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FOREIGN OBJECTS IN COLONIAL-ERA HAWAIIAN SITES: CHANGE AND CONTINUITY IN NINETEENTH-CENTURY NUʻALOLO KAI, KAUAʻI ISLAND

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ABSTRACT: Archaeologists in Hawaiʻi, and Polynesia generally, have often struggled to exploit the interpretive potential of foreign artefacts in indigenous settings. This paper considers a consequential foreign artefact assemblage from Nuʻalolo Kai, a remote area on the Nā Pali Coast of Kauaʻi Island, Hawaiʻi. This archaeological assemblage derives from deeply stratified, well-preserved deposits that were excavated by Bishop Museum staff between 1958 and 1964. While these excavations were aimed at identifying early settlement sites on Kauaʻi, numerous foreign artefacts dating from the nineteenth century were also encountered. This article considers how these foreign materials can be used to refine the chronology of site use in the post-contact period and to gain a more robust picture of the Nuʻalolo Kai community during this important period of socioeconomic change. The analysis demonstrates that the boundary between pre-contact and "post-contact" lifeways, as represented in archaeological sites in Hawaiʻi and elsewhere in Polynesia, may be blurred. Moreover, the arrival of foreign goods did not have an immediate and "fatal impact" on traditional Hawaiian ways of life but instead denote cultural continuity, innovation and change. Finally, it is argued that trajectories of change in the household assemblages of rural nineteenth-century Hawaiʻi may have varied considerably from those seen in more connected areas of the archipelago.

Keywords: colonial-era Hawaiʻi, Nuʻalolo Kai, historical archaeology, post-contact period, legacy collections, "fatal impact"

Archaeological studies in Hawaiʻi have traditionally been concerned with such questions as the chronology of archipelago settlement (Dye 2015; Kirch 2011) and the emergence of sociopolitical hierarchy (Hommon 2013; Kirch 1984, 2010). Only recently have the complex social dynamics that followed the arrival of Captain James Cook in 1778 become the subject of systematic study (Bayman 2009, 2014; Flexner 2012, 2014; Garland 1996; Kirch 1992; Lebo 1997; Mills 1996, 2002; Mills *et al.* 2013). The potential for objects introduced to Hawaiʻi by westerners—here referred to as historical artefacts or "foreign" objects—to provide information about daily life in Hawaiian households of the early colonial period remains mostly untapped. Foreign

artefacts at sites with both pre- and post-contact components are particularly poorly understood. Such artefacts have often been considered mere horizon markers, bounding the period "most pertinent" to archaeological research—the pre-contact period. Archaeologists focusing on pre-contact archaeology often describe foreign artefacts only briefly, if at all. Such treatment likely arises from the common assumption that the arrival of foreign objects occurred alongside the rapid alteration of traditional daily practices in domestic settings.

Archaeological studies of indigenous communities in colonial settings initially focused on Native American sites occupied after the arrival of Europeans (e.g., Deetz 1963; Di Peso 1974; Quimby 1960, 1966). These early studies often relied on narratives that emphasised cultural change as a progressive and unilineal process. As argued by scholars such as Deagan (1998) and Rubertone (2000), implicit in such studies was the view that as indigenous peoples incorporated increasing numbers of foreign objects into their daily lives, they experienced a "loss" of traditional cultural traits. Such studies tacitly suggested that the impacts of these changes on indigenous communities were so profound that they rapidly and categorically altered their ability to maintain a distinct cultural identity. In his critique of the archaeological literature referencing post-contact Māori sites, Bedford (1996: 411) has referred to this view as the notion of "fatal impact".

Recent archaeological research on the colonial period has emphasised cultural continuity over transformational change. A growing body of evidence suggests that members of indigenous communities often continued to practise aspects of traditional domestic routines well beyond the early post-contact period (e.g., Hunter *et al.* 2014; Panich 2013; Silliman 2009). Researchers have also explored how indigenous people incorporated foreign objects and ideas in "familiar" ways (Silliman 2014; see also Cipolla 2017) linked into existing cultural and social frameworks (e.g., Bragdon 2017; Liebmann 2015; Oland 2014). In a study of an early nineteenth-century fort at Waimea, Kaua'i, Mills (1996) argued that the fort's role as a European-style garrison could be best understood through a framework that also considers how its construction intersected with Hawaiian sacred and political symbolism. At a smaller scale, researchers such as Garland (1996), Lebo (1997) and Flexner (2014; see also Flexner *et al*. 2018) have begun to consider how Hawaiian households made use of foreign objects in ways that suited their specific needs.

This paper addresses the use of foreign artefacts in Hawaiian household sites, using a legacy collection from the Nu'alolo Kai Site Complex (50-30-01-196) on Kaua'i Island. The complex lies in a rugged and remote area of Kaua'i Island's Nā Pali Coast. It has been recognised as a possible regional ceremonial centre during the pre-contact period (Major and Carpenter 2007), and the artefact assemblage has been widely recognised for its exceptional preservation and diversity (e.g., Kirch 1985: 17). The collection contains

well-preserved perishable artefacts recovered from multiple buried strata deposited over several hundred years, some of which were potentially associated with high-status or chiefly Hawaiians. Radiocarbon dates from the site indicate that the area was first occupied as early as the period from the fourteenth to early fifteenth century AD (Graves *et al.* 2005). What has been little discussed, however, is that a significant portion of the Nuʻalolo Kai cultural deposits dates to the post-contact period.

Here I present an overview of archaeological findings from Nuʻalolo Kai with an emphasis on the analysis of the foreign artefacts collection. The foreign artefacts shed light on the role of these objects in domestic settings in a remote part of the archipelago. The foreign objects at the site extend from the early nineteenth century, when such items circulated primarily via exchange networks linked to foreign seamen, to the mid-nineteenth century. By the latter time, foreign objects were moving through land-based networks that emerged through the activities of the missionaries and the increasing industrialisation in the archipelago (Carter 1990). The appearance of foreign goods at Hawaiian house sites has been considered evidence of wholesale changes in household economies, and specifically, of increasing engagement in the market economy (Kirch 1992).

THE COLONIAL PERIOD IN HAWAIʻI

When Hawaiians sighted the ships captained by James Cook anchored off Waimea Bay in 1778, they were observing the first recorded visitors reaching Hawaiʻi since long-distance voyaging ceased in Polynesia in the fifteenth century (see Hommon 2013: 224). While Cook's arrival set off a multifaceted set of social and cultural changes in the Hawaiian archipelago, it also coincided with a period of social transformation already underway. Continuing centuries of bloody wars of conquest, by the late eighteenth century the Hawaiian chiefs had greatly intensified their efforts to unify the island chain (Kirch 2010). Over the next few decades after Cook's arrival, waves of foreigners—fur traders, sandalwood traders and whaling crews—began to reach the archipelago in increasing numbers.

Carter (1990) separated the initial introduction of foreign goods to Hawaiʻi into networks based on marine-based versus land-based exchange. This distinction was useful because it differentiated classes of foreign artefacts based on the historical context of their arrival in the archipelago. Ships' crews in the early post-contact period carried articles intended explicitly for exchange with Hawaiians. These included glass beads, nails and small bits of metal, scrap garments, buttons and mirrors (Carter 1990: 68). As interactions with foreigners became more frequent, members of the ruling class began to incorporate foreign objects into the local political economy. There is a long tradition of "exotic" goods in Polynesia serving as a medium of exchange

among high-status households (e.g., Kirch *et al.* 2012). By 1820, most members of the Hawaiian chiefly class owned a variety of foreign objects, such as western clothing and fine china (Bayman 2010; Sahlins 1992). Archaeologists have most frequently found foreign artefacts in early post-contact Hawaiian contexts at coastal sites associated with elite inhabitants (Carter 1990). Research by Garland (1996) and Lebo (1997) at house sites in downtown Honolulu has illustrated that these households quickly acquired various types of foreign goods and commercial food products.

The arrival of Protestant missionaries on Oʻahu and Kauaʻi in 1820 marked the emergence of a land-based economy that increasingly included the exchange of foreign goods (Carter 1990). The missionaries imported consumer products into their settlements, bringing increasing quantities of goods to the archipelago. They traded foreign objects to Hawaiians for labour and provisions. An 1823 station record from Kauaʻi recorded that Rev. Samuel Whitney exchanged *malo* 'loincloths' and *pāʻū* 'skirts' for labour, and knives, flints and mirrors for various supplies (Whitney 1823). They also encouraged Hawaiians' desire for foreign goods as part of a broad-based endorsement of western ideas such as wage labour, private property and the pursuit of "proper" forms of domesticity (see Grimshaw 1989; Sahlins 1992; Thigpen 2010).

As the nineteenth century continued, foreign goods became increasingly available as the economy became gradually more industrialised. Whalers frequently stopped in the archipelago's port towns beginning in the 1830s. The presence of whalers offered opportunities for farming households to produce surplus goods for market exchange; it also provided young Hawaiian men with the chance to work for wages (Sahlins 1992). Kōloa Sugar Plantation, the first industrial sugar operation in Hawaiʻi, was opened on Kauaʻi in 1835. A plantation market soon followed, where employees and others could barter for a selection of foreign goods such as "knives, needles, flints, calicoes, and all the numerous etcetera of a trading establishment" (Jarves 1843: 104). The use of cash became increasingly common after the mid-nineteenth century. In 1850, the Hawaiian Kingdom began to require the payment of taxes in cash (Linnekin 1990: 195). The formal process of land privatisation, which went into effect about that time, separated many families from the ancestral lands that had supported household economies based on subsistence farming.

Kirch's (1992) pioneering study in Anahulu, a rural valley on the North Shore of Oʻahu Island, shaped how we understand changes in the organisation of Hawaiian household economies in the post-contact period. Early post-contact sites from Anahulu yielded few foreign goods, and these primarily comprised small articles such as gunflints and glass beads. Increasing numbers of foreign objects began to appear in domestic contexts after about

1810; by the 1840s, household assemblages at Anahulu contained large and diverse assemblages of these items. According to Kirch:

> [These houses] now incorporated in their construction iron nails as well as glass windows and doors with iron hinges and locks. Their households possessed a variety of plates and dishes, bottles and jars of various shapes and contents, Western-style clothing, saddle gear, iron cooking pots, axes, razors, scissors, marbles, even cologne from Paris. The ancien régime of the Hawaiian ali'i did not disappear only with the passage of the Māhele and kuleana acts; it was swept away on a spring tide of the world economic system. (Kirch 1992: 179–80)

Based on Anahulu's distance from the city of Honolulu, one could easily interpret such dramatic changes as evidence that the archipelago's emerging market economy had spread uniformly through the archipelago by the mid-nineteenth century. Such a view would suggest that the expansion of the market economy completely disrupted the organisation of household economies across the archipelago, with Hawaiian households having quickly departed from traditional provisioning strategies.

The collection of foreign artefacts from Nu'alolo Kai offers an intriguing case study of post-contact-era artefacts from a particularly remote part of the archipelago; it allows us to consider how the setting of this community, accessible for canoe travellers but isolated from overland travel, may have contributed to variability in the trajectories along which such items were incorporated into the household. These objects likely arrived at Nu'alolo Kai through a myriad of interactions that included trade with mariners and, eventually, interaction with land-based exchange networks related to the work of the missionaries and the plantation markets. While opportunities to obtain foreign goods likely increased through time as such items entered the archipelago in increasing numbers, the geographical separation of the Nā Pali Coast from the remainder of Kaua'i likely shaped these connections in important ways.

Previous research at many Hawaiian house sites in rural areas has shown that by about the mid-nineteenth century, household items made from traditional materials had largely been replaced by foreign items (Kirch 1992; see also Anderson 2001; Flexner *et al.* 2018). This paper examines the foreign artefacts assemblage from Nu'alolo Kai and how the nature of the assemblage changed over the post-contact period. The analysis highlights the potential for variability in how Hawaiian households interconnected themselves with the market economy during this tumultuous period in the archipelago. It also enables us to reconsider the significance of foreign materials as indicators of change, since in many cases they appear to have been repurposed as part of familiar practices.

BACKGROUND TO NUʻALOLO KAI

Nuʻalolo lies near the western end of Kauaʻi Island's Nā Pali Coast, a stretch of rugged coastline on the island's northwestern edge (Fig. 1; Fig. 2). Nuʻalolo Kai is the coastal section of the Nuʻalolo *ahupuaʻa*, a traditional Hawaiian land unit. Sea cliffs rising as high as 1,200 m separate this section of the coast from the island's interior. Like much of the Nā Pali Coast, Nuʻalolo Kai is not easily accessible via overland routes. While there is an opening in the reef for small boats to land, large swells in the winter months often block sea access.

Immediately west of Nuʻalolo along the Nā Pali Coast is the ahupuaʻa of Miloliʻi. Recent archaeological work at several post-contact house sites here has shown that Hawaiians occupied grass-thatched houses into the last decades of the nineteenth century (Moore 2019). In 1901, Bishop Museum staff collected the superstructure from one of the traditional-style Miloliʻi houses that had been built in the mid-nineteenth century (Fig. 3), and it remains on display in the museum today (Kahn 2016; Kahn *et al*. 2016). Like the grass-thatched houses at Nuʻalolo Kai, this house was built on top of archaeological deposits that suggest a long period of previous use.

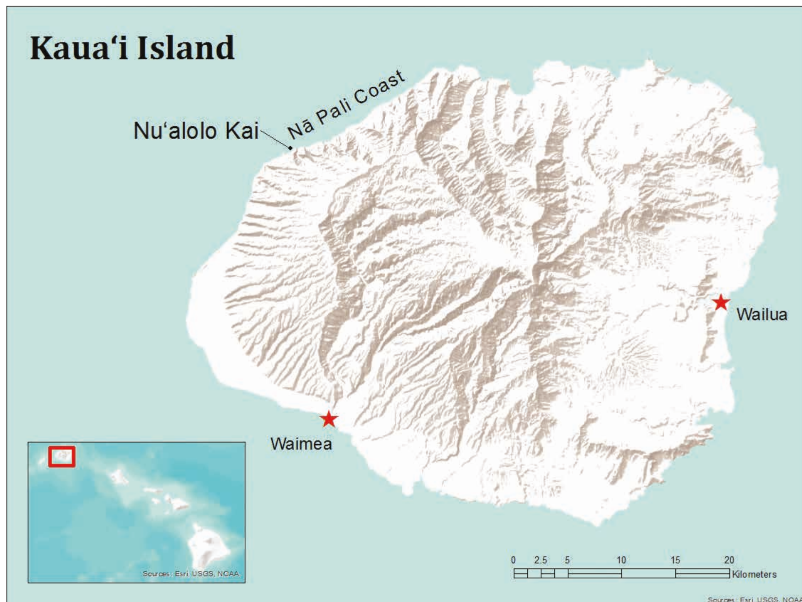

Figure 1. Area map showing the location of Nuʻalolo Kai, Kauaʻi Island, Hawaiʻi.

Figure 2. Nuʻalolo Kai and the Nā Pali Coast. The terraces where the houses stood are located at the base of the cliff, flush against the face, near the middle of the frame. Photo: Timothy De La Vega (2020), © TimDeLaVega.com.

Figure 3. Grass-thatched houses at the mouth of Miloliʻi Valley, ca. 1900. The house frame transported to the Bishop Museum is at the upper right. Photo: W.H. Deverill, Bishop Museum.

While Nuʻalolo is geographically isolated, it may once have been a prominent regional settlement. It appears in oral traditions known throughout Hawaiʻi (e.g., Pukui 1983: 82, 214, 261). These accounts describe both its renowned *ʻōahi* ʻfirebrand-throwing displayʼ and a wooden ladder that connected the coastal flat with agricultural fields above. The coastal area contains an undated ceremonial complex, which is the largest such complex on the Nā Pali Coast. The reef had a natural pass through which canoes could enter and safely land, and historical accounts from the nineteenth century described Nuʻalolo Kai as a waypoint or "gathering place" for canoe travellers moving along the Nā Pali Coast of Kauaʻi and between the islands of Kauaʻi and Niʻihau (Gilman 1978: 5).

The missionary Hiram Bingham provided the first written account of Nu ʻalolo in a description of his 1821 visit. He described seeing "ten houses of the little village" below the cliff face on the eastern edge of the coastal flat and about "70 men, women, and children" employed in poison-fishing on the reef (Bingham 1822: 248). Censuses of the 1830s offer information about the local population at that time. An 1831 census recorded 43 residents, and 48 residents were counted in 1835 (*Ke Kumu Hawaii*, 23 December 1835: 204). In 1845, the Boston merchant Gorham Gilman described a row of "huts" at the same location mentioned by Bingham. One of the most recent descriptions of Nuʻalolo was made in 1858, when several residents were involved in the rescue of six Hawaiians from the schooner *Prince of Hawaii*, which capsized between Niʻihau and Kauaʻi (*Ka Hae Hawaii*, 1 September 1858: 85).

During the archipelago-wide transition to private land ownership, a process referred to as the Great Māhele ʻland divisionʼ, no land claims were filed from Nuʻalolo. While there have been suggestions in later oral histories that permanent residents remained at Nuʻalolo into the 1910s (e.g., Ching 1967), first-hand accounts from the 1890s (Knudsen 1991: 164) and the early twentieth century (Chapin 1915) described the area as uninhabited. Permanent occupation of the area may have ceased prior to 1875. In that year, Boundary Commission surveyor James Gay mentioned that he asked residents from neighbouring Miloliʻi to show him the location of a Nuʻalolo boundary (Boundary Commission, Kauaʻi 1874: 1: 140–46). Because the account mentions no Nuʻalolo residents, it seems likely that few, if any, permanent inhabitants remained by that time.

ARCHAEOLOGICAL INVESTIGATIONS AT NUʻALOLO KAI

The grass-thatched houses described by Bingham (1822) stood on a row of stepwise terraces abutting the cliff face on the northern side of the coastal flat. The first archaeologist to investigate the terraces (Bennett 1931) was drawn by the presence of well-preserved artefacts eroding from the slope.

Subsequently, Bishop Museum archaeologists, hoping to find archaeological deposits that would provide information about the early settlement of Kaua‘i, excavated roughly 145 m^3 at the base of the cliff between 1958 and 1964 (Graves *et al.* 2005: 153). Excavations took place within four terraces labelled Features K2 through K5[1] (Fig. 4). Of the four terraces, only Features K3, K4 and K5 were submitted to systematic and well-documented excavation. The most extensively investigated terrace was Feature K3, where the museum archaeologists excavated 83 units 1 yd^2 (Graves *et al.* 2005: 157). Hunt (2005) later excavated another 2 m^2 on the same terrace.

Researchers identified a complex sequence of cultural levels in these terraces that included superimposed house floors, cists, hearths and earth ovens. Exceptional conditions preserved many items that would otherwise have biodegraded. The excavations yielded over 7,600 artefacts. Besides basalt adzes and bone and pearl-shell fishhooks, the terraces yielded artefacts linked to food processing and cooking, games and music, *kapa* ‘barkcloth’ production, ritual practice and adornment. Notable artefacts include a *niho palaoa* ‘whale-tooth pendant’ as well as bone tattoo needles, dog-tooth ornaments, shell beads and basalt mirrors. The site’s perishable assemblage included a unique collection of cordage (see Summers 1990), along with painted kapa and fragments of basketry, nets and woven mats.

Although the multi-year excavations by Bishop Museum archaeologists were never published, Soehren and Kikuchi (n.d.), two archaeologists associated with the museum, prepared a preliminary report. Lloyd Soehren was the field director for the project; William Kikuchi was part of the field crew and maintained a long-term relationship with the museum as a Research Associate. More recently archaeologists from the University of Hawai‘i (UH) inventoried and analysed the site’s vast collection of artefacts and faunal remains (Calugay and McElroy 2005; Graves and McElroy 2005; Graves *et al.* 2005; O’Leary 2005; and papers in Field and Graves 2015). As part of this initiative Graves and colleagues (2005) undertook an overview of the site’s stratigraphy, provenience data and chronology, which I draw on here. They divided the terraces into subfeatures based on the surface stone alignments. Thus, they split the area originally labelled Feature K3 into subfeatures K3a and K3b. Bishop Museum excavations occurred within both the areas referred to as K3a and K3b, although the K3b excavations accounted for by far the greatest area and thus produced the most cultural material. Graves and colleagues (2005: 7) included only Feature K3b in their artefact analysis. They separated K4 and K5 into K4a and K4b and K5a and K5b, respectively; however, excavations were undertaken only in K4a and K5a.

While the Nu‘alolo excavations were originally planned to proceed in arbitrary six-inch levels, in practice the depths of the levels varied widely between units. The arbitrary levels were later amalgamated by Soehren and

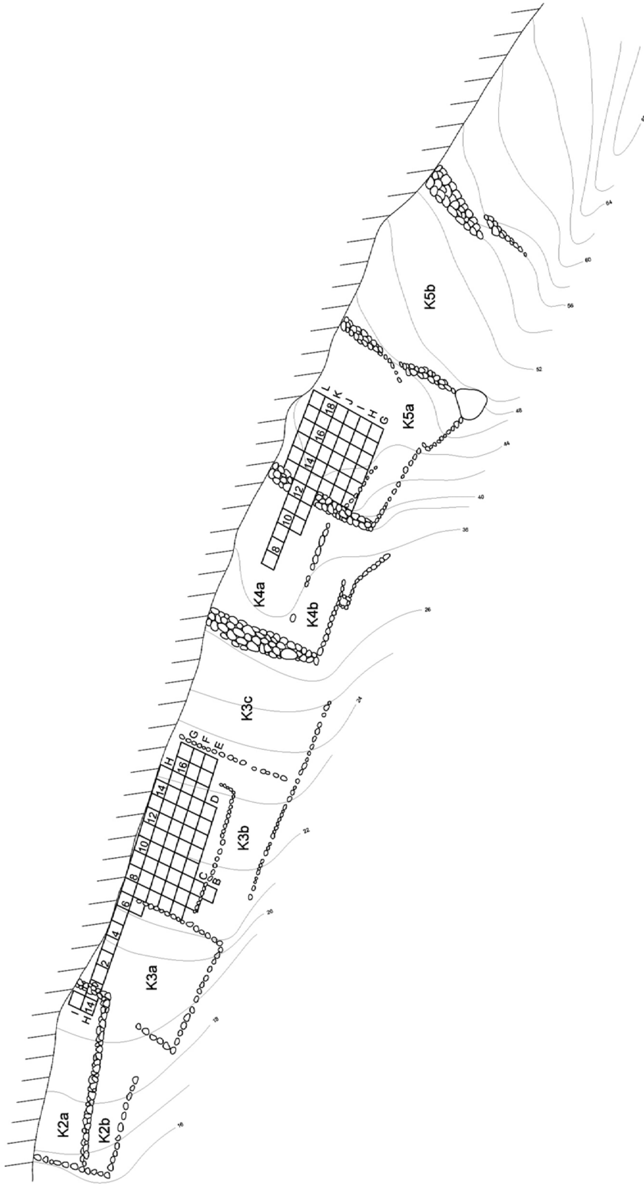

Figure 4. Site map showing Features K2, K3, K4 and K5 at Nuʻalolo Kai and excavation grids. Redrawn by Diana Izdebski from Figure 2 in Graves *et al.* (2005).

Kikuchi (n.d.) into what they considered the major units of archaeological relevance, units referred to as "cultural levels" by Graves *et al.* (2005). Unpublished profiles illustrate these post-excavation designations and refer to them by Roman numerals. So, for example, the deposits in Feature K3 (later K3a and K3b) were amalgamated into eight cultural levels, including a Surface level and Levels I to VII. Notably, in several cases Soehren and Kikuchi's cultural levels incorporated more than one sedimentary unit (i.e., strata/layers/facies in contemporary parlance) (see also Graves *et al.* 2005: 36). This resulted in some cultural levels being rather substantial in terms of depth, as for example Level I in the K3 terrace, which is 30.5 cm thick.

Also problematic was that during the field excavation, stratigraphic control was often poor and individual artefacts were often imprecisely located with respect to depth below surface; as a consequence many artefacts cannot be assigned to a specific cultural level. So, for instance, the depth ranges associated with the Bible pages in Feature K5 (later K5a) are quite broad, and consequently they were assigned to the rather general category of Levels I to III.

Graves *et al.* (2005: 1, 35–38) subsequently created analytic zones for Features K3b and K5a "to guide current and future analyses of artifacts and other materials derived from these features". These analytic zones (designated by Arabic numerals) combined cultural levels into larger units with the goal of generating units "whose deposits accumulated over approximately the same duration and which would provide sufficiently-sized samples of cultural materials for analysis" (p. 36; see also Table 8). Because the foreign artefacts are limited to a subset of the cultural levels and because they are relatively few in number in comparison to the remainder of the artefact assemblage, this examination uses the cultural levels, rather than the analytic units presented by Graves *et al.* (2005), as primary units of analysis.

Table 1. Summary of features excavated at Nuʻalolo Kai.

Feature	Units	Max. depth (cmbs)*	No. cultural levels
K2	5	91.4	3
K3	93	251.5	8
K4	10	157.5	3
K5	52	177.8	9

* The original investigators (see Soehren and Kikuchi n.d.) reported depths in inches (in.). These depths have been converted here to centimetres (cm) for consistency with Graves *et al.* (2005).

Table 2. Cultural levels and depths (cm) below ground surface by feature, Nuʻalolo Kai.

Cultural level*	K3	K4	K5
Surface	0–7.5	–	–
I	7.5–30.5	0–25	0–26
II	30.5–51	25–56	26–39.6
III	51–76	56–106	39.6–50
IV	76–106.5	–	50–74.5
V	106.5–140	–	74.5–85
VI	140–178	–	85–99
VII	178–239	–	99–113
VIII	–	–	113–125
IX	–	–	125–137

* Although the three features have been listed together in this table due to space limitations, this is not meant to suggest that suggest there is a correlation, chronological or otherwise, between the numbered cultural levels within the three features.

Working from the data produced by the original excavators, the UH researchers modelled the site's settlement history. Feature K3, the terrace most extensively excavated by the Bishop Museum team, also produced deposits spanning the greatest length of time. Graves *et al.* (2005) interpreted the lowest two cultural levels as "Prehistoric", dating them to the period between AD 1250/1300 and 1500. Features K3 and K5 both yielded "Late Prehistoric" deposits dated between AD 1500 and 1700. Based on an increasing proportion of domestic artefacts, Graves *et al*. postulated that use of the site gradually became more intensive through time. They suggested that Feature K3, initially used for cooking and tool manufacturing, had transitioned into a space for permanent habitation by Level III (Graves *et al*. 2005: 167). In Feature K5, they argued that Levels I and II both represented "living area[s]" (Graves *et al*. 2005: 180).

From the earliest investigations at the site, which yielded "china dishes" (Bennett 1931: 149), it was clear that the terraces contained a post-contact component. The UH analysis revealed that the terraces were continuously occupied from the pre-contact through the post-contact periods. Based on the presence of foreign objects, the UH researchers considered the upper three

cultural levels in Features K3 and K5 "Historic." Feature K4 was thought to have been the most recently constructed of the three main terraces, although it has not been radiocarbon dated (Graves *et al*. 2005: 185). The draft report produced by the original investigators suggested that the stone alignments visible on the surface were the remains of grass-thatched dwellings, which were presumed to date to the post-contact period (Soehren and Kikuchi n.d.). Thus, the foreign artefacts not only derive from the uppermost surface architecture but also extend into the site's deeper cultural levels.

The site's continuous occupation from the pre-contact into the post-contact period and its remarkable preservation offer a unique opportunity to investigate aspects of change and continuity in Hawaiian households from the early post-contact period to the mid-nineteenth century. While the UH researchers listed historic artefacts with known proveniences in their published inventory (Graves *et al*. 2005), the foreign artefacts from Nuʻalolo Kai were not subjected to detailed analysis at the time. The present analysis was aimed at enhancing chronological and cultural understanding of the site's settlement history and investigation into questions relating to the historic activities at Nuʻalolo Kai.

REVIEW OF THE FOREIGN ARTEFACTS

The 386 foreign artefacts from the 1958–1964 Bishop Museum excavations are summarised in Table 3. The foreign artefacts from K3 derive from Levels I–IV, while those from K4 derive from Levels I–II and those from K5 come from Levels I–VII. The foreign artefacts comprise a variety of materials, including metal objects, small ornaments, cloth and buttons, glass and miscellaneous artefacts.

Metal Objects

The largest group is metal artefacts, the majority of which are highly oxidised and unidentifiable pieces of iron or ferrous metal. The metal artefacts include 13 iron fasteners, including iron nails, several of which were machine-cut, and a flathead wood screw that appears to have a self-starting gimlet point. Thirteen pieces of copper sheeting were also collected from the site. Copper alloy or brass fasteners include a spike and several small nails or tacks.[2] Several brass fasteners resemble the sheathing tacks used to attach copper sheathing to the bottom of wooden ships, a practice that originated in the latter part of the eighteenth century (McCarthy 2005: 102). Five metal fishhooks were present, four of which appear to be modified iron nails. While highly rusted, these fishhooks resemble the traditional styles and sizes of Hawaiian fishhooks made from bone and pearl-shell. The other metal fishhook was manufactured from copper alloy (Fig. 5). The assemblage also includes two musket balls, one of which may have been reshaped to form a lead sinker, two flint strike-a-lights and one gunflint.

Figure 5. Metal fishhooks recovered from Nu‘alolo Kai. The four on the left are iron fishhooks that may have been manufactured from modified nails. The fishhook on the right is made of copper alloy.

Table 3. Foreign artefacts from Nu‘alolo Kai.

Category	Subcategory	K3	K4	K5	Unknown	Total
Metal	Brass nail/tack	3	2	3	1	9
	Brass spike		1			1
	Copper sheeting	4	3	4	2	13
	Iron chisel	1				1
	Iron knife haft			1		1
	Iron nail, machine-cut	2		3	1	6
	Iron nail, unidentifiable			4	2	6
	Iron slotted-head wood screw		1			1
	Iron (bent-nail) fishhook	2		1		3

Category	Subcategory	K3	K4	K5	Unknown	Total
	Copper fishhook			1		1
	Musket ball			2		2
	Unidentifiable/other copper	2		3		5
	Unidentifiable/other iron	20	4	62	14	100
Flint	Gunflint	1				1
	Strike-a-light	1			1	2
Beads and ornaments	Glass bead, blown	1				1
	Glass bead, drawn	1	28	2		31
	Glass bead, faceted		1	1		2
	Glass bead, unidentifiable	14		1		15
	Glass bead, wound	3	5	17		25
	Unmounted gemstone, leaded glass	1				1
	Comb, turtle shell	1		5		6
Ceramics	Porcellaneous stoneware	1				1
	Porcelain, underglaze blue	6				6
	Porcelain, underglaze blue with red			2		2
	Pearlware, shell-edged			1		1
	Whiteware			2	1	3
	Whiteware, green transfer-print		4			4

Category	Subcategory	K3	K4	K5	Unknown	Total
	Yellowware	3				3
Bottle glass	Amber glass	1				1
	Olive-green glass	10		2	5	17
Flat glass/ mirror parts	Flat glass, assorted	9	1			10
	Mirror fragment?	1		1		2
	Mirror frame, wood	2				2
Buttons	Button, bone	1				1
	Button blank, bone			1		1
	Button, brass with anchor motif	1				1
	Button, ivory?			1		1
	Button, Prosser	1		1		2
	Button, shell	1				1
	Button, turtle shell			2		2
	Button blank, wood/ coconut shell	1				1
Fabric	Cloth fragment, plain-weave	11	8	55		74
	Cloth wick, plain-weave			2		2
	Cloth fragment, twill-weave			4	1	5
	Shoe sole, leather	2				2
Slate	Slate pencil	1		2		3

Category	Subcategory	K3	K4	K5	Unknown	Total
Printed paper	Page, Hawaiian-language Bible	9	1	1		11
	Match wrapper	1				1
Misc.	Glass fragment, unidentifiable	1				1
	Wire insulation, fibreglass?				1	1
	Bottle cap, crown cap				1	1
Total		120	59	187	30	396

Ornaments

Glass beads are another common artefact. Undecorated monochrome beads in wound, drawn and faceted varieties dominate the glass bead assemblage. Five Cornaline d'Aleppo or "white heart" beads are present (Fig. 6). These compound beads, which have a layer of glass overlying a white core, were manufactured in several European beading centres and used as trade beads throughout Africa and North America. They eventually became known as "Hudson's Bay" beads because the Hudson's Bay Company frequently used them in the fur trade (Ross 1990: 44). Thirty-one small beads were collected from a single provenience in Feature K4; several are still strung on fibre cordage. Researchers have hypothesised that glass beads were the focus of an informal exchange economy involving foreign men and Hawaiian women, who strung them as ornaments in a similar fashion to shell beads (Kirch 1992: 181). The assemblage also includes a blue-coloured gemstone identified by XRF analysis as leaded glass, also known as crystal.

Other objects related to personal adornment include turtle-shell combs. Both men and women used combs of turtle shell during the nineteenth century for grooming their hair, and women wore them in their hair as decorative items (Sherrow 2006: 92). A total of six undecorated combs or comb fragments are present in the assemblage. These objects, along with the turtle-shell buttons, may represent foreign trade items. The Nu‘alolo Kai house sites yielded pieces of modified turtle shell consistent with the production of turtle-shell items (Graves *et al.* 2015: 68–70). As a result, the possibility exists that at least some of these objects were manufactured locally.

Figure 6. Glass beads from Nu‘alolo Kai. Top: 31 small beads found together; bottom: four Cornaline d’Aleppo beads.

Cloth and Buttons

The cloth fragments represent natural materials such as cotton, wool, silk and bast.[3] Most are plain-weave cloth, although several twill-weave specimens are also present. Several items are stitched, most frequently with cotton thread. While most of the fabric fragments are uncoloured, several pieces are a dark blue, consistent with natural indigo. A small number have simple printed designs. Several fragments decorated with floral motifs were present, as well as one specimen with an open-plaid discharge-printed design (Fig. 7). In the discharge printing method, first used around 1800, fabric was dyed with indigo and then “printed” with a bleaching agent (Brackman 2008: 20). This discharge-printed fragment was stitched to an undyed cotton fragment; the undyed fragment may represent a cotton lining attached to a piece of printed fabric. Because nineteenth-century cloth garments were frequently lined, the presence of the undyed fabric may indicate that this piece represents part of a garment.

While some of the fragments may derive from garments, it is possible that others represent household objects such as blankets or bags. Two pieces of foreign cloth were twisted into a two-ply formation typical of Hawaiian twining known as an S-twist. The original excavators (Soehren and Kikuchi n.d.) suggested these items, virtually identical to 13 kapa wicks also recovered from the site, were used as wicks for traditional Hawaiian stone lamps filled with *kukui* ‘candlenut’ (*Aleurites moluccana*) or *kamani* ‘laurelwood’ (*Calophyllum inophyllum*) oil. Two fragments of a leather shoe or boot sole with small nail holes along the edges are also present. The small size of the leather fragments suggests that this piece of footwear may have belonged to a woman.

Figure 7. Fabric fragments from Nu‘alolo Kai. Top: Discharge-printed fabric with open-plaid design and undyed cotton lining; bottom: wicks made from foreign fabric.

The ten buttons collected from Nuʻalolo Kai are of a variety of materials, including bone, shell, brass, coconut shell or wood and what appears to be turtle shell. The collection also includes two Prosser buttons, which are small white porcelain buttons often used as shirt buttons (Sprague 2002). Other buttons are similar in size to pants or coat buttons. One bone button and one button the original excavators identified as coconut shell are blanks or single-hole buttons originally covered with cloth. One two-piece brass button embossed with the image of an anchor was also found. While these buttons may have once been attached to pieces of clothing, loose buttons were also a common trade item in the early post-contact period and served as ornaments in much the same way as glass beads (Carter 1990: 39).

Ceramics

The small number of ceramic sherds represent several ware types, including porcellaneous stoneware, porcelain, yellowware and whiteware (Fig. 8). The assemblage contains one fragment of Kitchen Ch'ing Chinese porcellaneous stoneware that possibly derived from a rice bowl (Susan Lebo, pers. comm., 2019).

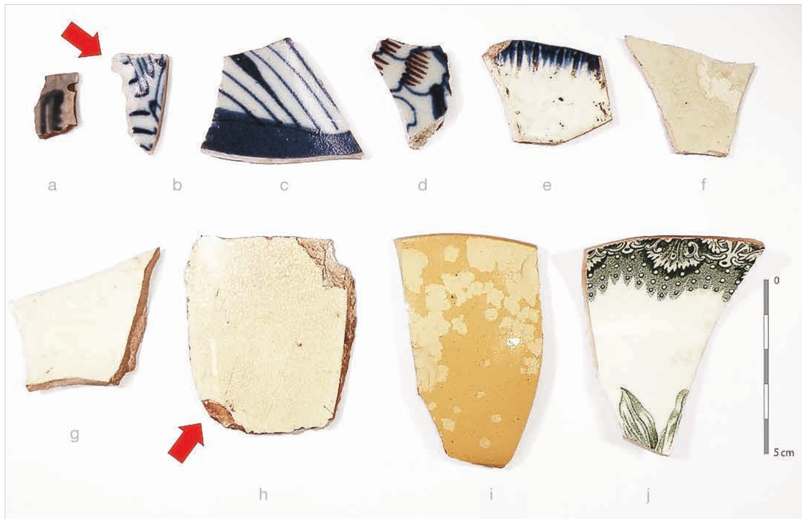

Figure 8. Ceramic artefacts from Nuʻalolo Kai, including a) porcellaneous stoneware, b–d) porcelain, e) shell-edged pearlware, f–h) whiteware, i) yellowware and j) whiteware with green transfer-printed design. Arrows indicate worked edges.

Seven pieces of Chinese porcelain were present, which have both underglaze blue and underglaze blue and red hand-painted designs. Underglaze designs are painted on the surface of the pottery before the glaze is applied. At least three distinct porcelain vessels are present. Three sherds, including one rim sherd, with blue decoration have a pattern that resembles the "Allah" plate. The "Allah" plate, produced between the seventeenth and nineteenth centuries, often had chrysanthemums surrounded by an undulating freehand design. The wavy lines are thought to represent a stylised form of the word "Allah"[4] (Willets 1981: 3). The small porcelain fragments from Nu‘alolo Kai, while of indeterminate vessel form, are consistent in shape with a plate. One sherd with a red-and-blue peony design is a thick, flat sherd that probably derives from the base of a plate or serving bowl.

The ceramic assemblage also includes several fragments of refined earthenware, including pearlware, whiteware and yellowware. One sherd of blue shell-edged pearlware was found. At least three whiteware vessels are present, which included four pieces of a whiteware bowl with a green transfer-printed design and one additional undecorated whiteware sherd identifiable as a bowl fragment. Three sherds of at least one large, flat-bottomed yellowware bowl are also present. The yellowware bowl is oval or irregular in shape.

The ceramics assemblage also shows evidence for the reuse of these items for purposes other than those for which they were originally intended. One of the blue-on-white porcelain sherds shows prominent flaking along one margin, suggesting someone used it as a scraping tool; a whiteware sherd also shows marks from use as an implement and red staining of uncertain origin.

Bottles and Other Glass

Glass artefacts include both bottle glass and fragments of flat, clear glass. The bottle glass assemblage consists of 17 pieces of olive-green glass and an amber glass fragment. At least two round-bodied, mould-blown olive-green wine or ale bottles are present. While most of the glass fragments are too small to have diagnostic characteristics, the assemblage includes one partial hand-applied finish and two bottle base fragments, one of which is slightly indented and one that exhibits a steep kick-up. The term finish refers to the "mouth" or top of the bottle; hand-held finishing tools were commonly used by manufacturers in shaping this part of the bottle during a period lasting from approximately the 1820s to the 1920s (Jones *et al*. 1989: 43). The two base fragments show moderate wear, possibly associated with long-term use. The applied-finish fragment has been reshaped by flaking and shows wear on its margins (Fig. 9). Four additional bottle glass fragments show apparent evidence of sharpening or use-wear.

Figure 9. Modified hand-applied bottle finish fragment recovered from Nuʻalolo Kai. At left: exterior of finish; at right: modified interior.

One flat glass artefact has a bevelled corner and a narrow band along the edge that appears to have been left by a frame. Two flat glass fragments have a metallic residue shown by XRF analysis to contain traces of tin, suggesting that these glass fragments represent parts of mirrors. Two wooden objects identified by the original excavators as mirror "holders" or frames were recovered from Feature K3. Historical accounts suggest that mirrors, frequently brought to Hawaiʻi in the early post-contact period as trade items, were highly prized by Hawaiian women (Linnekin 1990: 175).

Slate Pencils and Printed Materials

Several artefacts may have connections to the work of the missionaries in Hawaiʻi. While mission-based studies are uncommon in Hawaiʻi, archaeologists have studied the work of missionaries across Oceania (Flexner 2016; Lydon 2009; Middleton 2009). Three slate pencils were found at Nuʻalolo Kai, two of which are encased in feather quills (Fig. 10). The pencils each show wear on one end, suggesting they may have been used. Slate pencils and writing tablets have previously been linked to the arrival of Christian missionaries in 1820 (e.g., Kirch 1992: 181; see also Rosendahl and Carter 1988: 51). Because slate pencils were used aboard ships, however, it is possible they were exchanged with Hawaiians prior to the missionary period.

The assemblage also includes ten fragments of paper printed in the Hawaiian language. A search of recently digitised Hawaiian-language texts shows these pages, which contain Biblical passages from the Old Testament books of Joshua and Judges and the New Testament books of Matthew, Acts and Hebrews, are pages of the Hawaiian-language Bible. While the Hawaiian-language version of Matthew was first published in 1828, the entire New Testament, including Acts and Hebrews, was not printed until 1832. The complete Hawaiian-language Bible (*Baibala Hemolele*), including

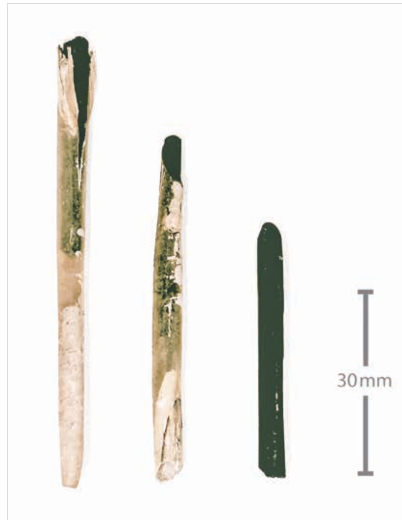

Figure 10. Slate pencils recovered from Nu‘alolo Kai. The two pencils on the left are encased in feather quills.

the Old Testament, was first printed in 1839 (Lyon 2017: 132–33; see also Day and Loomis 1997: 16). By the 1860s, many Hawaiians could read and write, and missionaries had widely distributed copies of the Bible and other religious tracts in the Hawaiian language (Anderson 1865: 259).

One final artefact in this category is a fragment of paper printed with an image of a six-storey city building. The front of the building has the lettering "BOSTON MATCH COMPANY ESTABLISHED 1835/BYAM CARLTON & CO'S FRICTION MATCH MANUFACTORY". The paper appears to represent a match wrapper produced by Byam, Carlton and Company and clearly postdates the founding of the company in 1835.

Summary and Implications

Analysis of the foreign artefacts from these layered household contexts, which represent multiple successive occupations, allow us to envision how the residents of Nu‘alolo Kai incorporated foreign goods as part of a few, selected everyday activities between the early post-contact period and the latter half of the nineteenth century. The artefacts suggest that the people of Nu‘alolo Kai adopted some elements of European-style dress, including shoes and possibly shirts or other garments. Glass beads and other ornaments, such as the cut-glass gemstone, would have been used by women

for personal adornment. Crockery and perhaps glass bottles appear to have been incorporated into household food service, while the presence of flint and musket balls may suggest the use of firearms. Matches, and perhaps flint, would have been used to start cooking fires. Metal implements, such as the chisel and knife, may have been used for various tasks such as woodworking or cutting; nails appear to have been reworked as fishhooks. Finally, the slate pencils and Bible pages are notable because they are potential indicators of literacy among the residents of Nuʻalolo Kai.

FOREIGN ARTEFACTS AND SITE CHRONOLOGY

Foreign artefacts provide chronological data that can help to date the site's post-contact deposits. The Nuʻalolo Kai foreign artefacts assemblage included several artefacts with temporally diagnostic characteristics. The unique characteristics of Nuʻalolo Kai, however, challenge conventional methods of using historic artefacts to date contexts. For example, the dating of archaeological components in historical archaeology often rests on multiple artefacts with chronologically diagnostic features. Techniques such as mean ceramic dating (MCD), a method that averages the ages of pottery fragments recovered from a specific context (South 1978), allow investigators to assign dates to individual contexts based on periods of ceramic manufacture. The Nuʻalolo Kai assemblage, in contrast, yielded few diagnostic artefacts. Another difficulty lies in the potential for these objects to have an associated time lag. One estimate for time lag between the production and deposition of ceramic artefacts in urban settings is 15 to 20 years or more (Adams 2003). Time lag in rural or remote areas such as Nuʻalolo Kai would likely have been considerably greater. For example, studies have suggested that residents of outlying areas often obtained "odd lots" containing out-of-date, mismatched vessels (O'Donovan and Wurst 2001).

As a result, I have focused on establishing *terminus post quem* (TPQ) dates for the post-contact cultural levels (see Garland 1996), with the assumption that the actual dates of occupation were likely somewhat later. Many of the site's artefacts, including mould-blown bottle glass and porcelain artefacts, for example, were consistent with an early- to mid-nineteenth-century period of occupation. Foreign artefacts from the assemblage with temporally diagnostic attributes are summarised in Table 4. Artefact depths were originally recorded in inches; for consistency with the analysis by Graves *et al.* (2005), however, I have converted these measurements to centimetres (cm).

A summary of chronological information pertaining to the cultural levels in the three primary features at Nuʻalolo Kai is shown in Table 5. This table includes data drawn from both the radiocarbon dates reported by Graves *et al.* (2005) and diagnostic foreign artefacts, which allow us to refine the radiocarbon chronology. The dates are presented in the table as TPQ dates, meaning that they

represent the earliest possible date for each level and, by extension, subsequent (higher) levels. The cultural levels with the clearest temporal associations are the uppermost proveniences in each feature. In Feature K3, the Surface level and Level I are considered together. The uppermost cultural levels in all three features contained artefacts providing TPQs in the late 1830s or the 1840s. However, the deposition of these items in the terraces may have been significantly later than the 1840s, given the potential time lag between when these materials arrived in the archipelago and their arrival in the hinterlands of Nuʻalolo Kai. I estimate that the 1860s to early 1870s is a likely time span for the residential activities represented in these cultural levels. This timeframe is consistent with historical information suggesting that the cliff-side terraces were no longer used as permanent residences by the mid-1870s.

Based on the presence of increased quantities of foreign artefacts, the UH team considered the first three cultural levels of Feature K3 and Feature K5 (Graves *et al.* 2005: 183, 184) as post-contact in origin. As shown in Table 5, additional foreign artefacts were recovered below those levels; when items spanning multiple cultural levels are considered (Table 6), this number increases. While Graves *et al.* (2005) interpreted the small quantities of foreign items below the "established" post-contact levels as intrusive, the presence of these artefacts lends some ambiguity to the identification of these proveniences as solely pre-contact. Besides signalling intrusion or disturbance, small numbers of foreign artefacts might indicate an initially slow period of introduction.[5] Thus, it may be productive to consider additional lines of evidence, such as floral and faunal remains or spatial data, in assigning a given cultural level to the pre-contact or post-contact period.

Even for the earliest cultural levels, considered by previous researchers (i.e., Graves *et al.* 2005) as definitively post-contact, the lack of artefacts with specific temporally diagnostic features unfortunately makes it impossible to date these proveniences precisely. Yet, the deep post-contact deposits at Nuʻalolo Kai offer insight into the chronology of these cultural levels. Cook's arrival in 1778 offers a TPQ date for the arrival of foreign artefacts in the archipelago,[6] although it was not until the 1790s that ships began to visit Hawaiʻi with regularity. In Feature K3, the uppermost three cultural levels account for 30 inches of soil deposition; in Feature K5, the top three levels account for 20 inches. These levels include multiple floors and occupation surfaces. The significant depth of these deposits allows us to infer that the arrival of foreign artefacts occurred several decades before the deposition of the uppermost cultural levels, which securely date to the mid-nineteenth century. Thus, the introduction of foreign artefacts is likely to have occurred relatively early in the post-contact period, i.e., by the early nineteenth century. Foreign objects continued to be used in small quantities until about the 1860s, or slightly later, through successive occupations of the site.

Table 4. Diagnostic foreign artefacts by feature.

Artefact type	Date range	K3	K4	K5	References
Wood screw, gimlet point	1846+		0–20 cm (I, *n*=1)		Miller *et al.* 2000
Prosser button	1840+ (widespread 1860s)	0–15 cm (I, *n*=1)		86 cm (VI, *n*=1)*	Sprague 2002
Pages of Hawaiian-language Bible (Old Testament, e.g., Joshua and Judges)	1839+		0–10 cm (I, *n*=1)	25–46 cm† (I to III, *n*=1)	Lyon 2017
Match wrapper	1835+	Unprov.‡ (*n*=1)			none
Pages of Hawaiian-language Bible (New Testament, e.g., Matthew and Hebrews)	1832+	0 cm (Surface, *n*=2) 10 cm (I, *n*=4) 15 cm (*n*=2) 20 cm (I, *n*=1)			Lyon 2017
Brass button with anchor motif	ca. 1830–1865	0–46 cm (Surface to II, *n*=1)			Olsen 1963
Cornaline d'Aleppo bead	1830+	0–43 cm (Surface to II, *n*=1)	0 cm (I, *n*=2) 10–15 cm (I, *n*=1)	8 cm (I, *n*=1)	Francis 1988
Green transfer-print design	1828+		0–15 cm (I, *n*=4)		Aultman *et al.* 2003

Artefact type	Date range	K3	K4	K5	References
Yellowware	1825–early 20c.	Unprov. (*n*=1) 0–15 cm (Surface to I, *n*=1) 30 cm (I, *n*=1)			Aultman *et al.* 2003
Whiteware	1820+			Unprov. (*n*=1) 15–20 cm (I, *n*=1)	Aultman *et al.* 2003
Machine-cut nail	1810+	0–23 cm (Surface to I, *n*=2)		25–46 cm (I to III, *n*=2) 36–46 cm (II to III, *n*=1)	Wells 1998
Shell button with sunburst design	ca. 1800–1865	20 cm (I, *n*=1)			South 1964
Shell-edged pearlware	ca. 1800–1830			0–36 cm (I to II, *n*=1)	Aultman *et al.* 2003

* The field notes show this button as being recovered adjacent to a “soft hole”; thus, this artefact is considered to have been moved from its original context.

† Some artefacts were provenienced to quite general depth ranges and could not be assigned to specific cultural levels (see discussion of excavation methodology above); the Roman numerals in parentheses indicate the cultural levels associated with a given depth range.

‡ The “unprovenienced” designation signifies that no information regarding vertical provenience (depth) of the artefact was recorded by the original excavators.

Table 5. Estimated terminus post quem (TPQ) dates for cultural levels in each feature, based on diagnostic foreign artefacts and radiocarbon dates reported by Graves *et al.* (2005).

Cultural level	Feature K3		Feature K4		Feature K5	
	No. foreign artefacts	Estimated TPQ	No. foreign artefacts	Estimated TPQ	No. foreign artefacts	Estimated TPQ
I	43*	1840 (ca. 1860s)	51	1846 (ca. 1860s)	27	1839 (ca. 1860s)
II	14	Early 19c.	2	Late 18c.–early 19c.	5	Early 19c.
III	17	Late 18c.–early 19c.	–	Undated	6	
IV	1	**AD 1482–1815†**	–	Undated	8	Late 18c.–early 19c.?
V	0		–	Sterile	2	**AD 1634–1890†**
VI	0	**AD 1297–1431†**	–	n/a	1	
VII	0		–		2	
VIII	–	Sterile	–		0	
IX	–	n/a	–		0	**AD 1645–1889†**
–	–		–		–	Sterile

* The shaded boxes indicate the cultural levels interpreted by Graves *et al.* (2005) as representing cultural intervals that date to the post-contact period. Note that in five cases, levels with small amounts of historic material were assigned by Graves *et al*. to the pre-contact period. While Graves *et al.* (2005) placed Level IV in the pre-contact period of their chronological model, elsewhere they note that it may have spanned the mid- to late seventeenth century, i.e., the period of European contact.

† The calibrated radiocarbon date ranges (in bold) are from Graves *et al.* (2005: Table 7). The samples from Feature K3 were collected from units within Feature K3b. The calibrated ranges provided in the text have no accompanying information such as the calibration curve used or calibration error. With the exception of a date from Level VIII in Feature K5, conventional radiocarbon ages (CRAs) are not included. The sampled material consists of unidentified wood charcoal.

Table 6. Foreign artefacts with depth ranges incorporating more than one cultural level.

Associated cultural levels	K3a	K3b	K5a
Surface	–	2	–
Surface to I	1	15	–
Surface to II	1	6	–
Surface to III	2	1	–
I	1	21	27
I to II	–	5	27
I to III	1	6	15
II	2	12	5
II to III	–	1	16
II to IV	–	–	16
II to V	1	–	–
III	–	17	6
III to IV	–	1	3
III to V	–		4
IV	–	1	8
IV to VI	–	–	1
V	–	–	2
V to VII	–	–	1
VI	–	–	1
VI to VII	–	–	3
VII	–	–	2
VII to IX	–	–	1

CHANGE THROUGH TIME

Feature K3, the most extensively excavated terrace, most clearly demonstrates an increase in the frequency of foreign artefacts through time (Table 7). As noted above, the only foreign artefact recovered from Level IV was a glass bead. Levels II and III of Feature K3 contained slightly higher numbers of foreign artefacts, with little difference observed between the two. The Surface and Level I, considered here together, yielded a significantly higher number of foreign artefacts. Yet, the percentage of foreign artefacts compared to the total artefact collection remains below 10 percent. This proportion is quite small, particularly in comparison to similar data from Anahulu Valley, where house sites first occupied after the 1830s were dominated by foreign artefacts (Kirch 1992).

Table 7. Foreign artefacts from the top four cultural levels of Feature K3b.

Cultural level	Depth (cmbs)	Estimated TPQ	Foreign artefacts	Percent total
Surface	0–7.5	1840	39	9.2
I	7.5–30.5	1832		
II	30.5–51	–	12	3.9
III	51–76	1778	17	4.2
IV	76–106.5	1778?	1	0.3

It is also possible to examine changes in the foreign artefacts from Feature K3 in terms of the types of objects represented in the assemblage. Table 8 shows the artefacts collected from discrete cultural levels. While the sample of artefacts is small, a few patterns are noticeable. The objects recovered from the earliest post-contact deposits in Feature K3 included glass beads, lengths of plain-weave cloth, porcelain fragments, a copper nail, a slate pencil and several unidentifiable iron fragments. Such objects are roughly consistent with the types of objects that sea traders carried in the early post-contact period specifically for trade with Hawaiians and other indigenous groups. It is notable that Carter's (1990) review of early post-contact sites showed that such trade goods were best represented at sites associated with high-status Hawaiians.

Table 8. Foreign artefacts by cultural level (Surface/I–IV) in Feature K3.*

Artefact category	Artefact type	Surface/I	II	III	IV	Total
Glass	Bottle glass, olive-green	2	–	–	–	2
	Flat glass	1	2	–	–	3
	Unidentifiable glass fragment	1	–	–	–	1
Ceramics	Yellowware	1	–	–	–	1
	Porcelain, underglaze blue	–	1	1	–	2
Metal	Nail, iron, machine-cut	2	–	–	–	2
	Nail, copper alloy	1	–	1	–	2
	Sheeting, copper alloy	3	–	–	–	3
	Bent-nail fishhook, iron	–	–	1	–	1
	Unidentifiable iron fragment	5	2	7	–	14
Beads	Bead, glass	6	2	1	1	10
Cloth	Plain-weave cloth	5	–	3	–	8
	Shoe sole fragment, leather	–	2	–	–	2
Buttons	Button, Prosser	1	–	–	–	1
	Button, shell	1	–	–	–	1
	Button, bone	1	–	–	–	1
	Button, coconut shell	–	1	–	–	1
Ornaments	Gem stone	–	1	–	–	1
	Turtle-shell comb	1	4	–	–	5
Writing tools and paper	Hawaiian-language Bible page	9	–	–	–	9
	Slate pencil	–	–	1	–	1
Total		40	15	15	1	71

* Artefacts from both K3a and K3b are included in these totals.

The assemblage of foreign objects collected from the uppermost deposits of Feature K3, in contrast, included certain objects that may have represented a new, emerging version of the trappings of the Hawaiian household in the mid-nineteenth century. Ceramic artefacts from Level I included yellowware, an inexpensive utility ware, rather than porcelain. The presence of several types of buttons in Level I and Level II may relate to the increasing incorporation of western-style clothing. Because Level 1 contained several glass beads, it appears that residents of Nuʻalolo Kai continued to integrate such items into their wardrobes, along with other ornaments such as turtle-shell combs. The presence of Hawaiian-language Bible pages, together with slate pencils, suggests that despite living in a rugged and remote part of the archipelago the occupants of this house site may have been among the vast majority of Hawaiians who had acquired literacy by the mid-nineteenth century.

It is also informative to consider the types of traditional artefacts that are present in the post-contact cultural levels of Feature K3. There was little decrease in the frequency of artefacts made from traditional materials, even in the deposits from Level 1. Stone adzes continued to be present in the uppermost cultural levels, suggesting that the residents of Nuʻalolo Kai continued to use traditional stone tools for woodworking (see also Bayman 2014), along with several types of fishing equipment. Fishing gear from the upper levels comprised fishhooks and fishhook blanks of bone and pearl-shell, sinkers made from multiple materials, and octopus lures. Numerous coral and sea urchin spine files were also recovered, indicating that fishhook manufacturing also persisted. Numerous fragments of perishable materials, such as cordage, gourd containers and kapa, items used for various household purposes, were recovered from these contexts. Shell beads and dog teeth, pig teeth and niho palaoa (interpreted as pendants) from the upper cultural levels indicate that such materials also continued to be used for bodily ornamentation.

DISCUSSION

The Nuʻalolo Kai legacy collection allows us to examine a well-preserved, stratified residential site that Hawaiians occupied continuously from the pre-contact period until the latter part of the nineteenth century. While scholars have recommended that we eliminate false distinctions between so-called “prehistoric” and “historical” archaeology (e.g., Lightfoot 1995), this task has often been challenging to accomplish in practice. The materials from Nuʻalolo Kai provide an important case study for investigating material change and continuity in early post-contact Hawaiʻi. Nuʻalolo’s unique position as a remote community makes it possible to investigate questions about the variability of local responses to widespread social transformations in the archipelago.

Introduction of Foreign Goods

Foreign objects likely arrived at Nuʻalolo Kai through multiple types of circulation networks, including those furthered by the actions of both men and women. While Hawaiian elites initially tried to control the circulation of foreign goods, the frequent interaction between ships' crews and Hawaiian women made such regulations difficult to enforce. Ships' crews traded various types of objects for provisions, and, over time, many farming households began to produce surplus crops specifically for this purpose. It is possible that some items, particularly the copper alloy tacks and spike, may have been salvaged from shipwrecks, such as the *Bering* and the *Haʻaheo o Hawaiʻi*, that foundered off the coasts of Kauaʻi. Nuʻalolo Kai's status as a "way station" for canoe travellers, moreover, may have presented unique opportunities for its inhabitants to receive foreign goods in trade.

The uppermost cultural levels in the habitation features at Nuʻalolo Kai showed that foreign goods became increasingly available throughout the first half of the nineteenth century, perhaps due to the expansion of land-based exchange networks in which they could circulate. The arrival of the missionaries in 1820 and the opening of the sugar plantations in the 1830s made foreign goods significantly more accessible to the people of Kauaʻi, including those of Nuʻalolo Kai. Following the emergence of a land-based exchange network for foreign goods, these items could have arrived at Nuʻalolo Kai through trade with local missionaries or via barter at markets associated with the plantations or the ports. After entering intra-island exchange networks, such objects may have circulated widely; as a result, it is not clear whether residents of Nuʻalolo Kai obtained them directly through such interactions or via participation in informal exchange networks.

Foreign Goods in Nuʻalolo Kai Households

The earliest foreign artefacts were non-essential household goods such as glass beads and other small sundry items. These objects likely represent the products of trade with ships' crews, whether obtained directly or through intermediaries via local trade networks. It is possible that residents assigned the small foreign trade items that arrived at the site in the early post-contact period a high symbolic significance, recontextualising them as exotic luxuries or curiosities within the local sociopolitical structure. Some objects identified at Nuʻalolo Kai, including Chinese porcelain and porcellaneous stoneware, are associated with elite sites occupied during the early nineteenth century elsewhere. Carter (1990) demonstrated that during the early post-contact period foreign goods appeared primarily within the habitations of elite Hawaiians. The presence of such items in early post-contact contexts at Nuʻalolo Kai may suggest that if there were, in fact, high-status individuals or households here, their association with the community might have fostered the availability of foreign goods through various methods of exchange.

In contrast to the novelties and luxury items present in earlier contexts, the presence of inexpensive yellowware and whiteware ceramics in the uppermost deposits suggests that residents began to incorporate ceramic vessels into the household as domestic staples rather than luxury goods. Fragments of wine-style glass bottles also appeared in the most recent deposits. Yet, the presence of foreign objects in the site's uppermost cultural levels provides little evidence to suggest that foreign goods were being used or viewed in a manner consistent with that of a Euro-American household. While ceramics and glass bottles are typically the most common artefacts at most historical archaeology sites, both in Hawai'i and elsewhere, at Nu'alolo Kai, these items comprised only 38 artefacts, or 9.9 percent of the assemblage. The use of these items occurred as part of a distinctive framework for consumption, in comparison to that typically associated with historical artefacts. Whereas items such as bottle glass and ceramic artefacts are often found at historic sites in large numbers, as items easily purchased, at Nu'alolo Kai such objects may have played a more specialised role.

Rather than restructuring household activities, foreign items were in many cases fit into existing practices. In the nineteenth century, for example, ceramic vessels began to be used alongside wooden and gourd bowls to serve and store *poi* 'cooked and mashed taro root' and other liquid-based foods (see Garland 1996: 393; Kirch 1992: 182); Nu 'alolo Kai residents may have used the vessels found in the upper layers for similar purposes. Other objects have visible evidence of secondary use. Both porcelain and glass fragments, for example, show wear from use as cutting or scraping tools, while two pieces of foreign cloth were twisted to form kukui or kamani oil-lamp wicks. While a small number of nails were present, the quantities were too small to suggest they were used as building materials; instead, they may have been collected to produce bent-nail fishhooks such as the four iron hooks also recovered from the site.

Comparisons to Other Post-Contact Hawaiian House Sites

This study demonstrates that foreign objects arrived at Nu'alolo Kai early in the post-contact period. While such goods increased over time, by the latest period of occupation, ca. the 1860s–1870s, they only comprised a small proportion of the assemblage (i.e., less than 10 percent). This pattern contrasts with that seen at other Hawaiian residential sites in outlying areas, where a marked increase in foreign goods around the mid-nineteenth century was evident. Kirch's (1992) landmark Anahulu study, for example, showed that the integration of foreign artefacts into Hawaiian households expanded sharply after the 1830s, as the spread of the market economy in Hawai'i increased the availability of these objects across the archipelago. Rural Hawaiian house sites from the mid-nineteenth century and later have yielded a wide range of consumer goods, from metal implements to specialty food products, perfumes,

hair oil and pharmaceutical medicines (Anderson 2001; Flexner 2010, 2012, 2014; Flexner *et al.* 2018; Goodwin 1994; Kirch 1992; Mills *et al.* 2013).

Rather than showing a dramatic increase in the presence of foreign goods, the Nuʻalolo Kai assemblage suggests that residents of these house sites continued to use foreign goods in minimal numbers for nearly a century after the first arrival of Captain Cook in Hawaiʻi. In contrast, the nineteenth-century residents of Nuʻalolo Kai sustained many traditional provisioning strategies such as small-scale fishing and farming (see Field and Graves 2015) and may even have continued to use stone adzes and bone and shell fishhooks, despite the availability of newly introduced foreign alternatives. Nuʻalolo Kai's rugged and isolated setting created an unusual opportunity for Hawaiian households to preserve connections to ancestral lands without competition from industrial agriculture. Continuing to reside at Nuʻalolo Kai and maintaining subsistence ties to nearby lands while acquiring foreign items in limited quantities, these households chose to put many foreign goods to traditional purposes.

An important contribution of this study is that it demonstrates how minimal the representation of foreign goods can be at Hawaiian house sites occupied into the mid-nineteenth century. The cliff-side habitation terraces at Nuʻalolo Kai contained exceptionally well-preserved cultural deposits, where the excavators recovered many fragile objects in excellent condition. The small quantities of foreign goods in these deposits call into question the common practice in Polynesia of relegating sites that lack foreign artefacts to "pre-contact" and excluding portions of calibrated radiocarbon date ranges based on the absence of "historical" artefacts. As we have seen at Nuʻalolo Kai, sites may be post-contact in age but contain relatively few or no historic materials. This trend may be particularly problematic where preservation conditions are poor or sampling is especially modest. At post-contact Hawaiian sites with small sample sizes, it is quite possible that archaeological testing might not produce significant quantities of foreign artefacts until at least the post-1840 period, and possibly later. Rather than relying exclusively on the presence or absence of foreign goods, a multifaceted approach that considers artefacts in conjunction with changes in architectural styles (see Ladefoged 1991; Kirch 1992), or faunal and floral assemblages, might differentiate deposits from the post-contact period more reliably.

Further, this study also shows how critical it is to identify and describe foreign artefacts in detail, rather than simply noting their presence or absence. As many foreign objects have well-defined dates of production and/or introduction to the islands, including specific information on the characteristics and age of these artefacts can help to date deposits and, in some cases, to well-defined periods. Such information can assist archaeologists in dating site components; it can also enhance the comparability of these sites by placing them within a known historical context.

* * *

While Nuʻalolo Kai is one of the most well-known archaeological sites in Hawaiʻi, its potential for providing information about the early post-contact period has received little attention. The diverse and well-preserved assemblage of foreign artefacts in the Bishop Museum collection offers important information about the way the residents of Nuʻalolo Kai situated themselves in relation to the far-reaching changes of the nineteenth century. While regional variation in Hawaiʻi has become an important topic of research (e.g., Kirch 1990; Kirch *et al.* 2004), we still understand little about how transformations unfolded in diverse ways across the social landscape of post-contact Hawaiʻi (Flexner *et al.* 2018; Kahn *et al.* 2016). At Nuʻalolo Kai, small numbers of foreign goods, potentially obtained through a variety of exchange networks, were incorporated into household routines. Yet, their impact on domestic practices appears to have been minimal. Rather than exclusively signifying cultural change, these objects were, at times, incorporated into local routines in ways that signal a complex amalgamation of change and continuity.

Understanding the historical context of the Nuʻalolo Kai assemblage helps to counter the perception of change in Hawaiian culture in the post-contact period as a universal phenomenon and one that saw a transformation between two mutually exclusive cultural affiliations—pre-contact and post-contact. It allows us to consider instances of transformation, such as the use of foreign consumer goods, as resulting from the choices of individuals in unique circumstances. It suggests, moreover, that substantial variability in the presence of foreign artefacts may exist between household assemblages at post-contact Hawaiian house sites.

While the appearance of foreign goods at archaeological sites in Polynesia has often been interpreted as an indicator of sudden sociocultural transformations, the case of Nuʻalolo Kai demonstrates how the process of acquiring these objects could instead be gradual and complex. This unconventional trajectory of change highlights the potential for archaeologists to find complexity and diversity in processes of colonial-era transformation in Hawaiʻi and, potentially, the broader Pacific. Studies of post-contact-period habitation sites offer researchers the opportunity to emphasise the unique circumstances of local settings and to consider how these conditions shaped individuals' and households' incorporation of certain types of objects into daily routines.

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NOTES

1. The "K" numbers were originally site designations assigned by Bishop Museum. Subsequent researchers have considered the complex as a single site, with the K numbers retained as feature numbers.
2. Thirty-two artefacts, comprising primarily copper alloy artefacts, were submitted to Peter Mills at the University of Hawai'i at Hilo's Geoarchaeology Laboratory for X-ray fluorescence (XRF) analysis. Eleven copper artefacts are "near-pure" copper, a material commonly used in the early nineteenth century, while nine copper artefacts were identified as tin or zinc alloys more typical of the mid- to late nineteenth century (e.g., McCarthy 2005: 115).
3. The foreign fabric assemblage was analysed in collaboration with the Textiles Conservation Laboratory of the Colonial Williamsburg Foundation (CWF) in Williamsburg, Virginia. Textile identifications were made by Gretchen Guidess and additional historical information was supplied by CWF Associate Curator of Costume and Textiles Neal Hurst.
4. This design has also been referred to as the "Starburst" design (e.g., Ball 1995: 115).
5. With the exception of one artefact recovered from Level VI in Feature K5, temporal characteristics of the artefacts recovered from the site's lower levels are consistent with an early post-contact chronology. The one exception is a Prosser button, an item that clearly dates to the mid-nineteenth century or later (Sprague 2002). The original excavators described this item as being collected from a "soft hole", which explains it being out of sequence.
6. There is evidence that foreign objects, predominantly iron, reached Hawai'i before Cook's arrival, either in the hands of unrecorded previous visitors or as flotsam (e.g., Stokes 1931). Still, Cook's 1778 visit is the earliest date that such objects are likely to have arrived in numbers great enough to be captured in the archaeological record.

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