

The Pulemelei complex: mounds, house platform and *umu* *tī*

Taken together the mapping and excavation work provided new information about the age and construction of the Pulemelei mound. The base platform was outlined with vertical stone slabs and then built up by stacking stone slabs horizontally. The vertical foundation slabs in several of the excavation trenches had tilted outward from the weight of the structure, which suggests that the construction technique was unsuited for large structures (Figure 5). If additional platforms were added to the base platform, as seems likely, then the extra weight would have increased the pressure on the vertical foundation stones. Tilting of some vertical foundation stones caused wall collapse higher up the mound, and earthquakes, which are frequent in Samoa, tree growth, and human activity, have all contributed to structure deterioration.

The west entranceway (and probably the east entranceway) appears to have been late modifications to the Pulemelei mound. Excavation of the rubble edge along the base platform on the west side of the mound found water-smoothed pebbles (*'ili'ili*), similar to those used to pave the top platform. We estimate that the pebble surface was roughly level with the top of the base platform. In addition to results from the excavation, ground penetrating radar results (see Clark and de Biran this publication) also suggested the presence of a distinct layer below the top platform, and it is likely that the Pulemelei mound was constructed in several distinct episodes. The first was the building of a large level platform 3-4 m high on the south side that was paved on top with water-rounded pebbles. The presence of silty-clay with the pebbles probably reflects the inadvertent introduction of sediment from human activity. If so, then there is likely to have been a reasonable hiatus between the construction of the base platform and the addition of the smaller overlying platforms. The base platform was higher on the south side and was almost level with the ground on the north side, a platform style similar to that of the North mound (Figure 4).

The excavation and radiocarbon result from the top platform suggests it was a subsequent addition to the mound. The squared shape may indicate a ceremonial function (see Clark and Martinsson-Wallin, this publication), but there was no evidence for postholes that might indicate a temple or god house. However, we acknowledge that given the amount of disturbance evidence of postholes may no longer be identifiable.

Early settlement

Evidence for settlement predating mound building was found to the south and west of the Pulemelei mound, as well as underneath it. The latter two areas were close to each other and they also had similar radiocarbon ages.

On the south side of the mound is a natural terrace with low house platform (see description above) (Figure 12). Beneath this platform the oldest settlement deposit was found, and it was investigated with several trenches (Trench

7, 7b, 10, 12, 14). Under the stone pavement there were at least one occupation layer, and possibly two. The dark charcoal-stained soil in Trench 7 suggested a pit or earth oven. Ceramic sherds as well as a stone cylindrical lug/foot/handle and two grinding stones were found at 30-55 cm depth. Scattered charcoal was present in the trench down to a depth to about 50-60 cm. Below ~ca. 60 cm depth it was evident that the dark soil in the northwest part of the trench originated from a deeper earth oven, which had been disturbed at the top. Large pieces of charcoal were collected from the oven and a polished basalt chisel was also recovered. At a depth of 83 cm a piece of pottery was found inside the earth oven. At the base of the earth oven at 97-102 cm depth there were fire-cracked rocks (10-20 cm in diameter) and abundant charcoal.

Two charcoal samples associated with the earth oven, one from Trench 7 and one from Trench 9 (Wk-13868) and (Wk-15501) respectively has indicated a usage of this area going back at least 2000 years (Table 1, Figure 13). Only a small part of the earth oven was present in Trench 7, and it extended into Trench 9 and Trench 12, where there was also charcoal, fire-cracked stones and a few ceramic sherds. Since probably the major part of oven is to be found outside the excavated areas the true diameter of the oven could not be estimated but it seemed to be larger than 2 metres in diameter.

In Trench 14 the cultural layer below the pavement was thinner (ca. 20 cm) than that found in Trench 7, 9 and 12, and only a few ceramic sherds and basalt flakes were recovered. Trench 10 and Trench 11 (Figure 3 a) were excavated to understand the connection, if any, between the evidence for prehistoric activity near the south wall of the Pulemelei mound and that under the south pavement below the house foundation. A posthole and an earth oven were found in Trench 10; a charcoal sample from the oven has been dated (Wk-16642) (Table 1). In Trench 11 there was an abundance of scattered charcoal, but no identifiable features.

The excavations on the south side of the mound revealed human activity prior to the construction of the pavement and house foundation. The dates on the earth oven in Trench 7, 9 and 12, and presence of ceramic sherds point to the area being utilised for settlement 2000 years ago,

On the west side of the mound and under it there were prehistoric remains in Trench 3 and Trench 13 that predate construction of the base platform. Trench 13 revealed vertical foundation stones and under the base platform there were several ceramic sherds, and an earth oven or hearth was dated by sample (Wk-16640) (Table 1) (Figure 8 a, b). The remains all necessarily predate mound building, but probably date from different time periods. Vertical stones, possibly a destroyed house foundation, an earth oven dated by sample (Wk-13869) (Table 1), and a few sherds were found in Trench 3 outside the mound perimeters but below foundation level.

Some leveling of the ground surface below the base platform appears to have mixed remains from earlier activity, and most of the ceramic sherds, for instance, are interpreted as being in secondary deposition. For example,

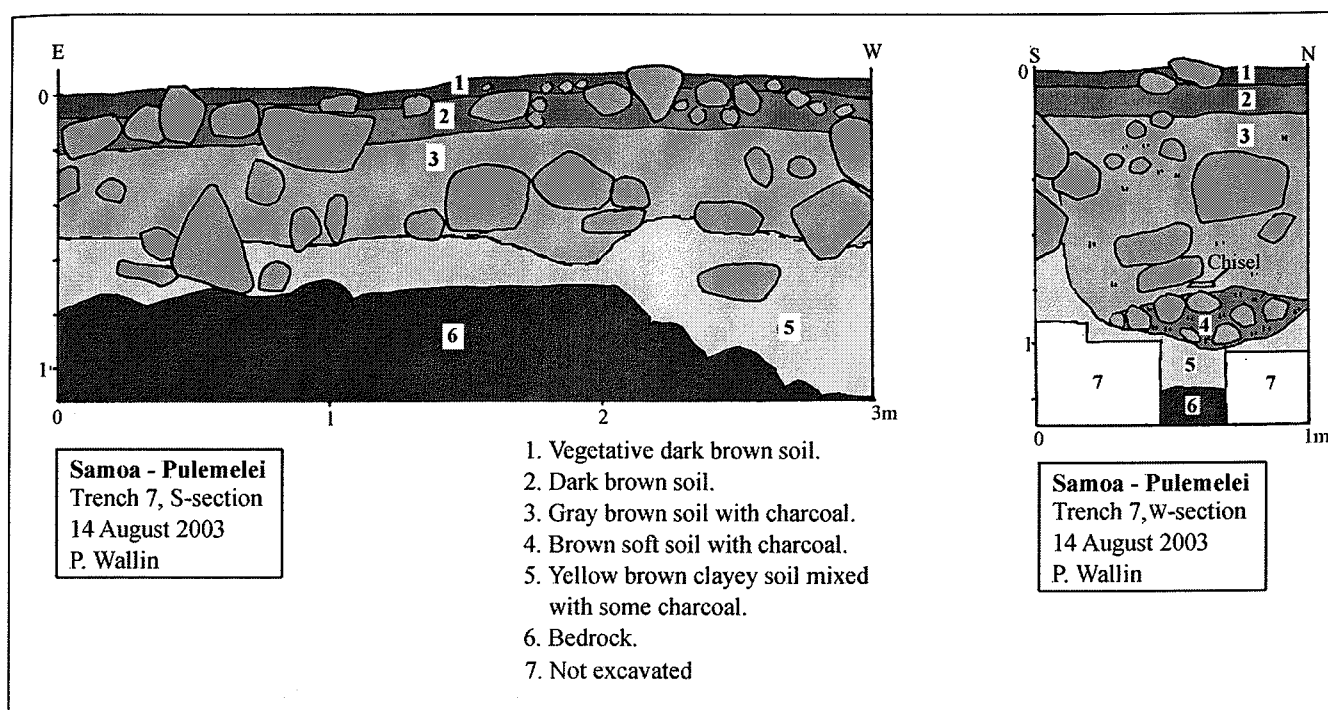


Figure 13. Left: South section, trench 7, showing the house platform in the upper 20 cm; right: earth oven from early settlement activities in West section.

there were only a few small sherds found in several earth ovens, dating to ca. 1000 BP. The radiocarbon dates from Trench 7 and Trench 9 indicate human activity at ca. 2000 BP. Ceramics, the basalt chisel, small grinding stone and part of a stone tool/handle are clearly associated with the early occupation.

Three earth ovens found between the south pavement and Pulemelei mound, and close to the west entrance, as well as from under the mound indicate a second phase of activity prior to mound building at ca. 1200-1000 BP. In most of the trenches there was a layer of scattered charcoal at about 40 cm depth, which may derive from clearing the ground of vegetation before construction of the base platform. We suggest that the initial construction of the base platform of Pulemelei dates to ca. 900-800 BP. A detailed discussion concerning the dating of the mound and its adjacent remains in relation to the chronology of Samoa prehistory is found in another article in this publication (see page 71).

Artefactual remains

The artefacts from the excavations at Pulemelei are sparse and consist primarily of stone tools and ceramic sherds, but nonetheless the assemblage represents the remains of Samoan material culture from some 2000 years of human occupation. The distribution of artefacts is shown in Table 2. The lithics have not been subjected to detailed petrological or chemical analysis, although a larger study including Samoan lithics from excavation and museum collections is planned in the future.

Artefacts	Number
Ceramics	137
Adzes	5
Chisel	1
Grinding Stones	4
Hammer stone	1
Cylindric tool/handle	2
Stone tools/scrapers	4
Worked stones	3
Cores	2
Adze flakes	13
Flakes	47

Table 2. Artefacts found in the excavation.

Lithics

Two adzes (Figures 14 a, c), one adze perform (Figure 14 b), and a part of an adze (Figure 18 a), and two hammer stones (Figures 17 a, c) as well a few polished (Figure 18 f, i, g, k, e) and unpolished flakes are temporally associated with mound construction and use. The stone material is a dense fine-grained volcanic stone that has a light grey-green color. According to Leach and Green (1989: 323) most Samoan adzes were made in olivine basalt. The adzes and the preform found in excavations are probably contemporary with use of the Pulemelei mound. In typology the adzes are similar to Types VIII, IX and X (following the typology by Green and Davidson 1969b). The chronology of Samoan adze types is not entirely clear, but the most common is

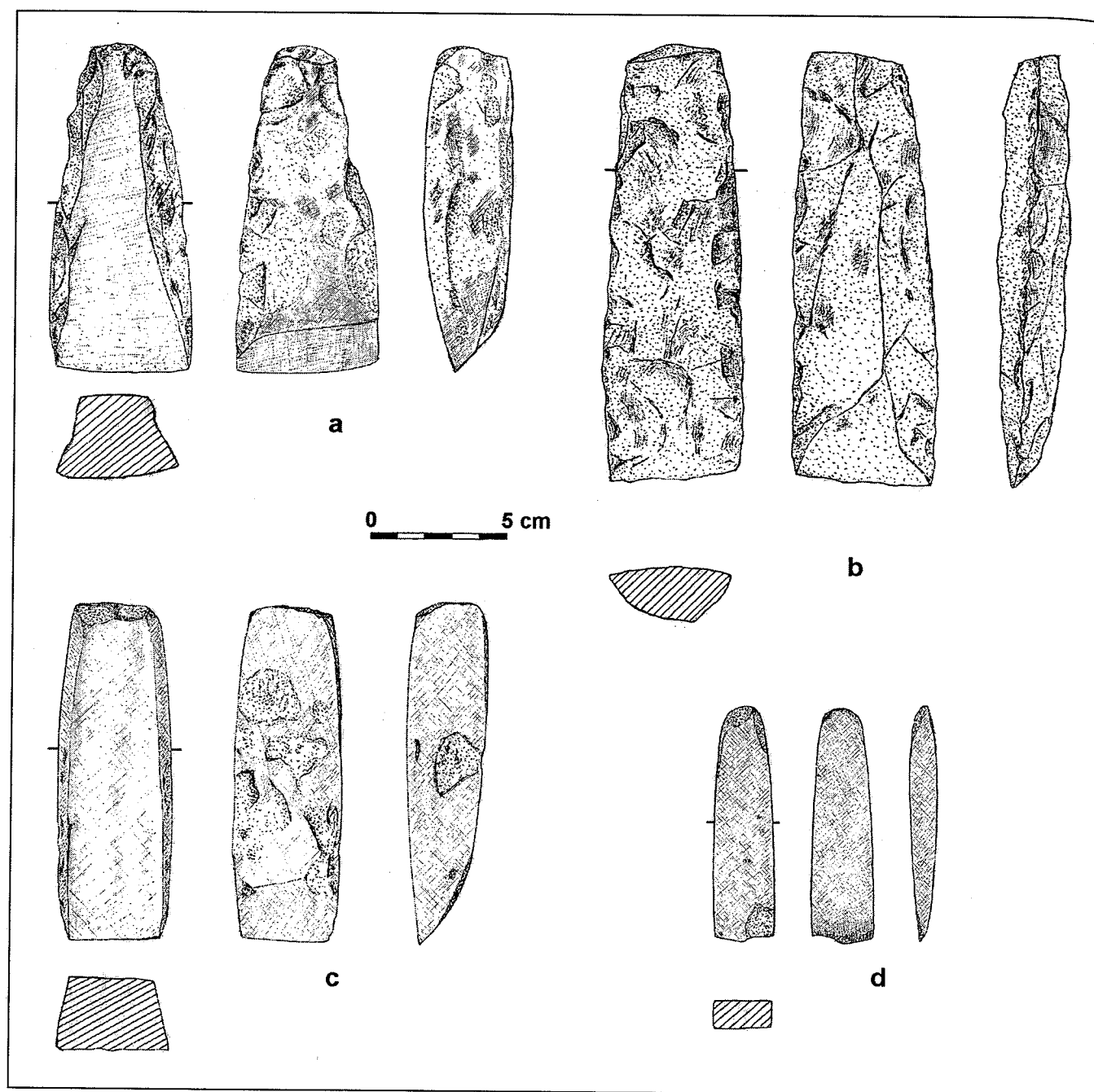


Figure 14. Adzes found in the excavations: a. Type IX, b. Type VIII, c. Type X, d. Chisel.

Type I, which occurs through the entire prehistoric sequence (Hewitt 1980b: 136-7). However, Green (1974a: 253-67) suggests that adze Types II, IX/X and VI are late prehistoric forms. Type V is an early adze type associated with the Lapita settlement complex (Leach and Green 1989:326).

The lithics associated with the oldest settlement under the south pavement were in the vicinity of an earth oven dated to ca. 2000 BP (Figure 13 layer 3). They comprised a chisel (Figure 14 d), the end of a tool/handle (Figure 15 a), a small grinding stone (Figure 16 b). In the upper level of layer 3 were an elongated abrader (Figure 15 b), another part of a separate abrader (Figure 16 c), two basalt cores (Figures 18

l-m), a polished flake (Figure 18 c) and worked stones (Figures 16 a and 17 b,d,e). These might also belong to the earliest cultural deposit. Adze flakes found in association with trench 4 (Figure 18 b), trench 10 (Figure 18 h) and trench 13 (Figure 18 j) probably belong to the phase of site use dated to ca. 1150 BP that just preceded the construction of the base platform of Pulemelei.

Both the chisel and the flakes appear to have been made from the same type of fine-grained basalt as the adzes. The tool/handle with a round cross-section might be an abrader, or handle of a chisel or pestle. It is made of a dense fine-grained stone, light brown in colour, which is similar to the

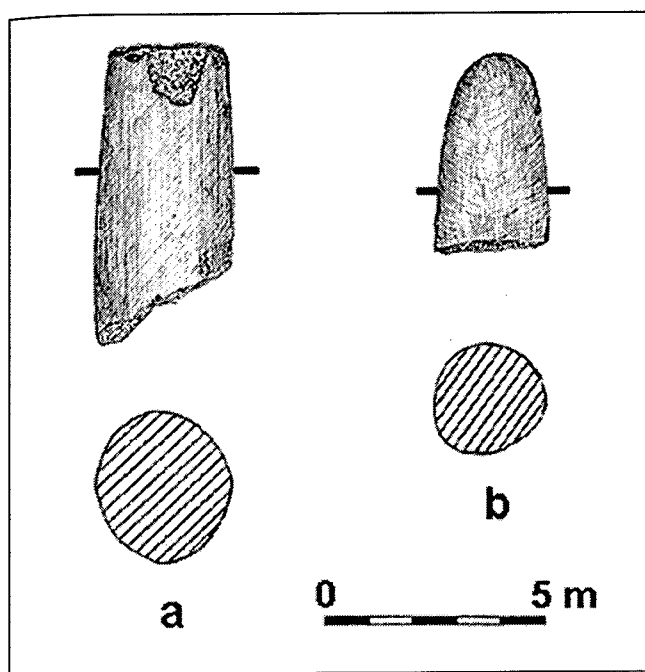


Figure 15. Lithic tools found in the excavations: a. Handle/Abrader, b. File/Abrader.

material used to make the small grinding stone. The tool/handle material also resembles that used to make an abraded which was excavated at Mouth Olo (artefact SU/A 17/111 in Auckland Museum). A scraper tool from Trench 14 is made in a dense fine-grained brown stone, another stone type. The end of a narrow abrading tool made in grey basalt and found in Trench 12, might derive from the same

type of stone as some of the flakes. The type of abrading tool is similar to those from American Samoa (David Addison, pers. comm. 2005).

Ceramics

In the excavation there were two main areas with pot sherds. One was the cultural layer under the house pavement south of the Pulemelei mound (Trenches 6, 7, 7B, 9 and 12), where sherds occurred under the pavement between 20 cm and 1 m depth, close to the bedrock. The other area with pottery (Trenches 3 and 13) was close to the west entrance, and under the base platform. The distribution of the sherds in the two areas and the variation in thickness among the sherds are seen in Figure 19. In both areas it has been difficult to establish the connection between earth ovens, stone features, and the pottery, since sediment seems to have been mixed and moved around.

The sherds are highly fragmented with only a few rims and one base sherd recorded. However, most sherds were relatively thin with a medium-to-fine temper (less than or equal to 1 mm in diameter) (Figure 20). A few sherds may have a reddish-brown slip, and some have been fire damaged. The ceramics from Pulemelei, although highly fragmented, appear similar to plain ceramics from the Manono, and Jane's Camp, sites analysed by Holmer (1980: 104-16) and Smith (1976). The temper content is ca. 20%, and the composition of the temper indicates that it probably is locally made at the Pulemelei site (see below). A multivariate statistical analysis of the Pulemelei sherds compared three variables (Table 3, Figure 21), and the results suggested that thin sherds tend to be more fragmented, and were found deeper in excavations than thick sherds. This fits well with the results of

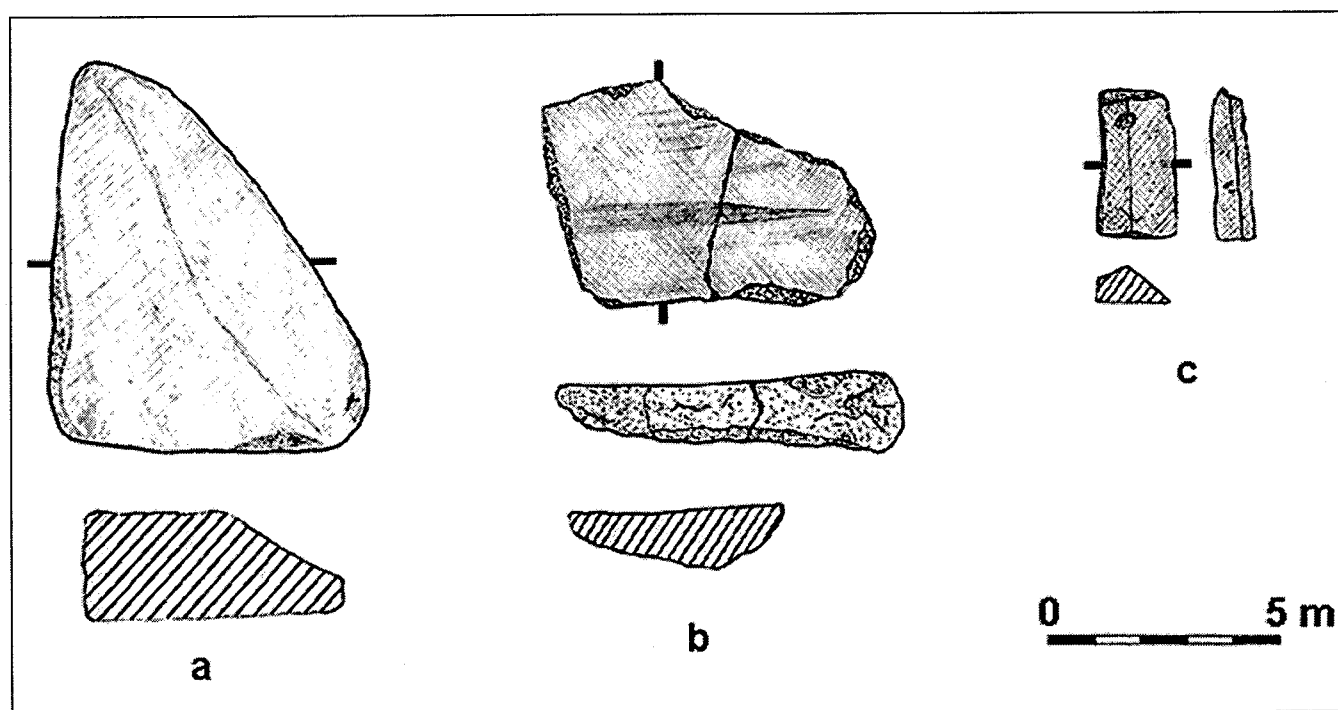


Figure 16. Lithic tools found in the excavations: a. Worked stone, b. Grinding stone, c. Grinding stone (part).

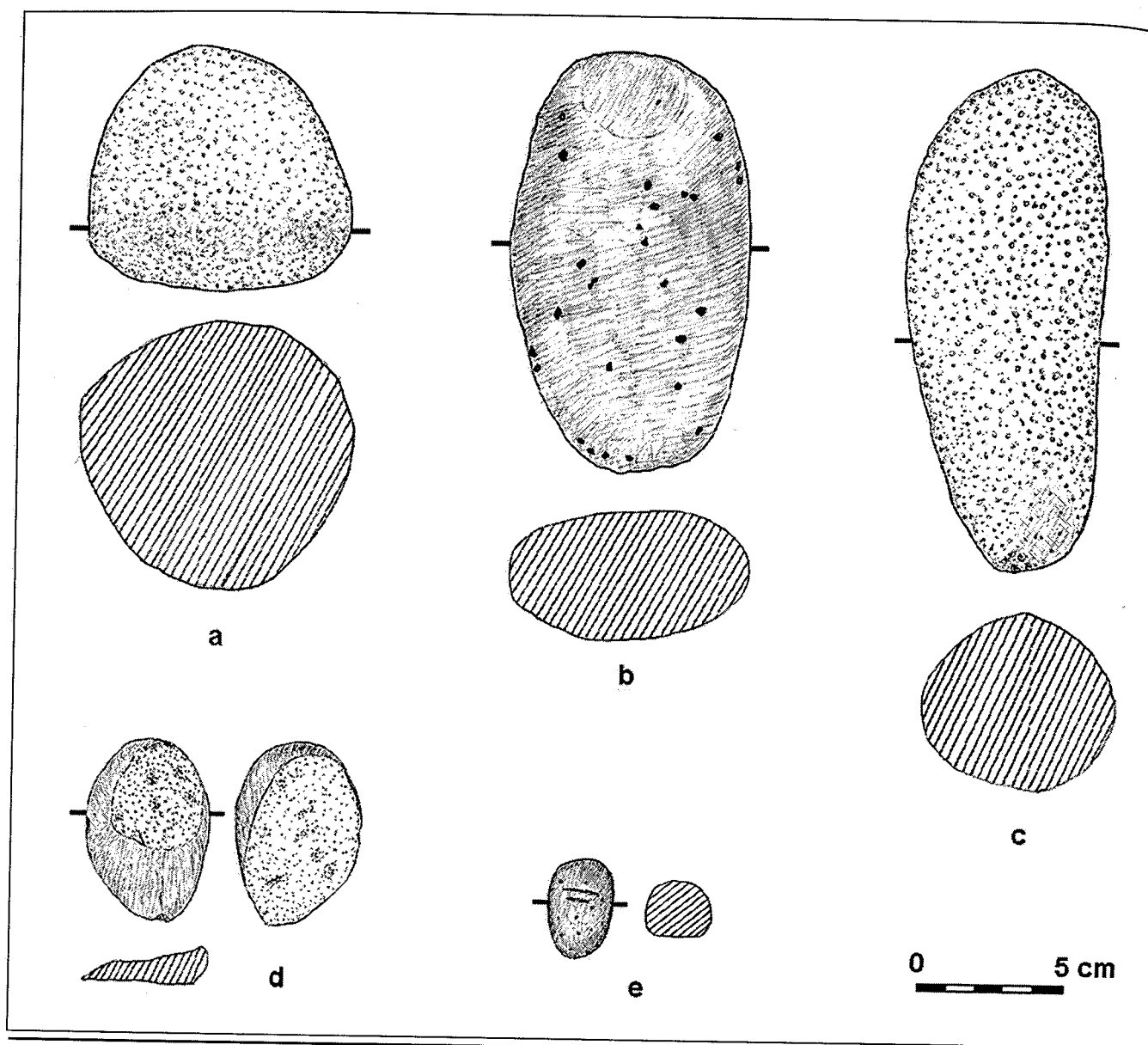


Figure 17. Lithic tools found in the excavation: a, c: hammerstones; b,d: reworked stones.

earlier analyses of Samoan ceramics (Green 1974b: 117-30; Holmer 1980: 104-16; Hunt and Erkelens 1993: 123-56).

Temper analysis

Two ceramic sherds (one from Trench 7b and one from Trench 3) were studied in thin section by William Dickinson (2005). According to his analysis both sherds have tempers of moderately-to-well sorted and sub-rounded to rounded stream sands, composed almost exclusively of basaltic fragments (polycrystalline with dominantly intergranular internal texture typical of olivine basalt). Microphenocrysts in the lithic fragments include olivine and less common clinopyroxene (augite). Rare monocrystalline sand grains of clinopyroxene are also present, as are microlitic lithic fragments (plagioclase microlites set in nearly opaque

tachylitic glass) probably derived from chilled lava surfaces or basaltic tephra. Rounded grains of yellowish-to-reddish and partly altered mafic glass from lava rinds or tephra particles also occur sparingly in one sherd. The consistently large size of temper grains (medium to coarse sand) indicates that temper sands were deliberately added by potters to sand-free clay bodies.

The grain aggregates are consistent with derivation from the alkalic olivine basalts of the Salani Volcanics (late Pleistocene to early Holocene) and Puapua Volcanics (late Holocene) exposed upstream in the hinterland of Pulemelei, with the latter source in the Savai'i uplands probably most likely as judged from petrographic descriptions (R.N. Brothers in Kear and Wood 1959).

The sherds are the first from Savai'i to be examined petrographically, and the tempers are distinct from those in sherds from other Samoan islands (Upolu, Tutuila, Ofu).

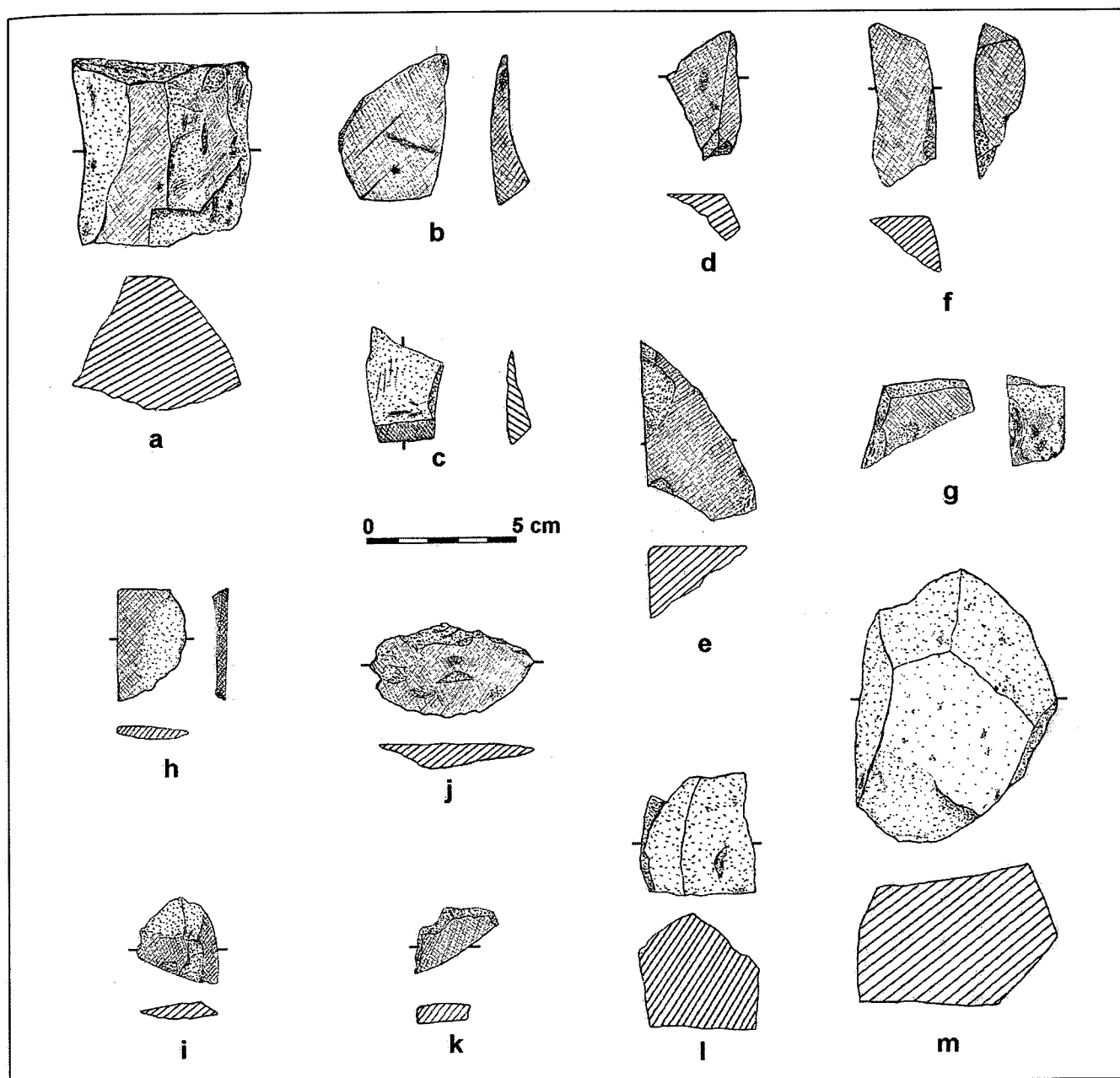


Figure 18. Lithics found in the excavation: a: part of an adze, b-k: flakes from polished adzes (j reused as a scraper), l-m: cores.

All Samoan tempers were derived alike from basaltic or associated trachytic source rocks, but the beach sands, colluvial debris, and crushed rock that served as temper in other Samoan sherd suites are unlike the stream sands used for Pulemelei temper. Natural alluvial temper in selected Ofu (Toaga) sherds (Kirch and Hunt 1993) is both texturally and compositionally distinct from the artificially added alluvial temper sand in Pulemelei sherds. Consequently, the Pulemelei sherd tempers are interpreted as indigenous to Savai'i, and are probably sands collected from channels or banks of one of the nearby stream courses (either Seugagogo Stream or Faleata River), both of which tap Puapua Volcanics in their headwater reaches.

Variable group	Variable
Final Depth	0-20 cm
	21-40 cm
	41-60 cm
	61- cm
Sherd Area	1) 12-176 sq.mm
	2) 177-539 sq.mm
	3) 540-2500 sq.mm
Sherd Thickness	Thin. 4-5 mm
	Medium. 6-7 mm
	Thick. 8-12 mm

Table 3. Variables used in the correspondence analysis of the ceramic sherds.

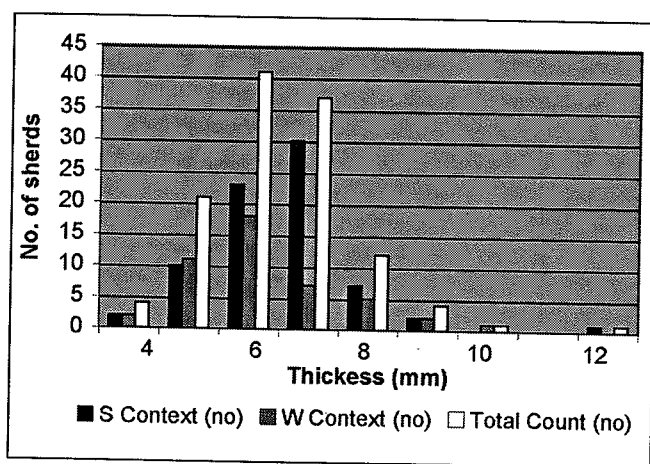


Figure 19. Distribution of ceramic sherds (no.) found in the south and west area and their thickness.

Archaeological assessment of the Pulemelei mound complex

The Pulemelei mound and surrounding prehistoric structures, including the *umu ti* and North mound, have a layout similar, in some respects, to the high-status settlement unit of Tulaga Fale at Mt Olo (Hewitt 1980a: 42-54). Tulaga Fale is a large, low platform (Platform 6) facing a walled walkway, and at the back of the platform there is a raised walkway connecting it to a smaller platform (Platform 7), which in turn is close to a large *umu ti*, called *Ma'a ti*. The large platform at Tulaga Fale is only 90 cm high, although it may have been slightly higher in the past. The Tulaga Fale platform was interpreted as the foundation for a community house (Hewitt 1980a: 50). Platform height is linked to high-status/special function activity, and the

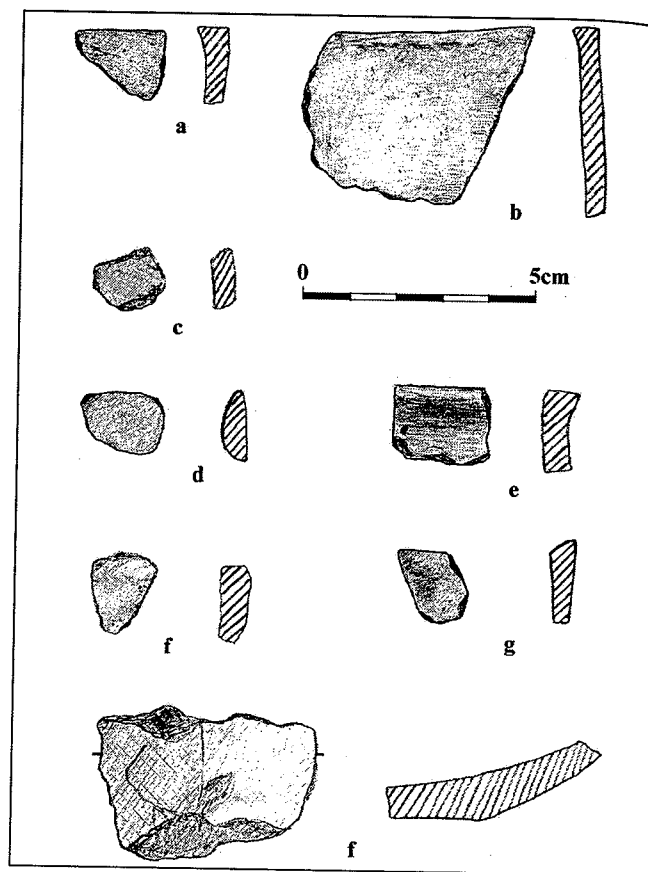


Figure 20. Ceramic sherds: a-g: rims, h: bottom part of vessel.

higher base platform of the Pulemelei mound suggests a different function from that of Tulaga Fale.

In addition to the parallels found between the Pulemelei structures and those of Tulaga Fale, there are also

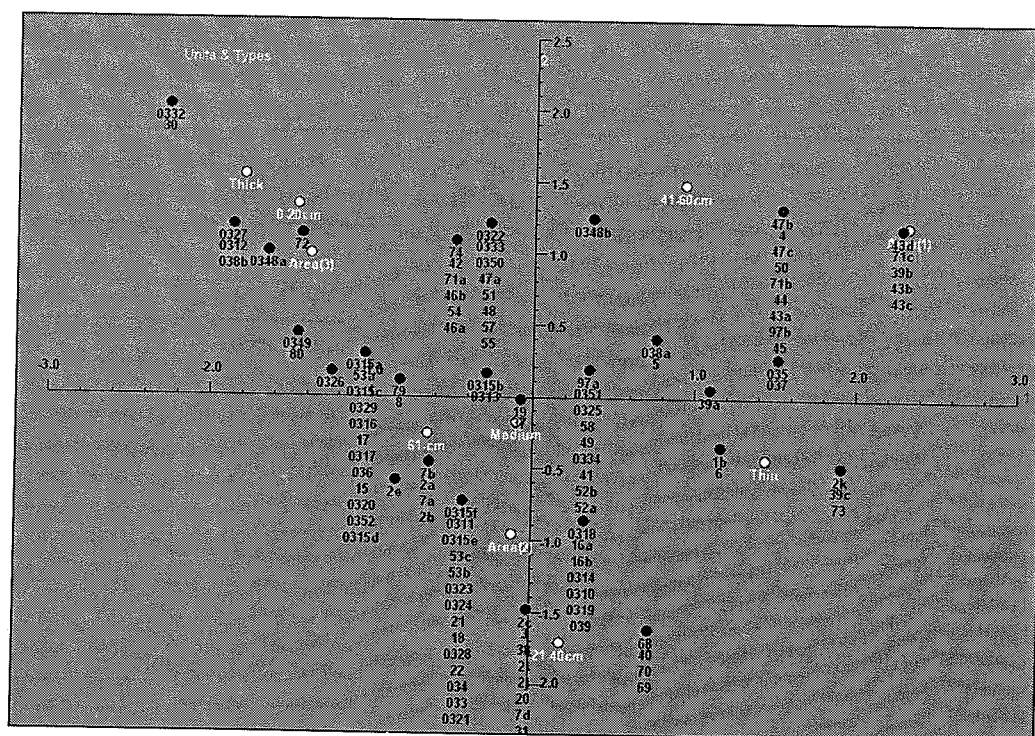


Figure 21. Correspondence analysis based on the variables shown in Table 3.

similarities in some radiocarbon dates. Two dates from the *umu ti* (*Ma'a ti*) at Tulaga Fale had ages of 290 ± 55 BP (UGa 1988) and 440 ± 100 BP (UGa 1987), similar to the determination of 372 ± 43 BP (Wk 13866) on the large *umu ti* beside the North mound at Pulemelei. A charcoal date from a shallow oven/hearth under the Tulaga Fale platform gave a CRA of 1115 ± 75 BP (UGa-1985), almost identical to a dated earth oven found under the Pulemelei mound with a CRA of 1135 ± 34 BP (Wk-16640). However, at Pulemelei there is evidence for a longer history of human occupation, as well as a more complicated sequence of mound construction than was found at Tulaga Fale. Another large structure in the Letolo area subjected to a preliminary investigation was a defensive wall situated between the two river arms ca. 1.5 km upland of Pulemelei mound. The wall is called Pa Tonga and the preliminary investigations indicated an age of ca. 950 BP (Brødholt and Vuijsters 2004) (Figure 22).

The archaeological results suggest at least four distinct phases of human activity at the Pulemelei mound site, which are summarized below.

1. Early settlement phase: 150BC–200AD

The early settlement is to be found on the south side of the Pulemelei mound on a soil-covered natural stone outcrop. Archaeological remains consist of earth ovens, plain pottery and stone tools. The remains are interpreted as likely to indicate a dispersed settlement pattern consisting of scattered households spread through the upper and lower reaches of the Letolo plantation.

2. Pre-mound phase: ca. 200–1000AD

From about 200–700AD there were no dated activities found in the excavations. Towards the second half of the so-called “Dark Age” (see Chapter 5) around ca. 700–1000AD, there was sparse evidence for prehistoric human activity. This consisted of a few basalt flakes and earth ovens on the south and west side of the mound, as well as one earth oven

found under the base platform of Pulemelei. It is unclear if there was a genuine hiatus in settlement from 2000–1200 BP, or, as seems likely, the pattern of mobile, dispersed settlement continued in the area, but not in the locations sampled by our excavations.

3. Mound construction: 1100–1300AD

The first phase of mound construction began outlining the sides of the base platform by digging a shallow trench and positioning vertical slabs of local basalt in the trench. On top of the foundation stones the walls of the platform were built by stacking volcanic slabs on top of one another. Considering the large size of the base platform it was most likely a ceremonial venue, and might have been the foundation for a religious structure house or chiefly meeting place. The top of the base platform was probably paved with water-smoothed pebbles, and the presence of a clay and pebble deposit at a depth estimated to be level with the top of the base platform, indicates a period of mound use prior to additional platform construction.

4. Ceremonial efflorescence: 1400–1600AD

Intensification of ceremonial activity from 1400–1600AD is represented by the construction and use of a large earth oven (*umu ti*) near the North mound and the substantial addition of the top platforms to the base platform. These additions elevated the top of the Pulemelei mound 12 m above ground surface on the south side, rendering social activity on the mound top invisible to people at ground level. The east-west orientation of the two entrance stairways also indicates a ceremonial function, as do several other structures such as the ramp-like features on the south and north sides of the Pulemelei mound, surrounding stone pavements (east, south and west sides), and stone walls/walkways, one of which directly connects the North mound with Pulemelei. The top of the North mound is approximately level with the top of the Pulemelei mound, and unlike other areas, has a direct view of the top platform of Pulemelei from the North



Figure 22. Part of the cleared Pa Tonga wall. (Photo Helene Martinsson-Wallin)

mound. Radiocarbon dates suggest that the top platform may have been built 100-200 years after the North mound (see Wallin, Martinsson-Wallin and Clark this publication).

The presence of several pavement zones at the base of the Pulemelei mound and distinct entrance points to the top platform all suggest that between 1400AD and 1600AD social space around the mound was segregated, and that an important function of the Pulemelei mound was to symbolically diminish these differences through the creation of a shared high-status space on the top platform. If so, the ceremonial activity at the Pulemelei mound during this phase might represent an attempt to forge new socio-political configurations. The pavements and structures around the mound perimeter could have been used to acknowledge and separate different groups, while activities carried out on the top platform would have emphasized collective behaviour and group integration. The coming together of the four *Pule* titles on Savai'i, mentioned in traditional history, might represent an event requiring the construction of a structured venue, like the Pulemelei complex, for high-status ceremonial-political action.

5. Complex abandonment: 1700–1800AD

The Pulemelei mound and associated structures, like those in other parts of Samoa, were abandoned in the late prehistoric/proto-historic period, marking a major shift in the settlement pattern (Green 2002). The shift is attributed to the effects of European contact that in tandem with indigenous cultural trajectories, we believe, caused significant change to the Samoan political system.

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