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Archaeological Investigations at the Pulemelei Mound, Savai'i, Samoa

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**BACKGROUND**

Archaeological investigations began in Samoa in 1957 when Jack Golon excavated some settlements and mounds on 'Upolu (Green and Davidson 1969:3). In the 1960s, Roger Green initiated an archaeological investigation program on Western Samoa (Green and Davidson 1969, 1974, Green 2002:125-152). These projects were followed by a research program inaugurated by Jesse D. Jennings (and others) from 1974 to 1977 (Jennings et al. 1976, Jennings and Holmer 1980, Jennings et al. 1982).

The islands of the Samoan group (Figure 1) were formed by volcanic activity and are essentially mountains and ridges of erupted rock sitting on the Pacific Plate. Eruptions have been ongoing and the south and north coast of Savai'i are now covered by lava, which probably destroyed or made many archaeological sites inaccessible. The rapid rate of island subsidence calculated by Dickinson and Green (1998) at 1.4 mm/year suggests that the oldest sites in Samoa might well be 4 m below their original position relative to sea level.

In recent years most of the archaeological activities have concentrated on American Samoa (Hunt and Kirch 1988, Kirch and Hunt 1993, Clark and Herdrich 1993, Clark and Michlovic 1996, Clark et al. 1997, Ayres et al. 2001, Suafo'a 2001, Taomia 2001). Previous and current research on Fiji-Tonga-American Samoa has broadened the knowledge of the prehistory of the central Pacific but Savai'i, as it was 20 years ago, is very much an archaeological “no man’s land” (see a recent summery on Samoan archaeology by Green 2002:125-152.).

**EXCAVATIONS AT PULEMELEI MOUND**

The aim of renewed work at Pulemelei in 2002 was to improve the archaeological understanding of prehistoric development on Savai'i by investigating the origins and development of monumental architecture. The Pulemelei mound and surrounding structures appear not to have been recorded in traditional history, but archaeological investigations of mounds on 'Upolu and American Samoa suggest construction and use of mounds during the period AD 1000 to AD 1600 (Jennings and Holmer 1980:5-10, Kirch 2000:219-229). Very little is known of the temporal context and function of field monuments (Herdrich 1991:381-434), and investigations should provide new knowledge about these important archaeological sites and the development of complex societies in central Pacific.
The archaeological investigation at Pulemelei mound on the Letolo plantation on Savai‘i (Figures 2 and 3) is a collaborative project between the landowners of the Nelson Plantation Inc, the Kon-Tiki Museum, Oslo, Norway (Drs. Martinsson-Wallin and Wallin), the Australian National University, Canberra, Australia (Dr. Clark), and The National University of Samoa (Dr. Asofou So'o). Work at Pulemelei took place between the 13th September and 11th October 2002. Archaeologists in the field were Drs. Wallin and Clark plus twenty men from the nearby Vailoa village who were employed as field assistants, aided by the foreman of the Letolo plantation, Mr. Aiolupo. The purpose of the preliminary work was to expose the mound so that a new map could be made in order to assess the degree of structural degeneration in the 37 years since it was last mapped, and to allow detailed description of the mound. Test excavations were planned to obtain samples for radiocarbon dating and to examine the construction sequence.

After the mound was cleared it was measured and found to have base dimensions of ca 65 m x 60 m with a maximum height above the ground surface of about 12 m on the south edge and 7 m along the north edge (Figure 4). It was constructed with a base platform and three platforms on top of each other. The base platform of volcanic stones was about 0.6 m high and it appears to be built on vertically placed foundation stones with earth fill behind the foundation stones. On top of the foundation stones was a base platform made of volcanic stone around 2 to 3 m high (the height varies on the south and north edge) with vertical or slightly sloping sidewalls. On top on this was a platform made of volcanic stone around 3 to 6 m high (the height varies on the south and north edge) with sloping sidewalls. The top platform was 1.1 m high and had vertical sides and was also made from volcanic stones with maximum dimensions of 44 m by 34 m. The top platform surface was level and paved with rounded stream stones about 5 to 15 cm in greatest length. More than 40 stone cairns were found distributed on the top platform. These cairns may be of a very recent origin since there are only 10 recorded in Scott’s 1965 map (1969:80) and local informants reported that stone piles were built when the mound was cleared of vegetation.

**TEST EXCAVATION AND RESULTS**

Nine test-pits (TP 1-9, 1 m x 1m) were placed on the ground around the sides of the structure with a larger test trench (Trench 1, 2 m x 4 m) on the south edge. The test trench was placed where an intact part of the base platform had survived collapse because it was protected by a stone ramp, which in turn buttressed the base platform on either side of the ramp. A preliminary investigation of the structure of the top platform was made when the removal of roots from a large tree exposed the sub-face material to a depth of 80 cm.

The excavations recovered charcoal from all pits and the trench. Fragments and dispersed charcoal were frequently found at of about 20 cm to 40 cm below the ground surface (Figure 5b). It is possible that the charcoal represents initial clearing and burning during the building phase or postconstruction vegetation clearance. In one of the test pits (TP 1) as well as in the larger trench (Trench 1), we found prehistoric earth ovens (umu) at the same depth as the scattered charcoal and Test Pit 3 also contained a charcoal concentration (Figure 5a). The ovens contained charcoal and fire-cracked volcanic stones, but no other faunal nor artifactual finds were observed. The ovens are clearly the result of activity carried out in close proximity to the structure, perhaps during the initial construction phase, but the origin of the scattered charcoal is less certain. In addition a charcoal concentration from the hole excavated to remove tree roots on the top platform allowed us to date use of the top platform and to compare the result with dates for oven use and other charcoal producing events near the base of the Pulemelei mound.

Another important find was two ceramic sherds from TP 3 and TP 5, both on the west side of the structure. These are the first ceramic sherds found on Savai‘i apart from recent discovery of pottery at Siutu village by Japanese archaeologists (Ishimura personal communication) The sherd from TP 3 was
found at ca 40 cm depth in a yellow-brown fine silty-clay beside a small charcoal concentration. The other sherd was found on the top of the TP 5 spoil heap. Since it was found on the top of the pile, it probably came from the bottom of the excavation (ca 50-60 cm depth).

The *umu* charcoal in TP 1 has a conventional radiocarbon age of 780 ± 120 BP (ANU-11891) and a calibrated 2 sigma range of AD 1020 to AD 1400. A sample from the charcoal concentration in TP 3 has an age of 850 ± 50 BP (Beta-172927) and has a calibrated range of AD 1040 to AD 1270. These determinations may provide an age for the initial construction phase of Pulemelei. Scattered charcoal from a depth of 10 cm to 20 cm in TP 6 has an age of 680 ± 80 BP (Beta-177607) and has a calibrated range of AD 1230 to AD 1420. This might indicate activities tied to the use of the site and possible later clearing and building activities. The charcoal sample from the tree root excavation on the top platform has a conventional radiocarbon age to about 11 m to 12 m. The radiocarbon dates are the first for Savai'i and suggest that activities in the vicinity of the mound span AD 620 to AD 1690 (Figure 6), although the presence of a few ceramic sherds might indicate human use before AD 600. The dates on the two *umu* are different and do not overlap each other but follow in sequence suggesting ongoing use of the area. The oven closest to the mound in Trench 1 has an earlier age (AD 620 to AD 1000) than the sample from the *umu* in TP 1 (AD 1020 to AD 1400). The date of the charcoal concentration in TP 3 (AD 1040 to AD 1270) is similar to the TP 1 oven. The date of the scattered charcoal found at 10-20 cm in TP 6 (AD 1230 to AD 1420) indicates the ongoing use of the site.

<table>
<thead>
<tr>
<th>Lab no</th>
<th>Location</th>
<th>Depth, provenance</th>
<th>Material</th>
<th>13C/12C Ratio</th>
<th>Conventional Radiocarbon age BP</th>
<th>Calibrated AD 2 sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-172927</td>
<td>Test pit 3</td>
<td>40 cm, charcoal concentration</td>
<td>Charcoal</td>
<td>-27.5 o/oo</td>
<td>850±50</td>
<td>1040-1270</td>
</tr>
<tr>
<td>Beta-172928</td>
<td>Trench 1</td>
<td>40 cm, from earth oven</td>
<td>Charcoal</td>
<td>-26.1 o/oo</td>
<td>1250±100</td>
<td>620-1000</td>
</tr>
<tr>
<td>Beta-177607</td>
<td>Test pit 6</td>
<td>10-20 cm, scattered charcoal</td>
<td>Charcoal</td>
<td>-26.6 o/oo</td>
<td>660±80</td>
<td>1230-1420</td>
</tr>
<tr>
<td>ANU-11890</td>
<td>Top platform</td>
<td>60 cm, under flat stone below tree root</td>
<td>Charcoal</td>
<td>-24.0±-2.0</td>
<td>310±90</td>
<td>1420-1690</td>
</tr>
<tr>
<td>ANU-11891</td>
<td>Test pit 1</td>
<td>40 cm, from earth oven</td>
<td>Charcoal</td>
<td>-24.0±-2.0</td>
<td>780±120</td>
<td>1020-1400</td>
</tr>
</tbody>
</table>
The late age for the single sample we have from the top platform suggests it might be a later addition to the mound. The evidence from the dated samples and the finds of ceramics suggest that this area has been utilized by Samoans for at least the last 1500 years.

Further investigation and dating needs to be conducted before more secure conclusions can be reached. The preliminary work shows that large structures like Pulemelei are complex constructions that may have been built over quite long intervals and as a result they are likely to have had multiple functions. In 2003 we will be returning to Pulemelei to carry out more extensive investigations of the main mound and also of surrounding structures to examine questions of chronology and function raised by our initial research.

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REFERENCES


