explicitly documents homologous similarities in East Polynesian fishhooks, the homologous character of other East Polynesian Archaic artifact similarities is assumed, and it is possible that some similarities, adze shapes, for example, could be attributed to independent invention and functional processes (Dunnell 1978; Kirch 1980).

It has also long been recognized that interaction and connections between groups are evident in the likely homologous similarities of East Polynesian ritual architecture (Bellwood 1978; Emory 1933; Graves and Ladefoged 1995). This ritual architecture typically comprises a rectilinear courtyard, sometimes paved with stone or coral and also sometimes with the border demarcated by stone alignments or walls. Stone and coral uprights are often placed within the courtyard and a platform or several may be placed within the structure (Figure 3). The platforms (*ahu*) and giant anthropomorphic statues (*moai*) of Rapa Nui are one expression of this tradition (see Hunt and Lipo's essay). Cochrane (2015) recently analyzed the similarities of East Polynesian ritual architecture using quantitative phylogenetic techniques and concluded that similarities were so extensive that widespread cultural sharing and rapid innovation of related architectural forms occurred. Others have interpreted similar trajectories of increasingly complex ritual architecture forms as the outcome of competition between elite members of society and their promotion of particular ideologies (e.g., Kahn and Kirch 2011; Wallin and Solsvik 2010).



Click to view larger

Figure 3. Ancient ritual architecture of Polynesia including *ahu-moai* Huri a Urenga, Rapa Nui (top), *heiau* Mo'okini, island of Hawai'i (middle), and *marae* Vaiotaha, Huahine, Society Islands.

Illustrations by Briar Sefton. Originally published in *The Journal of the Polynesian Society* (Cochrane 2015) and used with permission.

Changes in Political Complexity

The origins of elite society and of status differences have been a central theme of Oceanic archaeology for decades (e.g., Allen 2011; Kirch 1984; Rainbird 2006), much of this built upon the ethnographic record of Polynesia and the formulations of mid-twentieth-century scholars (e.g., Goldman 1955; Sahlins 1958). In general, the question posed by this research asks what are the processes that resulted in the ethnohistorically described ranked societies of the Pacific, ranging from the complex chiefdom or archaic state of Hawai‘i (Hommon 2013; Kirch 2010a), to the flexible, open chiefdoms of the Marquesas (Allen 2011), to the less hierarchical conical-clan structures in Micronesia (Rainbird 2004). The concept of chiefdom dominates this work and is used to characterize a population as generally having a number of traits—foremost hereditary inequalities (possibly including divine chiefship) but also, for example, craft specialists, surplus production, and a redistributive economy—traits that have been used by archaeologists across the world for over half a century (Flannery 1972). The concept chiefdom is not so easily applied, however, in parts of Melanesia. As Sheppard and Walter (2006: 143) note, the political history of Melanesia is less well-known and the social and political relationships in Melanesian populations seem to be structured less by hereditary inequalities and more by, for example, exchange systems, competition (ritual warfare, pig husbandry), and ancestor cults. Given the direction of colonization in Oceania, from, generally speaking, Melanesia to Polynesia, a related question in much Oceanic archaeological research on political complexity is: How were political systems lacking hereditary inequality, somewhat like Melanesia, transformed into the Polynesian chiefdoms?

In almost all work on this question, environmental productivity, and specifically productivity related to agriculture in various forms and intensities, is considered a primary driver of political complexity in Oceania (Kirch 1994) and globally (Mattison et al., 2016). However, it is not just productivity per se that is important, but how agricultural productivity is correlated with other variables in historically contingent situations including competition (Aswani and Graves 1998; Field 2004), population pressure on resources (Kirch 2010a), and different forms and control of intensification (Earle 1978; Ladefoged, Lee, and Graves 2008). Many Oceanic archaeologists argue an additional characteristic of Polynesian, or more accurately Austronesian, societies is necessary to explain changes in political complexity. Based primarily on historical linguistics (Pawley and Ross 1993: 444; and see Goldman 1955), they assume that status rivalry and competition is inherent in Austronesian societies and was either a basic component of increasing political complexity (e.g., Earle 1997) or perhaps a proximate cause (Kirch 2010a).

Agricultural productivity, changing control over agricultural products, and inherent status competition are combined in Ladefoged and colleagues’ (2008) explanation of increasing political complexity in ancient Hawai‘i (see also Kirch’s essay). They use environmental data in concert with ecosystem and demographic modeling to estimate changing

agricultural yields and population age-compositions across a 60 sq. km dry-land agricultural field system in Hawai‘i. Over 500 years of its existence, the field system expanded. Intensified farming practices within it were temporally and spatially variable with some areas partitioned by an increasing number of agricultural plots. The entire field system stretched across contiguous *ahupua‘a* or political territories, the number of which increased over time through subdivision as identified in the archaeological and ethnohistorical records. Ladefoged and colleagues analyzed correlated patterns of variation in life expectancy at birth and surplus agricultural production across territories under the assumptions that agricultural production and consumption take place within single territories (as recorded ethnohistorically), and surplus from each territory is controlled by a few individuals. Their analysis suggests that a particular configuration of fourteen territories that maximizes life-expectancy at birth was reached sometime between the fourteenth and seventeenth centuries, likely a century or more after farming in the area began, but that political-territorial subdivision of the field system continued, producing over thirty independent territories at European contact in the late eighteenth century. Ladefoged and colleagues argue that configurations of greater than fourteen territories result in lower and more variable life-expectancy at birth across territories, but higher (and more variable) surplus production. They speculate that individuals in control of surplus production, that is higher status chiefs, likely accrued fitness benefits at the expense of commoners and that this, in part, promoted the development of increasingly hierarchical society.

Future Archaeological Research in Oceania

Oceanic archaeological research on political complexity is primarily focused on the cultural sequences of Polynesian archipelagos or islands such as Hawai‘i, the Marquesas, the Society Islands, and others, in part because of the greater amount of archaeological, ethnohistoric, and paleoenvironmental research that has been done in Polynesia compared with regions to the west. This will, of course, change in the future, with more researchers working throughout Oceania. Additional research will likely produce a picture of greater human diversity in biological, linguistic, and cultural realms than is now known. Consider how knowledge of Lapita diversity has expanded in the twenty years since Kirch’s (1997) book-length summary of the preceding three decades: the Teouma cemetery site has transformed knowledge about pottery use, burials, health, diet, and migration (see Bedford and Sprigg’s essay); early ceramics from Tonga have compelled a re-evaluation of colonization models (see Burley and Addison’s essay); newly discovered Lapita sites on New Guinea’s south coast have expanded the known Lapita range (see White’s essay). Our basic knowledge of Lapita has changed little over the last twenty years, but our explanations now must better account for this increased diversity.

In addition to Lapita archaeology, future archaeological research focused on the themes presented in this essay will not only have to account for the increasingly varied empirical patterns we generate through additional fieldwork but also as a product of new analytical techniques. Future research will almost certainly remain comparative and with a foundation in environmental, ecological, and evolutionary processes as these characteristics are encouraged by, and are strengths of, Oceania's island setting. The essays in the *Oxford Handbook of Prehistoric Oceania* exemplify this current and future research.

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