New Discoveries of Archaeological Sites with Polynesian Plainware Ceramics on Tutuila Island, American Samoa

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By Joel D. Klenck\(^1\) and Epifania Suafo’a-Taua’i\(^2\)

Introduction

Archaeologists from the American Samoa Historic Preservation Office (“ASHPO”) and American Samoa Power Authority (“ASPA”) excavated and analysed cultural assemblages from three sites: Maloata, Fagamalo, and Leone, on Tutuila Island, in American Samoa. All sites were excavated to comply with the National Historic Preservation Act of 1966 (“NHPA”), as amended. The Act requires all federally funded projects to record and mitigate damage to historic sites, usually greater than fifty (50) years of age. The ASPA Archaeology Department (“AAD”) and ASHPO also requires construction crews to follow the American Samoa Coastal Management Act of 1990 (“ASCMA”) and adhere to the provisions of the Samoan Project Notification and Review System (“PNRS”), which further protects historic sites.

\(^1\) Principal Investigator, Senior Advisor, President, PRC, Inc. (Contract Archaeology Firm); Former Territorial Archaeologist, American Samoa Historic Preservation Office, 6800 Bird Road, Ste. #381, Miami, Florida, 33155; Telephone: (904) 444-1576.

\(^2\) Principal Investigator, Senior Advisor, Director, Archaeology Department, American Samoa Power Authority, P.O. Box 2175, Leone Village, Pago Pago, American Samoa; Telephone: (684) 699-2316.
To fulfil the requirements of the NHPA, archaeologists completed Phase I, II, and III mitigation activities at Maloata, Fagamalo, and Leone, sites on or near the western coastline of Tutuila Island. Archaeological methods at these locales comprised pedestrian surveys, mitigation of shovel-test pits, excavation of square-metre excavation units, and dry sieving using quarter-inch mesh screens.

Archaeologists retrieved an array of artifacts including Polynesian Plainware ceramic sherds, adzes, adze pre-forms, volcanic glass, lunate-shaped lithic artifacts, debitage, a lithic denticulate, fire-cracked rocks, clays annealing to basaltic cinders, clays of various colours, and circular stone features. The retrieval of ceramic artifacts at these sites indicates ceramic utilization was more widespread than previously recorded and the potential presence of pottery making facilities at Fagamalo and Maloata.

**Background**

Archaeological research in the Pacific documented a rich and varied record of human occupation in Samoa between 2900 and 2700 cal BP (Addison & Matisoo-Smith 2010; Rieth & Hunt 2008). However, some dates suggest an earlier chronology, for the initial occupation of Tutuila, between 3400 and 2750 cal BP (Rieth et al. 2014). The first published archaeological field study was by Jack Golson (1969; 1972). Later archaeological research included several large projects in both Western and American Samoa (Green & Davidson 1965; Green & Davidson 1969; Green & Davidson 1972; Kirch & Hunt 1993).

The Samoan archipelago has been of great interest to Pacific researchers, especially after the retrieval of ancient ceramics by Golson (1969) and later by Green and Davidson (1972; see Figure 1). It was not until Green’s work that a more complete sequence of Samoan ceramics began to emerge (Green 1974). Green proposed a ceramic sequence for Upolu that was quickly embraced by Oceanic archaeologists and now stands as the conventional culture-historical reconstruction for the entire archipelago (Bellwood 1979; Davidson 1987; Kirch 1986; Kirch & Hunt 1993).
Early work in American Samoa was limited and focused mostly on regional scale settlement patterns and chronology. Notable works include the archaeological survey of surface artifacts by Kikuchi (1964) and test excavations by Janet Frost (1978). Subsequently, studies of Polynesian occupations began at Manu’a (Hunt 1987; Kirch & Hunt 1993; Clark & Michlovic 1996) and the western end of Tutuila (Ayres & Eisler 1987) including the archaeological excavations at the Tataga-Matau Adze Quarry (Leach & Witter 1990).

Evidence for early settlement and human occupation in Samoa, dating between ca. 3,000 to 2,000 years ago, comes from the Mulifanua Ceramic Site or Ferry Berth Site, which is approximately 800 metres from the western side of Upolu Island (Green & Davidson 1972; Green 1974; Leach & Green 1989). In eastern Tutuila, early occupation sites include the Aoa Valley Site (Clark 1989; Clark & Herdrich 1988, Clark & Herdrich 1993, Clark & Michlovic 1996). Also excavated was the To’aga Site that is located on a relatively narrow coastal flat on Ofu Island in the Manu’a Group (Kirch & Hunt 1993; Kirch et al. 1989; Kirch et al. 1990). These sites yielded early ceramics, including decorated Lapita pottery, from Mulifanua Village, and Polynesian Plainware. The term Polynesian Plainware was proposed by Green (1974), and later became popular term used by Hunt (1987), Clark and Michlovic (1996), and in later
studies (Eckert 2006). Several sites on Upolu, Manono and Apolima islands in Western Samoa also date to this early Polynesian Plainware period (Clark, Sheppard, & Jones 1997; Clark, Wright, & Herdrich 1997).

The general academic consensus is that Polynesian Plainware ceramic sites ended sometime around 1700 BP (Kirch 1986; Addison et al. 2006; Addison et al. 2008). This disappearance or decline of ceramics in American Samoa is documented at the To'aga Site (Kirch & Hunt 1993) and at Aoa (Clark & Michlovic 1996). Potential causes for the cessation of ceramic use in Samoa include transitions in function; the development of new technology, especially umu ovens that did not require ceramic material; the influx of new populations into American Samoa; cultural transitions that lessened the availability of ceramic specialists; or a combination of aforementioned factors.

From 2011 to 2013, excavations at the Vaota Lodge Site on Ofu Island exhibited complete ceramic pots shaped like ‘ava bowls (Clark 2013). During the 2013 season, excavators retrieved a complete but deteriorated ceramic vessel with eight basaltic ‘umu rocks with the remains of a black sea urchin inside the container. Recent discoveries of Polynesian Plainware sherds at western sites on Tutuila Island, specifically at Maloata, Fagamalo, and Leone, evidence the island-wide distribution of ceramics (Suafo’a-Ta’au’i & Klenck. 2013; Suafo’a-Ta’au’i & Klenck. 2014; and Klenck & Suafo’a-Ta’au’i 2014).

**Archaeological Methods**

At Maloata, Fagamalo, and Leone, on Tutuila Island, in American Samoa, archaeologists employed standard archaeological methods to ensure cultural material was properly acquired (see Figure 2). These methods included pedestrian surveys (Phase I), shovel test pits (Phase II), and one-metre square excavation units (Phase III). All excavated areas were mapped using a global positioning satellite (“GPS”) device, compass, and measuring tape, and were plotted to scale on a map. Photographs were taken of excavation units and archaeological features.
Archaeologists recorded level and feature forms, stratigraphic profiles, and feature drawings during the excavation of each unit. Plan views and profiles were drawn to scale of each cultural or natural subsurface feature. Depths were recorded as centimetres below the datum (“cbd”). Archaeology teams screened all excavated soil through quarter-inch mesh.

The size of the archaeological crews differed with each excavation: five at Maloata, six at Fagamalo, and nine at Leone. At each site, excavations of features were led and conducted by archaeologists having between thirty-three and nine years of archaeological experience.

The number of one-metre square excavated units at each locale varied: four at Maloata, eight at Fagamalo, and nine at Leone. At each site, crews excavated between 30 to 183 centimetres below the datum (“cbd”) until no cultural remains or archaeological features were visible or retrieved from screened debris. At Leone the datum was positioned in the southeast corner of the excavation units. At Fagamalo the datum was positioned in the northwest corner because of the severely sloping ground. Similarly, at Maloata, because of the differing elevations of the excavation units on the side of the road, archaeologists established two datum points on the northwest and northeast corners of the excavation units.
Surface reconnaissance was extended from fifty to one-hundred metres surrounding the excavation units. In addition, the crews excavated two and four shovel-test pits (“STPs”) at Maloata and Fagamalo, respectively. At Leone, archaeologists transitioned from Phase I reconnaissance surveys to a Phase III excavation because the midden layer, the floor from a prehistoric *fale*, was visible from a natural profile caused by tidal activity.

All cultural materials were placed in plastic bags noting their provenience, locus, stratum, depth measurements, date, and excavators. In addition, the location and presence of major artifacts were recorded in field books. At the conclusion of the excavation, field crews transported all artifacts to the ASPA laboratory or ASHPO. Here, the artifacts were washed, sorted, measured, photographed, and analysed.

In addition, soil samples and charred materials (retrieved in tinfoil) were collected from each stratum and transported to the two offices. Charred samples were sent to laboratories at the University of Georgia or Beta Labs in Miami, Florida, for radioisotope analysis.

The three sites of Maloata, Fagamalo, and Leone represent a range of typologies: a disturbed cultural assemblage impacted by modern construction efforts, a multi-purpose utilitarian site, and a *fale* or habitation, respectively.

**Maloata**

The goal of the archaeological survey and excavations at Maloata was to mitigate the loss of archaeological assemblages caused by a water pipe installation project. The project was partially funded by the Federal government and was therefore subject to Section 106 requirements of the NHPA.

The cultural assemblage at Maloata represented the remains of artifacts heavily impacted by natural precipitation, water runoff, and modern construction. No archaeological features or
cultural strata were identified or preserved. Also, the site remains undated: A possible charred artifact displayed contamination from modern carbon.

The first archaeological work performed in Maloata village was carried out Ayres and Eisler (1987). There, archaeologists conducted surface surveys and excavated seven test units, at twenty-metre intervals, in an east-to-west direction. In December, 2005, preliminary survey and field work at Maloata was conducted by Suafo’a-Taua’i and Tautala Asaua. In August, 2006, the ASHPO recommended monitoring and Phase III mitigation at the nearby Fish Farm site because a modern pipeline project would affect the area (Suafo’a-Taua’i 2007). The report for this archaeological assemblage at Maloata was submitted to the ASHPO in December of 2013 (Suafo’a-Taua’i & Klenck 2013).

In September, 2011, ASPA archaeologist monitoring construction efforts identified three (3) pottery sherds of Polynesian Plainware. Excavators retrieved another sherd from an excavation unit. Archaeologists halted the construction work and contacted the ASHPO, who recommended that archaeologists excavate four (4) square-metre units along the north side of the dirt road, west of Maloata Stream (Figure 3).

Figure 3: Location of the archaeological assemblage at Maloata, Tutuila Island, American Samoa.
The surface reconnaissance at Maloata was extended another fifty (50) metres outside the excavated area. In addition, the crew excavated four (4) shovel-test pits ("STPs"). These efforts revealed no additional cultural remains.

<table>
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<tr>
<th>Artifact Type</th>
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<tbody>
<tr>
<td>Ceramic Non-Rim Sherds</td>
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<td>Retouched / Total Basaltic Flakes</td>
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<tr>
<td>Adze Preforms</td>
<td>22</td>
</tr>
<tr>
<td>Complete or Broken Adzes</td>
<td>20</td>
</tr>
<tr>
<td>Basaltic Scraper</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 1: Artifacts Retrieved from the Maloata Waterline Site.**

Despite the heavily disturbed nature of the archaeological assemblage, the retrieved remains were noteworthy (See Table 1). From Maloata, archaeology crew retrieved four (4) ceramic sherds of Polynesian Plainware, twenty-two (22) basaltic adze preforms, twenty (20) complete or broken adzes, and one (1) basaltic scraper. The lithic debitage consisted of 2,322 basaltic flakes. Fifty-five (55) specimens from this total indicated re-touched flakes (Figure 4).

![Figure 4: Lithic adzes and Polynesian Plainware sherds from Maloata.](image-url)
In addition, archaeologists recognized two types of unique artifacts in the excavation units. First, archaeologists retrieved lunate-shaped debitage or untreated lithic material. Second, excavators collected sixteen (16) basaltic cinders and two bags of other times of cinders with hardened clay material annealed to the artifacts (Figure 5). These types of artifacts were collected due to an intuition by Suafo’a-Taua’i that they might be of cultural significance. These artifacts were subsequently observed during the Fagamalo excavation.

![Image of artifacts](image.jpg)

**Figure 5: Cinders with hardened clay material annealed to the surface and lunate-shaped debitage.**

Although cultural features of the Maloata site were most likely destroyed by modern construction, the excavation at Maloata represented the first discovery of Polynesian Plainware ceramics in western Tutuila.

**Fagamalo**

Similar to Maloata, the objective of archaeological survey and excavations at Fagamalo was to mitigate the loss of archaeological assemblages impacted by the emplacement of a water storage facility. The project was partially funded by the Federal government and was therefore subject to Section 106 requirements of the NHPA.
Closest to Fagamalo were the excavations at Maloata Village by Ayres and Eisler (1987), the fish farm at Maloata Village by Suafo’a-Taua’i (2007), and the salvage excavation at Maloata in this report (Suafo’a-Taua’i & Klenck 2013). Of note is that Suafo’a-Taua’i and two other archaeologists excavated Fagamalo seven months after Maloata and were cognizant of material assemblage from the latter locale. The report for the Fagamalo site was submitted to the ASHPO in January of 2014 (Suafo’a-Taua’i & Klenck 2014).

During a pedestrian survey in May, 2012, archaeology crews discovered six ceramic sherds on the slope of a hill with basaltic debitage, fire-cracked rocks, an adze preform, a broken adze, and a grinding stone. Subsequently, archaeologists excavated eight one-square-metre units to cover the area where the ceramic material was found, on the slope of a hill (Figure 6). The excavation of the material was accomplished during four weekends in June, 2012. The crew excavated a minimum of forty (40) centimetres and a maximum of 175 centimetres below datum.
The excavations revealed features comprising circular stone features over a pavement of stones (Figure 7). Within the circular features were clays of different colours (Figure 8), ceramic sherds in various states of firing (Figure 9), and hardened clay material annealed to cinders (Figure 10).

Archaeologists also retrieved lunate-shaped lithic material (Figure 11), adzes of different types (Figures 12 and 13), a lithic denticulate (Figure 14), fire-cracked rocks, ash, charred remains, and other artifacts (Table 2).
The archaeological features at Fagamalo were divided in four square-metre quadrants. In Units 1, 2, 7, and 8, the features comprised an upper level (Phase 1) characterized by large stones covered with grey clay and associated with lithic and ceramic material. These large boulders were purposefully covered with the grey clay because the soil surrounding the large stones comprised silt-sand loam and clays of a variety of colours.

The lower level (Phase 2) comprised a circular stone feature on a platform of flat stones. This platform included ma'ava'i or smoothed stones from ocean or riverine contexts. The ceramic sherds within these structures exhibited different stages of firing. The colours of these pottery materials ranged in colour: bright orange, red, brown, and black (caused by charring).
Archaeologists retrieved ceramic specimens that appear to have been retreated or burnt during re-firing processes perhaps to mend apertures in ceramic vessels.

In addition, charred material was present in and around the archaeological features and artifacts at Fagamalo. Two samples, 15172 and 15173, were sent to the radiometric facilities at the University of Georgia and exhibited dates of 2400±25 BP and 2240±25 BP, respectively. The excavation at Fagamalo represented the second discovery of Polynesian Plainware ceramics in western Tutuila.

<table>
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<tr>
<td>Adze Preforms</td>
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<tr>
<td>Adze Fragments</td>
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<tr>
<td>Complete Adzes</td>
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<td>Ash Rocks</td>
<td>308</td>
</tr>
<tr>
<td>Lithic Scrapers</td>
<td>3</td>
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</table>

Table 2: Artifacts Retrieved from the Fagamalo Site.

We suggest the Fagamalo represents a multi-purpose utilitarian site. Twenty-one metres west of the excavated area, archaeologists identified three grinding stones near a small stream. In addition, we believe the materials at the excavation site at Fagamalo suggest a ceramic manufacturing locale, either a kiln, part of a kiln, or another area involved with pottery making. The archaeological materials at Fagamalo included clays of different colours, ceramic sherds in various states of firing, hardened clay material annealed to cinders, fire-cracked rocks, ash, and
charred remains. Moreover, the features at Fagamalo: circular stone features surmounted on pavements of stones were small, not exceeding 1.5 metres in length, and did not resemble the larger circular or semi-circular structures of a Polynesian habitation or *fale* (Figure 7).

Also, the lithics at Fagamalo were unique: adzes with angled edges and a denticulate perhaps used to shape and incise ceramic vessels (Figures 13 & 14). Other artifacts had an unknown function including boulders covered with grey clay and lunette-shaped lithic fragments. For the latter, Lorena Sciusco, of the National University of Samoa, suggested these lunette-shaped lithic materials were possibly employed to prop up the ceramic vessels during the firing process—allowing heat to circulate over the entirety of the ceramic vessel. Lastly, the ceramic sherds exhibited different stages of firing. Some fragments were totally charred, which might associate with the re-firing or retreating process to mend cracks in ceramic vessels. Other fragments were partially fired, with layers of clay flaking off sherds at the touch. The suggestion that the Fagamalo site represents pottery manufacturing is tentatively made. The features and material culture at Fagamalo does not detract from our hypothesis and yet we have no archaeological analogues in Polynesian prehistory for comparison.

**Leone**

The objectives of the archaeological excavation at Leone were two-fold. First, the salvage excavation was conducted to accommodate American Samoa legislation regarding the protection of cultural property. Second, archaeologists conducted mitigation at this locale to follow Section 106 requirements of the NHPA because Federal aid was used to partially fund the road revetment project.

This Leone site was located between a modern road, a shoreline heavily affected by tidal activity, and planned road-revetment construction. During the initial survey, an array of surficial artifacts appeared from a narrow colluvial channel running through the site: retouched debitage, scrapers, adze preforms, and a single Polynesian Plainware sherd.

The first archaeological work performed in Leone was carried out at Tataga-Matau, a prehistoric adze quarry in the hills overlooking Leone on tribal land (Leach & Witter n.d.; 1987;
The late archaeologist David Kennedy conducted a survey in 2010 for the road revetment project but did not identify the prehistoric site in this report. In 2011, David Addison and an archaeology crew surveyed an area around a bridge, south of the prehistoric site in this report. Here, his archaeology crew discovered the concrete foundations of a historic property. The final report for the Leone site will be submitted to the ASHPO in several months (Klenck & Suafo’a-Taua’i 2014).

In May, 2012, Joel Klenck identified the prehistoric artifacts from the colluvial depression during an inspection of the road revetment project area near the shoreline. The area was cordoned off and archaeologists from ASHPO, ASPA, and local volunteers excavated the site during August, 2012. Also, the midden layer of the site was visible from a profile caused by the tidal activity. Nine one-metre square units were excavated to a depth of 183 centimetres below datum revealing a pavement-like surface consisting of coral, basalt, and other flat stones (Figure 15).

![Figure 15: Archaeological assemblage at Leone, Tutuila Island, American Samoa.](image)

The archaeological remains on and in the midden layer comprised two non-rim sherds of Polynesian Plainware pottery (Figure 16) and mostly basaltic lithic debitage and tools (Figure 17).
Also, found in the midden layer were adze preforms, broken adzes, a scraper, charred organic remains, and other artifacts (Table 3). The Leone site remains undated: A single charred sample indicated contamination from modern carbon.

<table>
<thead>
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<th>Artifact Type</th>
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<td>Ceramic Non-Rim Sherds</td>
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</tr>
<tr>
<td>Retouched / Total Basaltic Flakes</td>
<td>58 / 412</td>
</tr>
<tr>
<td>Adze Preforms</td>
<td>11</td>
</tr>
<tr>
<td>Broken Adzes</td>
<td>10</td>
</tr>
<tr>
<td>Basalt Blades</td>
<td>2</td>
</tr>
<tr>
<td>Basalt Scrapers</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 3: Artifacts Retrieved from the Leone Site.

The circular shape of the floor stones, adze preforms, adzes, and other lithic tools and debitage on (an in) the midden floor is typical of prehistoric *fale* at other locales in Polynesia. A *fale* is usually a domestic dwelling but may serve as a place for the temporary housing of visitors from other tribes and occasionally a site for inter-tribal meetings and ceremonies. Also, the local inhabitants at Leone expressed the excavated area was the site of an ancient *fale*. This factor inspired villagers to volunteer for the Leone excavation.
Discussion

Although temper and clay analysis has not been performed on the ceramic sherds in this report, other studies in Tonga and Samoa indicate “Lapita and ‘Lapitoid’ (Polynesian Plainware) were “manufactured near their collecting sites using locally available temper sands” (Dickinson et al. 1996:87). In Western Samoa, Lapita sherds from Mulifanua on Upolu evidence local temper sands from Upolu (Petchey 1995). With the exception of several petrographically exotic tempers such as temper from New Caledonia in a ceramic fragment from Vanuatu, the academic consensus is that most pottery was manufactured at nearby locales (Dickinson 1971). Conversely, adzes were routinely transported throughout Polynesia over considerable distances (McAlister et al. 2013:259).

The three sites in this report contain two types of Polynesian Plainware. First, thin, fine-tempered wares comprise several sherds at Fagamalo and a single fragment at Leone. The second and most dominant type of Plainware at Maloata, Fagamalo, and Leone, is a thick, coarse-tempered ware. These two ceramic types are also present at other sites in American Samoa including the To’aga site on Ofu Island and Vainu’u on Tutuila (Kirch et al. 1990:7; Eckert & Welch 2013:15). Questions remain; however, as to the composition and material assemblage of Polynesian kilns. To date, we found no articles that note the discovery or potential discovery of kilns from Polynesian prehistory.

As Maloata and Leone are near shorelines and sea levels continue to rise, this study indicates the importance of conducting historic preservation efforts in coastal areas to ensure prehistoric and historic sites are surveyed and excavated before heightened tidal activity and beach erosion.

Also, the discovery of three ceramic assemblages in western Tutuila, in a twelve month period, evidences the importance of Federal, territorial, and locale historic preservation statutes. The
archaeological assemblages at Maloata, Fagamalo, and Leone are now available because statutes were in place to ensure archaeologists searched for and retrieved cultural assemblages prior to modern construction efforts.

The discoveries in this report create new questions: sources of clay and temper materials, cultural position and gender of the manufacturers of ceramic vessels, vessel functions, reasons behind the halt of pottery manufacturing in Samoa around 1700 cal BP, and the relationship between early Lapita ceramics and later Polynesian Plainware. Further, we do not have definitive knowledge of the composition, architecture, or artifactual assemblages pertaining to prehistoric Polynesian kilns.

The discovery of Polynesian Plainware in diverse geographical locales, on the coast or further inland, with different site types, a habitation and multi-purpose utilitarian site, indicates the distribution of ceramics throughout Tutuila Island was more expansive than previously published. Further, these diverse locales might support the notion that ceramic manufacturing in Tutuila was a more ordinary undertaking as opposed to a specialization directed by a tribal authority.

Finally, the carbon dates from the charred samples at Fagamalo do not conflict with the consensus view that ceramic materials appeared on Tutuila by 2700 cal BP and declined (or halted) around 1700 cal BP.
Acknowledgements

We extend our appreciation to Director David Herdrich of the American Samoa Historic Preservation Office; Professor Lorena Sciusco of the National University of Samoa; Professor David Addison of the Samoan Studies Institute; Professor Jeffrey Clark of North Dakota State University; and the executives and managers of the American Samoa Power Authority, especially Mr. Utu Abe Malae, Mr. Joachim Fong, and Mr. Fa‘i Mareko. Lastly, we thank the volunteers that participated in the excavations, particularly the helpful, numerous, and enthusiastic volunteers from Leone.

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