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Archaeological Studies of the Middle and Late Holocene, Papua New Guinea Part IV

Pottery of the Talasea Area, West New Britain Province

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ABSTRACT. Pottery has been found at many locations in the Talasea area of Willaumez Peninsula of West New Britain Province in Papua New Guinea. Most of the pottery belongs to the Lapita ceramic series, and there are only three cases where the pottery represents recent trade wares. The find-spots are situated at beach level and on hills and ridges. Coastal changes caused by tectonic activity and other natural events during the late Holocene, together with human activities, have severely affected many localities. The main pottery sequence is bracketed by the W-K2 and W-K3 tephras. It probably began c. 3370–3140 cal. BP and ended during the period c. 2350–1850 cal. BP. Most pottery was locally produced, though several exotic sherds indicate links with the south coast of New Br…itain. Early sites are located on islands as well as the mainland. Boduna Island might have been used for special, perhaps ritual, activities. After the W-K3 tephra, pottery was not used again in the Talasea area until the last few hundred years, when trade wares were imported from the New Guinea mainland.

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Pottery, mostly attributable to the Lapita ceramic series, has been recorded at more than 60 localities on Willaumez Peninsula and its adjacent islands in West New Britain Province, Papua New Guinea (Fig. 1, Plate 1). Other parts of island Melanesia have clusters of ten or more Lapita sites with the distinctive dentate-stamped decoration and complex vessel forms (Anderson *et* al., 2001: table 1; Specht, 2002: 42), but none matches the density of sites on the Willaumez Peninsula mainland and the adjacent islands. This exceptional concentration is not surprising, as the Talasea area of the Peninsula was one of the major source regions for the obsidian, largely from the Kutau/Bao sub-source, that was transported widely throughout the western Pacific during the time of Lapita pottery (e.g., Torrence, 1992a; Summerhayes *et al*., 1998; Specht, 2002). Recent publications about the Peninsula, however, have focused primarily on the history of procurement, use and movement of obsidian at the sources and beyond over more than 20,000 years (e.g., Torrence *et al*., 1992, 1996; Torrence & Summerhayes, 1997; Summerhayes *et al*., 1998; Araho *et al*., 2002; Rath & Torrence, 2003; Symons, 2003; Torrence, 2003, 2004a, 2004b; Torrence *et al*., 2004). Here we present an overview of the pottery finds

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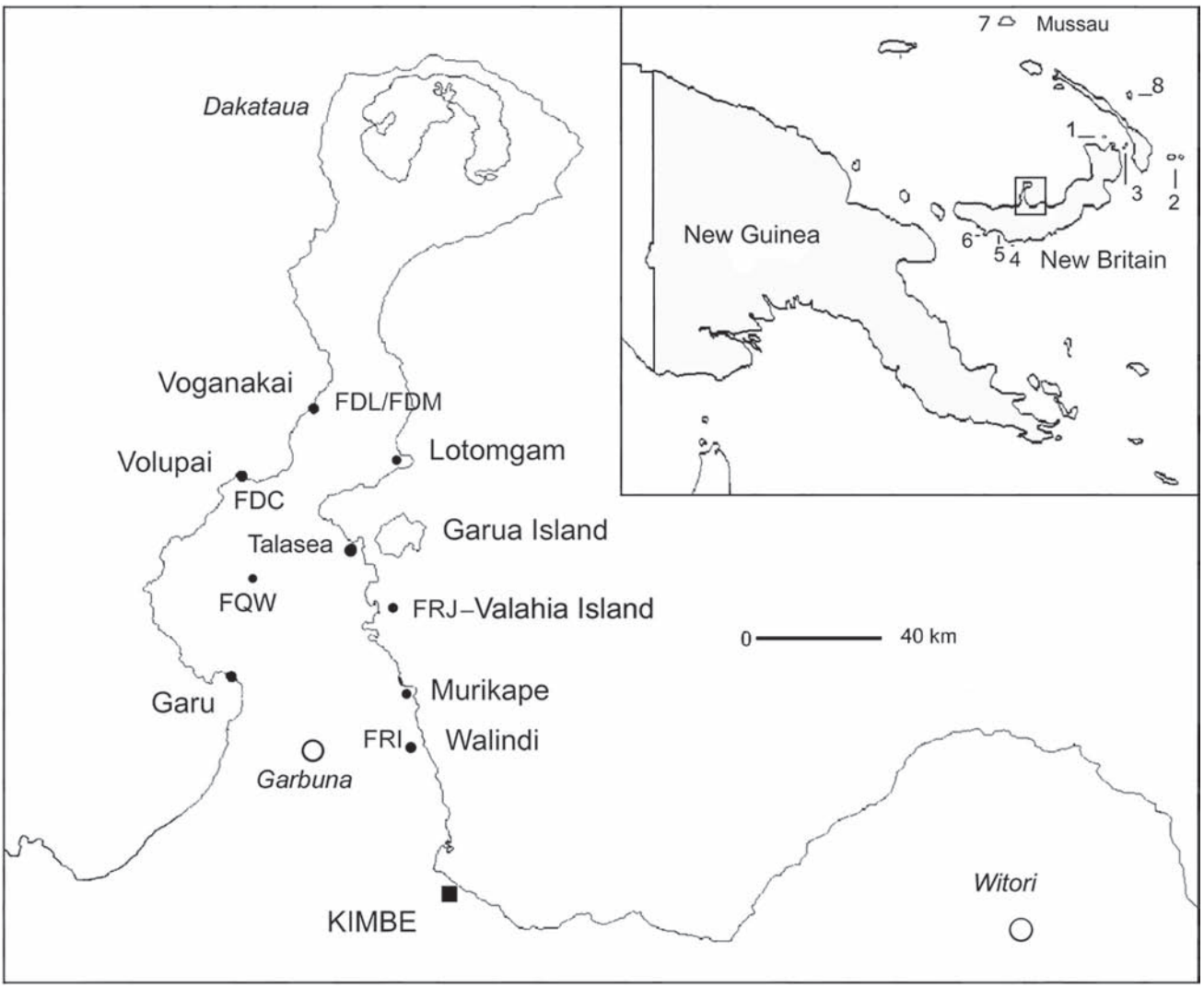

Fig. 1. Willaumez Peninsula, West New Britain, Papua New Guinea showing the location of the Talasea area and pottery find-spots located outside Figs 2A and 2B.

that, in conjunction with separate papers on the FEA and FCR/FCS sites (Specht & Summerhayes, 2007; Specht, 2007), allows a better understanding of the history of pottery making and use in the Talasea area.

Although comparatively few details have been published about the pottery find-spots or their contents, they have not been completely neglected. Anderson *et al*. (2001: table 1) published a summary inventory of pottery sites with dentate-stamped decoration on Willaumez Peninsula, and there have been reviews of the Talasea area in general (Specht *et al*., 1988: 11–12, 1991: 287–289) and of Garua Island in particular (Torrence & Stevenson, 2000; Torrence, 2002), and Spriggs (1997: 122) has offered a general summary. Anson (1983, 1986, 1990) included the FCR/FCS mainland locality in his comparative study of Lapita pottery in the Bismarck Archipelago that led to the recognition of an early ("Far Western") stage of Lapita in the region. Summerhayes (2000a) incorporated material from FSZ on Garua Island in his study of West New Britain Lapita pottery. The FEA site on Boduna Island has been the subject of four separate studies focusing on a range of issues (Ambrose & Gosden, 1991; Summerhayes, 2000a; Torrence & White, 2001; White *et al*., 2002; Specht & Summerhayes, 2007). These locations, however, represent only a small proportion of pottery find-spots in the Talasea area, and to date few sherds have been illustrated.

Preliminary issues

Sites/localities. As used here, the term "site" does not mean that each location was a settlement, be it a single house or an aggregation of houses forming a hamlet or village. Rather, it signifies a find-spot, by surface collection or excavation, of one or more artefacts (in our case, pottery) that presumably mark the location of some past human activity or the result of erosion or other processes. Adopting this approach allows a broad perspective on distribution patterns of human activity and landscape use (Torrence, 2002: 774), without pre-judging the nature of the activities that created the archaeological record (cf. White, 1992).

Pottery terminology. Anderson *et al*. (2001: 2) rightly note an unfortunate tendency in some quarters to use the term "Lapita" as a synonym for "pottery" (and vice-versa), and restricted their inventory to localities known or believed to have pottery with dentate-stamped designs. In contrast, we

take a broader view and deal with all locations that have yielded pottery through excavation or surface collections, irrespective of age or decorative attributes. We include pottery that lacks dentate-stamping, as well as a nearly complete pot and several sherds from trade wares of recent origin. Collectively, these pottery sites are referred to here as the "Talasea pottery sequence."

On the basis of vessel forms and/or decoration, the main part of the Talasea pottery sequence belongs to what has been described as the Lapita ceramic series (Green, 1979: 40; Kirch, 1997: 124). This series has been variously divided into geographical (Far Western, Western, Eastern, Southern) units that extend from the Bismarck Archipelago to Western Polynesia (Green, 1978, 1979; Anson, 1983, 1986; Kirch, 1997: 69–74), and into temporal units of Early, Middle and Late Lapita (Summerhayes, 2001a; 2004: table 2). Green (2003: fig. 3) combines elements of these different approaches in a series of related but divergent local or regional "Lapita traditions" that terminated in Near Oceania with a "Post-Lapita Transition" stage. It is conventional to relate finds of Lapita pottery to one or other of these schemes, according to criteria such as vessel forms, decorative techniques (e.g., the presence or absence of dentate-stamping, the fineness of dentate-stamped impressions) and/or motifs. While this approach has broad utility, we do not follow it here, except where we cite other authors. The criteria are often insufficiently defined in terms of their variability or relative and absolute chronology to allow their reliable application to small, undated samples. This has led to inconsistency in their application, similar to the problems that Anderson *et al*. (2001: 2; cf. Green, 2003) have discussed in the broader context of the use of "Lapita" across the Near/Remote Oceania divide.

For related reasons we do not discuss whether any part of the Talasea pottery sequence constitutes a separate "Lapita tradition" within the broader context of the Lapita ceramic series of Near Oceania (Green, 2003: 103–108, fig. 3). Such a step would require larger, better described and more securely dated pottery assemblages than are currently available in the Bismarck Archipelago.

Dating issues. Only 14C dates are used in the paper, though obsidian hydration dates are available for some sites on Garua Island (Torrence & Stevenson, 2000: table 3). With three exceptions, all dates for the Talasea area have been previously published (Specht & Gosden, 1997; Torrence & Stevenson, 2000; White *et al*., 2002). The three new dates relate to issues of geological rather than archaeological contexts. The previously published dates were originally calibrated using the CALIB 3.0.3 program and the bidecadal atmospheric dataset (Specht & Gosden, 1997: 177; Torrence & Stevenson, 2000: 328). These dates are re-calibrated here with the Marine04.14c (Hughen *et al*., 2004) and Intcal04.14c (Reimer *et al*., 2004) datasets of the CALIB 5.0.1 program (Stuiver & Reimer, 1993 [version 5.0]). We use the Intcal04.14c option rather than SHcal04.14c for Southern Hemisphere terrestrial samples (McCormac *et al*., 2004) because all samples come from within 5–6°S of the equator. As nutshells have a growth life of no more than one year, we employ a 1-year moving average for the sample growth span (cf. Specht & Gosden, 1997: 185; Stuiver *et al*., 2005). For samples wholly or primarily composed of unidentified wood charcoal (Beta-34208, Beta-41590, Beta-102965) we have used a 10-year moving average. The calibrated age results obtained with these protocols frequently differ in detail from the original published versions, and occasionally yield a shorter age range. Age ranges are cited at 2σ for the highest probability distribution value where P = <1.0, and are rounded to the nearest 10-year interval, except where the calibrated result ends with 5. For four pairs of dates we have calculated their pooled means, as the dates in each pair are statistically the same.

There are problems with interpreting some of the dates. A plateau or flat spot on the calibration curve at about 3500–2500 cal. years ago means that it is impossible to indicate where within this plateau the sample's calendar age falls (Blackwell *et al*., 2006: 411). Throughout the paper, therefore, we use age ranges to acknowledge this uncertainty, as well as to reflect the probabilistic nature of 14C dates in general. While this approach does not yield a tight chronology, it avoids the undesirable practice of representing age determinations as points in time.

There is no ΔR correction value in the Talasea area (White *et al*., 2002), and the calculated ΔR values for various parts of the Bismarck Archipelago show considerable variation (Kirch, 2001b; Petchey *et al*., 2004, 2005). This affects the marine shell samples from FEA, and the marine shell and coral samples from Point Mondu. For these we use the default value of $\Delta R = 0 \pm 0$ years for the model surface ocean (Hughen *et* al., 2004).

On the positive side, all Garua Island dates and those for FRI are on carbonized plant materials, mostly nutshell fragments of *Canarium* species that were produced annually and have no in-built age greater than the season within which they grew (Torrence & Stevenson, 2000: 328). As the highly acidic tephra-derived soils of the Talasea area are a poor environment for the survival of organic materials, it often proved impossible to recover datable material during excavation and there are several contexts for which dates are highly desirable but cannot be obtained.

Where we cite dates from other areas, we use the age ranges as they have been reported, irrespective of the calibration program or ΔR values used (e.g., White & Harris, 1997; Kirch, 2001b; Summerhayes, 2001a; Garling, 2003).

The Talasea area: geological context

For the purposes of this paper the "Talasea area" is defined as the central part of Willaumez Peninsula and its adjacent islands between lines drawn across the Peninsula from Lotomgam to Voganakai on the north side of Garua Harbour and from Walindi to Garu in the south (Fig. 1, Plate 1). This includes the "Talasea area," "Garua Harbour" and "Garua Island" entries of Anderson *et al*. (2001: table 1), and extends beyond the southern limit of the Peninsula's obsidian sources (Torrence *et al*., 1992; Bird *et al*., 1997).

Willaumez Peninsula was formed by seismic and volcanic activity resulting from the position of New Britain on a subduction zone at the junction of the Bismarck and Solomon Seas Plates (Denham, 1969; Johnson *et al*., 1973; Ryburn, 1975: 15). The Peninsula runs roughly due north and comprises basaltic to rhyolitic volcanoes of the Quaternary Kimbe Volcanics series (Lowder & Carmichael, 1970; Johnson *et al*., 1973; Ryburn, 1975; Smith & Johnson, 1981). For most of these volcanoes there

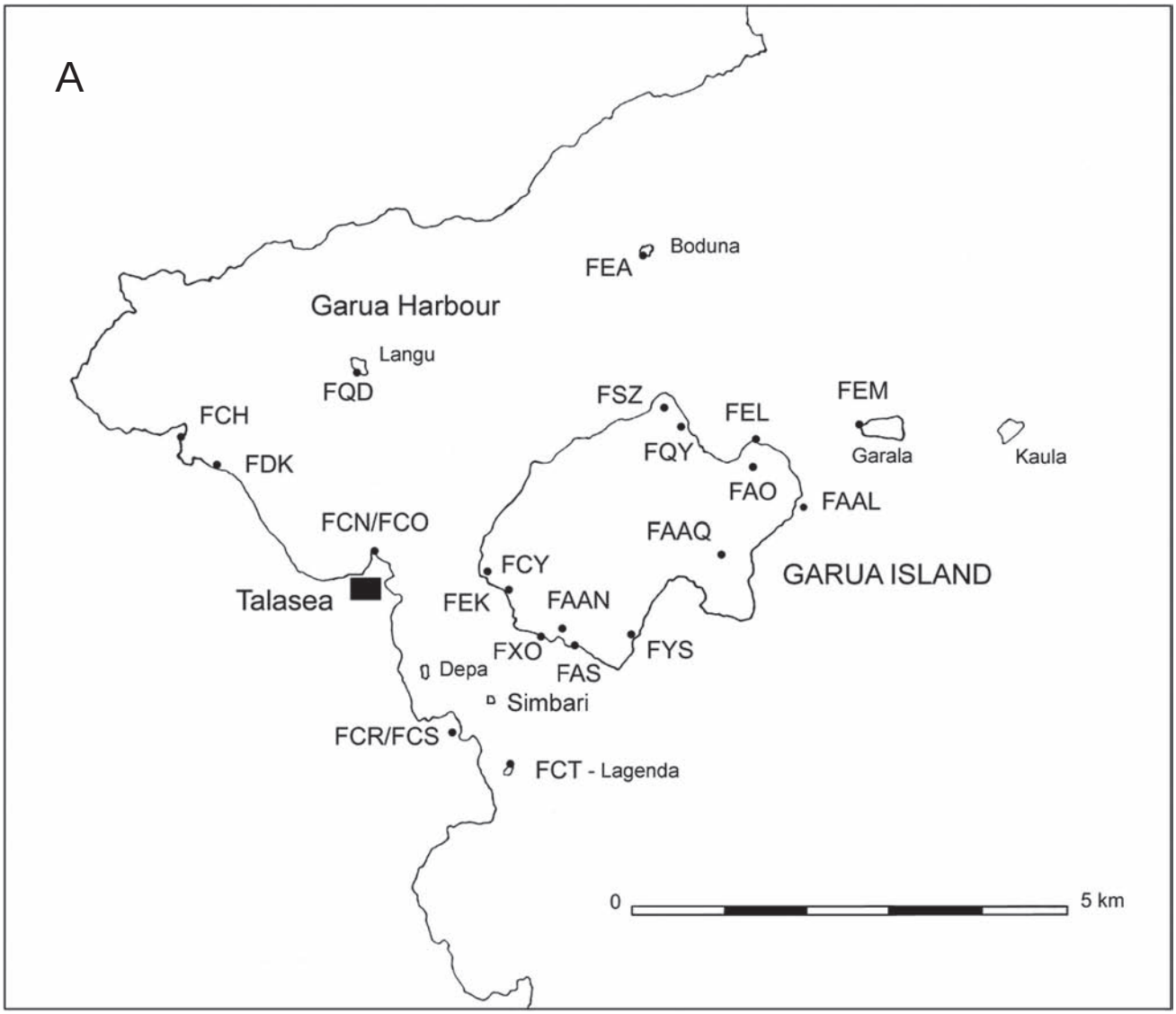

Fig. 2. Locations of pottery find-spots of the Talasea area, West New Britain. (*A, above*) find-spots of sherds with dentate-stamped decoration. (*B, facing page*) find-spots of sherds without dentate-stamped decoration.

are no recent records of eruptions. The exceptions are the most northerly volcano, Dakataua, which was last active in the late 19TH century (Branch, 1967), and Garbuna above Walindi, where there was a minor eruption in the crater's geothermal area in late 2005.

The landscape is dominated by steep ridge and ravine topography, with low-lying areas in-filled with airfall and reworked tephras and other slope-wash materials. These deposits have locally buried fringing coral reefs to form narrow coastal plains. The mean annual rainfall is around 4000–4500 mm (McAlpine *et al*., 1983: 181).

Talasea Township sits on the southern edge of the caldera that forms Garua Harbour, in the eastern entrance of which stands Garua Island (Fig. 2, Plate 2). Several active geothermal areas at beach level and on the slopes around the Harbour form fields of hot mud pools, hot springs, steam vents and sinter beds (Heming & Smith, 1969). To the north and south of Garua Harbour and on Garua and Garala Islands there are flows and secondary deposits of obsidian that have been exploited since the late Pleistocene (Torrence *et al*., 1992; Torrence, 2004b; Bird *et al*., 1997).

Garua and the smaller islands of Garala, Langu and Kaula are of volcanic origin. In contrast, the islands of Boduna, Lagenda and Depa in Garua Harbour, and Valahia to the south consist of emerged coral reef platforms covered with sand, tephras and associated soil development to 1–3 m above sea level. These platforms reflect changes in relative sea level as a result of the mid-Holocene sea highstand or local uplift due to tectonic activity, or both. The Talasea area, together with other parts of north New Britain, may also be subject to subsidence associated with the subduction zone (Wiebenga, 1973: 166; Johnson, 1976).

These interacting and counteracting forces have contributed to a complex history of the coastline during the late Holocene, particularly with regards changes in relative sea level. At Nabodu Beach near Bamba village, a tree root exposed at low tide in 1973 might indicate subsidence (Plate 3). This was dated to 670–420 cal. BP (NSW-85: 520±100; P = 0.905). The root was not identified, but probably represented a tree that grew on dry land. Conversely, oyster shells on rocks and small pinnacles of coral at about 1.1 m above present high tide at Point Mondu,

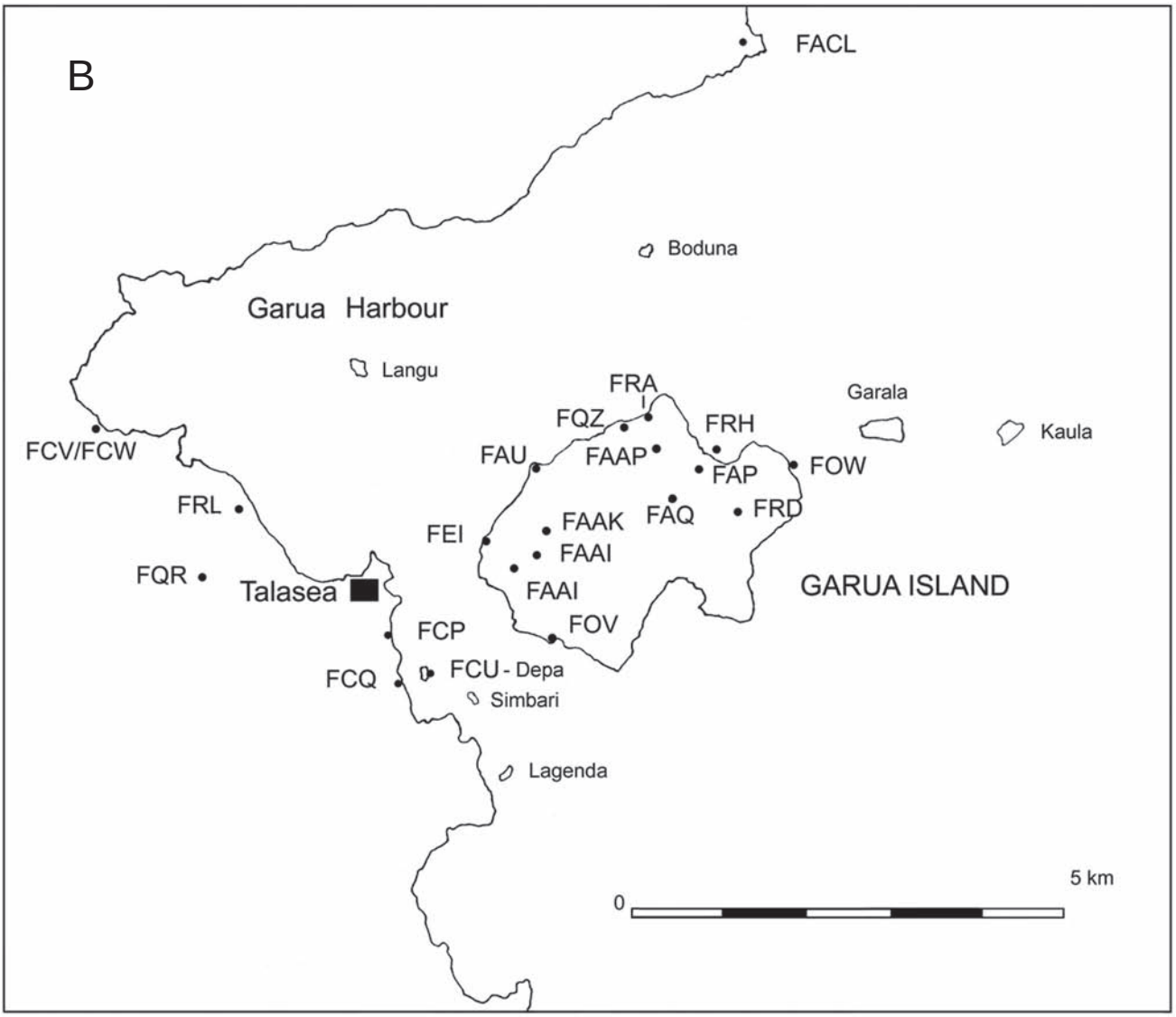

Fig. 2 (continued). Locations of pottery find-spots of the Talasea area, West New Britain. (*A, facing page*) find-spots of sherds with dentate-stamped decoration. (*B, above*) find-spots of sherds without dentate-stamped decoration.

near Talasea wharf suggest a phase of uplift (Plates 2, 4). A sample of the coral is dated to 650±60 bp (Beta-56978), and one of the shells to 630±60 bp (Beta-56979). Boyd & Torrence (1996: appendix 1, phase 6) report the shell date as an uncalibrated age of c. 650 BP. The pooled mean of these results places the uplift phase between 410–185 cal. BP. This uplift probably affected the entire Harbour area, as raised corals near Bamba village, Bitokara Mission and on Kaula Island are at about the same height as the oyster shells at Point Mondu (Plate 5). A raised beach on Garala Island and raised coral on Garua Island at about 0.75 m above present high tide may reflect this uplift phase (Plate 6), particularly as the surface of the Garua coral is eroded (Torrence & Webb, 1992: 14–15; Torrence, 1993a: 11–12).

These phases of uplift and subsidence have had significant impacts on the survival and visibility of coastal archaeological remains in the Talasea area, and must be taken into account in discussions about their location and distribution (cf. White *et al*., 2002: 106). The FCN/FCO location on the low-lying neck of Point Mondu is now 1–2 m above high-tide level (Plates 2, 4), but would have been close to sea level or in the inter-tidal zone prior to uplift. Point Mondu itself might have been a small island that became joined to the mainland as a result of uplift and the trapping of sediments between the island and mainland. Currently, there appears to be a renewed phase of uplift, as small islets of coral reef have emerged to about 0.5–1 m above high tide level in Garua Harbour since 1973 and now carry vegetation (Plates 1, 6). The uplift has affected the FCH locality at Bamba village, which was in the inter-tidal zone in 1972–73 but was above high-tide level in 1988.

Recording methods and the catalogue

The catalogue (Appendix 1) is a compilation of published and unpublished information from fieldwork by Specht since 1973 and by Torrence since 1992. It presents the main features of 47 pottery find-spots identified by the three or four letter codes assigned by the National Museum and Art Gallery of Papua New Guinea, Waigani. Many are listed in the National Museum's review of archaeological sites in West New Britain Province (Swadling *et al*., 1992), in

the Anderson *et al*. (2001: table 1) inventory, or discussed generally by Specht *et al*. (1988, 1991) and Torrence & Stevenson (2000; cf. Torrence, 2002). All listed localities have been visited with the exception of Murikape, the modern cemetery of Patanga village. As we have been unable to obtain permission to visit Murikape to verify the reported finds, it has not been allocated a code. Anderson *et al*. (2001: table 1) incorrectly list Murikape as FEB, which is an inter-tidal obsidian flaking area without pottery situated between Patanga and Bola villages (Specht & Koettig, 1981).

The localities were recorded over several decades in the course of different projects and under varying circumstances. The pottery samples reflect these changing priorities and approaches, and vary enormously in quality and size. They are not an ideal data set for studying the distribution and content of pottery finds, but some patterns can be derived from them and a generalized chronological sequence outlined.

Where available, local names were recorded for the pottery find-spots. This was not always possible, especially on Garua Island, which has been a coconut plantation since 1923 (Hore-Lacey, 1992: 14–15). Consequently, some localities on Garua are identified by names assigned by plantation workers or archaeologists.

Within the Talasea area, large parts of the inland region and the east coast south from Bola village have not been surveyed, and the total of 47 localities reported here is a minimum figure. Even in areas that have been intensively covered, the topography, dense vegetation, deep deposits of airfall tephras and erosion sediments, roads, cemetery areas, houses and official buildings, or restrictions on access frequently hindered survey work. Some pottery localities have been buried by several metres of tephra or slope-wash, and their recognition has depended on chance exposure by erosion or construction works. FCR/FCS at Lagenda near Bola village was identified in 1973 by the discovery of sherds in the crushed coral (*koronas*) road surface between Talasea and Bola (Specht, 1974). Inquiry at the District Office revealed the source of the *koronas* as a quarry at Lagenda. This quarry had mined the coral limestone platform under the pottery site, and some sherds became incorporated in the *koronas* used for road surfacing. When the area was inspected in 1973, the FCS locality had been destroyed. By 1981, quarrying had been extended into the FCR area (Specht *et al*., 1981: 8). FCN/FCO on Point Mondu has suffered a similar fate (Specht, 1974). Crushed coral also forms the road surface at Bitokara Mission (Plate 1), and several small sherds found on the road near the church (listed as FRL) may have come from Lagenda or Point Mondu, as no pottery of any kind was recovered from the nearby excavation (Specht *et al*., 1988). On Garua Island the FSZ site was identified as a result of bulldozer clearance of overburden from a scoria cone used as a quarry for road building material (Plate 7). Although a large part of the scoria cone had been removed by the time pottery was first recorded there, a rescue excavation was possible on the remaining part of the hill (Torrence, 1992b, 1993a, 1993b, 1993c; Torrence & Stevenson, 2000; Summerhayes, 2000a).

Local residents reported some pottery finds to visiting archaeologists or to the West New Britain Provincial Cultural Centre in Kimbe (e.g., FEA, FQR, FRI, FRJ, and Murikape). Other localities were identified by walking along accessible foreshores or by inspecting exposures. On Garua Island, many find-spots are the result of test pits excavated as part of a landscape sampling strategy (Torrence, 2002). The most southerly and inland locality, FQW in the Kapugara Oil Palm Development area, was recorded during a visit to an ancestral site of the Bakovi people of the Talasea area (Specht *et al*., 1991: 289).

When the first surveys were conducted in 1973–74, residents of Talasea reported that visiting geologists had suggested that the area was subject to subsidence. This encouraged survey in the inter-tidal zone and adjacent shallow water at low tide, in the expectation that subsidence would have forced beach locations underwater. This strategy was very successful, and pottery and obsidian flakes have been found at or below high tide level at 23 localities, though some of these represent materials re-deposited from higher ground. The western end of Garua Harbour near the former airstrip and the adjacent northern shore consist of deep mudflats and swamps where survey is impossible. Much of the foreshore at Talasea itself was also not surveyed, as it is an active geothermal area that extends inland up the slopes behind the beach (Heming & Smith, 1969).

Pottery locations and site areas

The changes in coastal landscapes resulting from uplift or subsidence, and the blanketing effect of tephra falls and their subsequent erosion over the last 2000 years mean that the nature of present-day pottery locations differs greatly from conditions prevailing when the pottery was discarded. This prevents the kind of detailed analysis used by Lepofsky (1988), and a more general approach is adopted here.

Tables 1 and 2 summarise the main features of the find-spots, which are divided into those with dentate-stamped decoration and those without it. In Table 2 there are two entries (FQR, FQW) in the "Recent" column, which refers to pottery that can be assigned on stylistic grounds to a recent period well after the end of the Lapita ceramic series; no other pottery was found at these two sites. For four other entries in Tables 1 and 2 a question mark indicates the possible presence of sherds of recent pottery.

The "Position" column indicates the general landform on which a find-spot is located. A "coastal hill" refers to a hill or escarpment above a coastal plain, usually within a few hundred metres of the beach, or a hill that rises directly from the sea or beach (e.g., FAO and FSZ, Plates 7, 8). In contrast, "inland hill" and "inland upland" are locations at least 0.5 km from the sea (e.g., FRD and FRI, Plates 7, 9). The term "beach" includes land above high tide level and extending over the berm. "Inter-tidal" includes parts of reef flats and other areas that are not exposed at low tide, such as the lagoon floor at Boduna Island (White *et al*., 2002).

Most pottery find-spots are on islands in Garua Harbour or on the surrounding mainland. Seven of the nine islands visited yielded pottery, with a total of 32 localities. Six small islands (1–6 ha) each have one pottery scatter, but Garua (c. 9 km^2) has 26, reflecting its greater size and the concentration of fieldwork there since 1988. The islands without pottery are Kaula and Simbari. Pottery was found at only two locations on the western side of the Peninsula, which was surveyed on foot from north of Voganakai to just south of Volupai (FDC, FDL/FDM, Table 2). Each surface collection yielded only seven sherds. This probably reflects the exposed nature of most of this coastline, which is open to the force of storms

Table 1. Inventory of localities with dentate-stamped pottery in the Talasea area.

site	village or area	local name	position	sherd count	dentate stamp	inc./plain stamp	nail imp.	circle imp.	exc. Δ	shell imp.	punctate imp.	applied relief	cut-out	scallop lip	notch lip	recent
FCH	Bamba	Witere/Nabodu	Beach/intertidal	21	●	—	—	●	—	—	—	—	—	●	●	—
FCN/FCO	Talasea	Point Mondu	Beach/intertidal	7	●	—	—	—	—	—	—	—	—	—	—	—
FCR/FCS	Bola	Lagenda	Beach/intertidal	c. 750	●	●	●	●	●	—	—	—	—	●	●	—
FCT	Bola	Lagenda Island	Beach/intertidal	47	●?	—	—	—	—	—	—	—	—	—	—	—
FCY	Garua I.	*n.a.*	Beach/intertidal	16	●	—	—	—	—	—	—	—	—	—	●	—
FDK	Bitokara	Nariri	Beach/intertidal	1	●	●	—	●	—	—	—	—	—	—	—	—
FEA	Pangalu	Boduna Island	Beach/intertidal	>8,000	●	●	—	●	●	—	●	●	●	●	●	?
FEM	Pangalu	Garala Island	Beach/intertidal	>50	●	●	—	—	—	—	—	—	—	—	●	—
FQD	Bamba	Langu Island	Beach/intertidal	29	●	●	—	—	—	—	—	—	—	—	●	—
FRJ	Pasiloke	Valahia Island	Beach/intertidal	33	●	●	—	—	—	—	—	—	—	—	●	—
FYS	Garua I.	*n.a.*	Beach/intertidal	112	●	●	—	—	—	—	—	—	—	—	●	—
FAO	Garua I.	*n.a.*	Coastal hill	676	●	●	●	●	—	●	●	●	—	●	●	—
FQY	Garua I.	Gola's Gully	Coastal hill/plain	106	●	●	●	●	—	—	—	—	—	—	●	—
FSZ	Garua I.	Scoria Pit	Coastal hill	>4550	●	●	●	●	—	●	●	●	—	●	●	—
FAAN	Garua I.	*n.a.*	Coastal plain/hill	121	●	—	●	—	—	—	●	—	—	—	●	—
no code	Patanga	Murikape	Coastal hill	1	●	—	—	—	—	—	—	—	—	—	—	—
FRI	Walindi	Puro	Inland upland	>30	●	●	—	●	—	—	—	—	—	—	—	?
FAAQ	Garua I.	*n.a.*	Inland hill/upland	170	●	●	●	—	—	●	—	●	—	●	●	—
re-deposited?																
FAS	Garua I.	*n.a.*	Streambed	10	●	—	●	—	—	—	—	●	—	—	●	—
FEK	Garua I.	Mt America	Intertidal	8	●	●	—	—	—	—	—	—	—	—	—	—
FEL	Garua I.	Mangrove Pt	Beach/intertidal	>100	●	●	●	—	—	—	—	●	—	●	●	—
FXO	Garua I.	*n.a.*	Beach/intertidal	74	●	●	—	—	—	—	—	—	—	—	●	—
FAAL	Garua I.	*n.a.*	Beach/intertidal	6	●	●	●	—	—	—	●	—	—	—	—	—

Table 2. Inventory of localities without dentate-stamped pottery in the Talasea area.

site	village or area	local name	position	sherd count	incised	nail imp.	punctate imp.	relief	shell imp.	scallop lip	notch lip	recent
FCP	Bola	*n.a.*	Beach/intertidal	4	—	—	—	—	—	—	—	—
FCQ	Bola	Lagenda	Intertidal	3	—	—	—	—	—	—	—	—
FCU	Bola	Depa Island	Beach/intertidal	4	—	—	—	—	—	—	—	—
FCV/FCW	Bamba	*n.a.*	Beach/intertidal	46	●	—	—	—	—	—	—	—
FDC	Volupai	Bele	Beach	7	?	—	—	—	—	●	—	?
FDL/FDM	Voganakai	*n.a.*	Coastal hill	7	—	—	●	—	—	—	●	—
FAAJ	Garua I.	*n.a.*	Coastal hill	21	●	●	—	—	—	—	●	—
FAQ	Garua I.	*n.a.*	Inland hill	3	—	—	—	—	—	—	—	?
FRD	Garua I.	Mt Baki	Inland hill	4	—	—	—	—	—	—	●	—
FAAP	Garua I.	*n.a.*	Inland hill	2	—	—	—	—	—	—	—	—
FQR	Ngarumatala	Nahaba	Inland upland	1	●	—	—	—	—	—	—	●
FQW	Kapugara	Beto (Poeto)	Inland upland	1	●	—	—	—	—	—	—	●
FAAI	Garua I.	*n.a.*	Inland upland	2	—	●	—	—	—	—	●	—
FAAK	Garua I.	*n.a.*	Inland upland	2	●	—	—	—	—	—	—	—
FACL	Lotomgam	*n.a.*	Inland upland	4	—	—	—	—	—	—	—	—
re-deposited?												
FAP	Garua I.	Malaiol stream	Streambed	1	—	—	—	—	—	—	—	—
FRA	Garua I.	*n.a.*	Streambed	2	—	—	—	—	—	—	—	—
FAU	Garua I.	Point Doro	Beach/intertidal	1	—	—	—	—	—	—	—	—
FEI	Garua I.	*n.a.*	Beach/intertidal	>16	—	—	—	—	—	—	—	—
FOW	Garua I.	*n.a.*	Beach/intertidal	<50	—	—	—	—	—	—	—	—
FRH	Garua I.	Compound reef	Intertidal	2	—	—	—	—	—	—	—	—
FQZ	Garua I.	Pumping station	Coastal plain	2	●	—	—	—	—	—	—	—
FOV	Garua I.	*n.a.*	Coastal hill	9	—	—	—	—	—	—	—	—
FRL	Bitokara	Church road	Coastal hill	3	—	—	—	—	—	—	—	—

Table 3. Summary of geographical contexts of pottery sites in the Talasea area, according to the presence or absence of dentate-stamped sherds. The "recent" column includes sites where only sherds of recent trade wares are present.

	dentate	undiag.	recent	totals
re-deposited?	5	9	0	14
beach/intertidal	11	4	0	15
coastal hill	5	3	0	8
inland hill	0	3	0	3
inland upland	2	3	2	7
totals	23	22	2	47

and heavy seas during the northwest wet season. Today, this coastline has few settlements at beach level or on hilltops, and the main focus of population on the Peninsula is on the more protected eastern coast and its hinterland.

Pottery was recovered from a range of settings not usually considered to be associated with the Lapita ceramic series, such as at more than 160 m above sea level on top of Mt Baki on Garua (Plate 7; Torrence, 2002: 771, fig. 5). Setting aside the 14 localities that are considered to be re-deposited, 18 localities are on hills and ridge tops and ten are some distance from the sea (Table 3). At the "inland-upland" sites of FQR and FQW the pottery is clearly not related to the Lapita ceramic series, but in other cases the affiliation of the pottery is less clear. Dentate-stamped sherds were recovered at five localities on coastal hills and at two inland/upland hills (Tables 1, 3).

Of the 26 pottery localities on Garua, twelve find-spots are on hills or ridges (two of which extend to the coastal plain), ten are on beaches or in the inter-tidal zone, and four are on the coastal plain in gullies and streambeds. On the Peninsula mainland eight localities are on beaches or in the inter-tidal zone, three are on hill or ridge tops close to the sea, and four are 0.5 km or more inland. The remaining six sites are on small islands.

"Re-deposited" sites. Fourteen entries in Tables 1 and 2 are listed under the heading "Re-deposited?" The FRL locality at Bitokara Mission on the mainland was discussed above. The other 13 are on Garua Island, where eight find-spots were associated with outwash fans at beach level, three were in streambeds, one was associated with construction work for a water-pumping station on the coastal plain, and one (FEL) was probably formed by landslide deposits from the hill on which FAO is situated (Specht & Gosden, 1997: 177). The large number of re-deposited find-spots on Garua reflects the erosion of the island's steep topography as a result of human and natural impacts (Boyd & Torrence, 1996).

Artefact scatters in the inter-tidal zone or shallow water are not necessarily the result of re-deposition or changes in relative sea level. Parts of some Lapita sites in the Mussau Islands off northern New Ireland (Kirch, 1988; 2001a: 130–134) and the Arawe Islands of southwest New Britain (Gosden & Webb, 1994) consisted of stilt structures over the fringing reef. In the Talasea area it is often not clear whether the pottery scatters in the inter-tidal zone and shallow water represent similar sites, dry-land sites that were later submerged, material re-deposited from higher ground, or a combination of these. The high degree of weathering of finds in the inter-tidal zone and shallow water suggests that they have been subjected to attrition by sea action over a long period, perhaps being exposed and submerged several times since deposition.

Site areas. The definition of site areas was often arbitrary, as there were rarely clearly defined concentrations of cultural materials (cf. Torrence, 2002: 774), and the total of 47 sites listed here could easily be increased or decreased according to individual recorder preference. Furthermore, many find-spots listed in Tables 1 and 2 consist of only a few surface finds. In the Catalogue and Tables 1 and 2 we have amalgamated some adjacent locations on the mainland that were initially allocated separate codes, as the scatters of obsidian and sherds were essentially continuous distributions. On Garua Island, there were "virtually no empty patches" in 177 "landscape samples" covering three periods from 69 test pits across the island, with pottery occurring in about half of them (Torrence, 2002: 769–771). These widespread occurrences could be the result of human activities or erosion, or both. Given the uncertainty about the limits of individual artefact scatters, particularly where these occur in the inter-tidal zone, definition of the extent of a site is problematic. There are also issues about whether a scatter reflects the actual area over which a particular human activity took place, and the length of time over which a particular scatter was formed. The site areas discussed below, therefore, should be treated as provisional.

Anderson *et al*. (2001: table 1) provide area estimates for FAO, FEA and FSZ. The estimates for FAO and FSZ (both 1600 m^2) are too low, as part of the hill on which FAO stands collapsed during the twentieth century, and part of FSZ was removed by quarrying prior to recording. In each case, the original size of the site cannot be calculated, but was certainly larger than its current extent and was perhaps 3,000 m^2 or more. The only cases where we can be reasonably confident about size are on small islands. On Boduna Island the artefact scatter of FEA covers the entire island and extends into the sea (White *et al*., 2002). The island has a land area between 6,000 and 10,000 m^2 (Ambrose & Gosden, 1991; Anderson *et al*., 2001: table 1; White *et al*., 2002: 101). These figures are an underestimate, as they do not include the inter-tidal and lagoon floor components; the total area is probably closer to 11,000–12,000 m^2.

Lagenda Island (FCT) is about 175 m long and 75 m wide, and sherds were found only in the inter-tidal zone and none on land. FCT, therefore, is likely to be at most no larger, and possibly smaller than FEA. The extent of the sites on Depa (FCU), Garala (FEM), Langu (FQD) and Valahia (FRJ) Islands is also difficult to estimate. As with Lagenda Island, sherds were not found over the entire surface of each island, but did occur in the inter-tidal zone. On Garala, the largest (about 6 ha) of these islands, sherds were found mostly on the low-lying western end facing Garua Island or in the adjacent inter-tidal zone, covering an area of about 3–5,000 m^2. The other three islands have land areas of about 1 to 3 ha, and in each case the artefact scatters cover much less than 10,000 m^2. The size of the now-destroyed FCR/FCS site on the mainland also cannot be estimated accurately, but was probably not larger than 10,000 m^2 (Specht, 2007).

These estimates suggest that the areas of the pottery sites were in the range 3,000–12,000 m^2. This range falls

comfortably within those known for many open Lapita sites elsewhere in Island Melanesia and Western Polynesia (Sheppard & Green, 1991: fig. 18). None approaches the size of site ECA in the Mussau group, which is variously given as 72,500 m^2 (Kirch & Hunt, 1988: table 2.1) and 82,000 m^2 (Kirch, 1997: 167), though this large area is clearly the result of activities carried out over several hundred years.

Garden land and fresh water. With land areas of about 1–2 ha, Boduna, Depa and Valahia are the smallest and lowest of the islands with pottery. The limited land surfaces of these and the other three small islands with pottery (Lagenda, Langu and Garala) could support only limited resources necessary for subsistence and social activities. If the archaeological materials from these small islands reflect permanent settlements, even at the individual household level, their occupants would have required access to garden land on Garua or the mainland, or would have had to import food. An alternative possibility is that the small islands were not used regularly for habitation, though people living on the mainland or on Garua could have maintained fruit trees and periodically made gardens on the islands, as was observed on Langu in 1988.

Fresh water sources were recorded at beach level at various points around Garua and at FCH, FDK and FCV/FCW, and there are small rivers near FCR/FCS and the inland site of FQW. Small seeps and springs probably exist at other beach level locations and these would have served non-coastal locations, as there are no perennial surface streams or pools in most inland areas. During our work at Bitokara Mission (FRL) in 1988, there was a daily procession of women from hamlets above Bitokara to Nariri beach (FDK) for washing clothes and pots and collecting drinking water. This involved a walk of one or more kilometres in each direction, with a descent of about 40–80 m followed by a similar ascent to bring home the family water supply. A comparable walk would have been necessary at FRI, though the position of the beach during the Lapita period is not known (Plate 9). Thus, proximity to fresh water was not necessarily a constraint on settlement location.

Finds at the pottery localities

Materials of organic origin such as mollusc shells and bones were found at some surface find-spots, but were present in only very small quantities in the excavated sites, as organic materials survive poorly in the acidic soils and high rainfall of the Talasea area.

Stone artefacts. Most find-spots yielded obsidian artefacts, and several surface collections (e.g., FAP, FCH, FCR/FCS, FEK, FAAL) include whole or broken stemmed and bifacially worked obsidian tools (e.g., Specht, 1973: 446; 1974: figs 2–3; Araho, 1996; Araho *et al*., 2002: fig. 13; White *et al*., 2002; Rath & Torrence, 2003; Torrence, 2003, 2004a). As these forms are mostly older than the earliest pottery in the Talasea area, they are not considered further here. A Type 1 stem and three Type 2 tools were found in late, re-worked contexts at FEA (Ambrose & Gosden, 1991; Specht & Summerhayes, 2007; Kononenko & Specht, in prep.).

Five flaked stems of tools made from rocks other than obsidian were found at FAP, FEK, FCN/FCO (Specht, 1974: fig. 4) and FCR/FCS (Specht, 2007). These and fragments of ground stone tools, mostly axe and adze blades, are listed in the catalogue with petrological identifications by Julian Hollis. The short stem found at FCR/FCS is made on a unifacial thick flake and has a flat poll. Only a small part of the blade is preserved, and the facet created by the break appears to have been used as a scraper or chisel (N. Kononenko, pers. comm.). The other stems have more pointed polls and are bifacially flaked. The relationship between these stems and the pottery finds is uncertain. At FEK and FAP the stemmed finds are clearly re-deposited, but a pottery association cannot be ruled out for the other items, as similar stems occur as surface finds with dentate-stamped pottery at FNT (Kreslo; Specht, 1991: fig. 9d) and FFS (Apugi Island; unpub.) on the south coast of New Britain. One stem was recovered from Kaula Island, where pottery has not been found.

Pottery. Tables 1 and 2 indicate how much pottery was recovered at each locality. In some surface collections the sherds represent all that were present, but in other cases only those displaying aspects of form or decoration were collected. Some localities have been visited several times, and in the case of FEA the samples available for study include finds made by local residents and other visitors over several decades.

The largest collection of sherds, other than those from FAO, FEA and FSZ, is from FCR/FCS (c. 750 sherds), which was made during visits in 1973, 1974, 1980 and 1988. Anson (1983: 29, appendix III) included 58 of the 1973–74 sherds in his study of Bismarck Archipelago Lapita pottery. These represent only a small proportion of the finds, partly reflecting further collecting, and partly Anson's omission of sherds too small or weathered to be of value to his study. Over half (26/47) of the localities yielded ten or fewer sherds, and at 16 of these the sherds are re-deposited. While such small samples obviously restrict what can be said about these localities, they do provide an important contribution to the general distributional picture of pottery-bearing sites in the Talasea area, and indicate how sample size affects the records for decorative techniques in each assemblage.

The small number of finds from inter-tidal contexts (apart from FEA) is not necessarily a reflection of small-scale or short duration use or deposition. Recent work in the New Georgia group, Solomon Islands suggests that a very high proportion of material deposited in such contexts is likely to be lost through the erosive action of the sea, so that what survives is a distorted sample of the original content (Felgate, 2001: 48, 56; 2003: chapters 6–7).

Selected sherds are shown on Figures 3–15, arranged by site code sequence. Some very small rims and decorated sherds, and some sherds illustrated elsewhere are omitted. Summerhayes (2000a: figs 9.2–9.4) illustrates 31 sherds from the 1992 season at FSZ and one from FAO; details about the FSZ excavation contexts are provided in Appendix 2. Torrence *et al*. (1990: 462) illustrate four sherds from FAO and FRI. The FEA finds are covered in several publications (Ambrose & Gosden, 1991; Torrence & White, 2001; White et *al*., 2002; Specht & Summerhayes, 2007). Details about FCR/FCS are presented in Anson (1983) and Specht (2007).

Construction. The weathered condition and small size of most sherds limit discussion of how the vessels were made, but thick rims, carinated shoulders and flat bases at FDK, FEA, FCR/FCS and FQD were formed by joining pieces or slabs of clay (Poulsen, 1987 vol. 2: fig. 61; Sand *et al*., 1996: fig. 32, 1999: 22). This technique facilitated the construction of complex vessel forms that could not be achieved by the paddle-and-anvil technique, and probably provided additional strength to the vessel during the pre-firing drying stage. Several sherds with rounded depressions on their interior suggest that the paddle-and-anvil technique was used for round-bodied vessels and the round bases of complex forms.

Most sherds excavated at FEA and on Garua Island, and in the surface collection from FCR/FCS have red-brown cores, but some dark grey cores occur in all collections, especially those from inter-tidal contexts. Sherd surfaces are brown to red-brown, but a few are blackened by "smudging" during firing or from use in cooking, and some have uniformly dark grey surfaces and cores.

Several dentate-stamped and plain sherds at FCR/FCS and FEA have slips that fall in the "red" ranges on the Munsell colour chart: 5R 4/6, 7.5R 4/6, 7.5R 5/8, 10R 4/6, 10R 4/8, and 10R 5/6. At ECA Area A, Kirch (2001a: 85) recorded a similar red slip as 10R 4/6. These slips occur on plain rim and body sherds as well as dentate-stamped sherds, though relative frequencies have not been calculated because surface damage has probably removed the slip from many sherds. On dentate-stamped sherds the slip was applied after the design had been executed. The slips are mostly confined to the exterior surface, but one dentate-stamped rim at FCR/FCS has red slip on both the interior and exterior (Specht, 2007: fig. 4f). A dentate-stamped shoulder from FSZ is painted with a narrow band of red pigment or slip (Fig. 12af). Two sherds at FCR/FCS have traces of a yellowish-white substance in the dentate impressions that might be a deliberate application; the original colour might have been white, with the present colour being the result of post-depositional staining (Specht, 2007: figs 7k, t). Several sherds at FAO have a slightly striated surface reminiscent of the "brushed" pottery on Watom, but the striations are not so marked (Green & Anson, 2000: 72, fig. 13h–j). The scarcity of this surface finish in the Talasea area suggests that it was probably an accidental result of smoothing the vessel surface prior to firing.

No hardness tests have been carried out, but there is considerable variation within and between collections. The excavated sherds from FEA are soft and friable, whereas those from the site's underwater or inter-tidal contexts are very hard. This difference in hardness may be the result of the burial environment, but at FAO several thin, dark grey sherds from layer 3 spit 3 in pits 989/1010 and 990/970 are very hard, and contrast strikingly with others in the same stratigraphic units that are soft and friable. It is not clear whether this contrast reflects difference of age or composition. These hard sherds are further discussed below in the context of incised decoration, where some are compared with Type Y in the Siassi Islands (Lilley, 2002: 86), and others with pottery from Tanga Island (Garling, 2003).

Compositional studies. Composition studies have concluded that most of the pottery was made from local clays and volcaniclastic sand tempers (Hollis, 1983; Anson, 1983; Lohu, 1983; Dickinson, 1997; Summerhayes, 2000a; Specht & Summerhayes, 2007). Summerhayes identified six composition groups at FEA: two major groups of "light (feldspars)" and "pyroxene = light," and four minor ones of "magnetite," "pyroxene," "calcareous" and "inclusion free" (Summerhayes, 2000a: 145–149, table 9.8; Specht & Summerhayes, 2007: table 8). The two major composition groups and two minor ones ("calcareous" and "inclusion free") are probably of local Talasea area origin, though it is not clear whether they indicate separate production centres or the variability of volcaniclastic sand tempers at any locality. At FSZ, Summerhayes (2000a: 144) recorded "a uniform fabric composition" equivalent to the "light (feldspars)" group of FEA, and concluded (2000a: 225) that this is also of local origin.

Small pieces of obsidian in sherds at FAO, FEA and FSZ have been assigned by PIXE-PIGME to the Gulu source, suggesting a production centre on the northern side of Garua Harbour, or the transport of raw materials to Garua and Boduna (Specht *et* al., 1991: 288; Summerhayes *et al*., 1993: 63; Torrence & Summerhayes, 1997: 80; Summerhayes, 2000a: 170). The absence of obsidian inclusions in sherds from FCR/FCS could indicate a separate production centre on the south side of Garua Harbour. In view of "the vagaries of drainage basin geometry" in the area (Dickinson, 1997), and without indicators such as obsidian inclusions, precise definition of the number and location of production centres will be difficult.

The few "magnetite" and "pyroxene" sherds probably came from pots imported from the southwest coast of New Britain (Summerhayes, 2000a: 170, 211, fig. 11.36).

Recent pottery. There are two definite and four possible cases where the composition, vessel form or decoration suggests that the pots belong to a period after the Lapita ceramic series or originated from recent pottery industries on the mainland of Papua New Guinea. A surface sherd from the Bakovi ancestral village of Beto (FQW), occupied during the 20TH century, is probably part of a pot imported from the Sio-Gitua production centres in Morobe Province (Fig. 3a; May & Tuckson, 1982: 151–155). At Nahaba hamlet (FQR) inland from Bitokara Mission, villagers constructing a new house found an almost complete bowl just below ground surface (Fig. 3b). This is stylistically similar to vessels of the Watut Valley, Morobe Province (Fischer, 1962; May & Tuckson, 1982: 145).

On the basis of fabric, a plain sherd from FRI (Specht *et al*., 1991: 289) and possibly one from FDC could be from recent Madang pots. In 1988, a modern trade pot from Madang was seen at Ngarumatala village near Bitokara Mission (Torrence *et al*., 1990: 461). A surface sherd at FAQ on Garua Island may also be of recent origin (Torrence & Stevenson, 2000: 327). A unique rim sherd from FEA has an incised curvilinear design with punctations on the top of the horizontal rim (Specht & Summerhayes, 2007: fig. 13b). Its affiliation is uncertain, but it is resembles an incised and punctate rim from the KAM site near Finschhafen at the southern end of Huon Peninsula collected by Specht in 1969. Most of the sherds found at KAM are of Type X, now dated to about 1000–500 cal. BP (Lilley & Specht, 2007), and the FEA sherd may be of similar age.

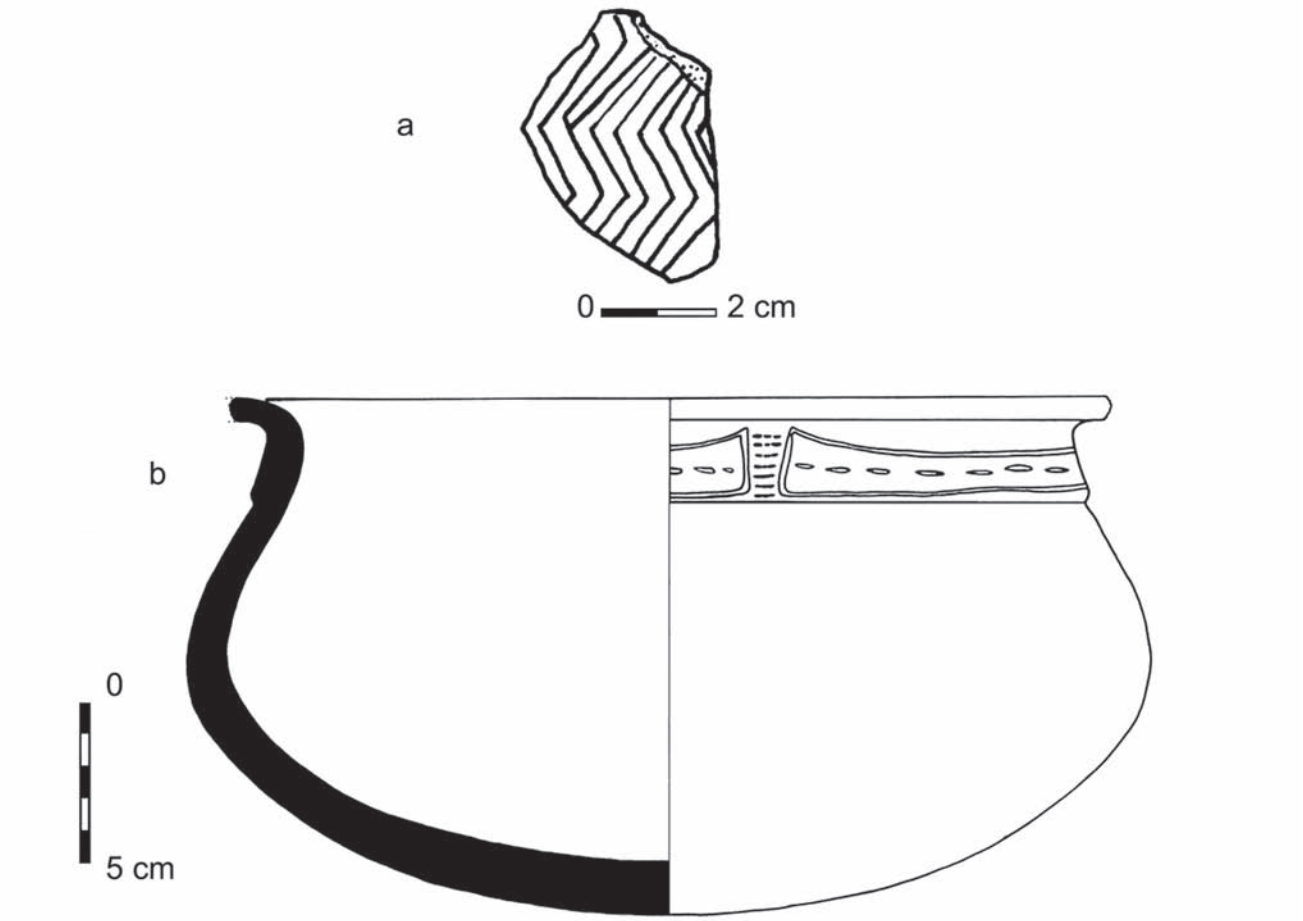

Fig. 3. Non-Lapita sherds. (*a*) FQW, surface (for location, see Fig. 1). (*b*) FQR, unstratified (for location, see Fig. 2B).

Vessel forms. All eight vessel forms defined for the Arawe Islands (Summerhayes, 2000a: figs 4.1–4.3; 2000b: figs 3–5) are represented in the Talasea area:

- I—open bowls and cups with outward rims/walls
- II—open pots or bowls with vertical rims and walls
- III—possible open bowls with horizontal rims
- IV—jars with restricted necks and horizontal rims
- V—jars with out-curving rims, restricted necks, carinated shoulders and round bases
- VI—pots with everted rims and rounded bodies and bases
- VII—vessels with inward, restricted upper bodies, including narrow necked vessels and in-curving bowls
- VIII—vessel stands.

The distribution of identifiable vessel forms is shown on Table 4. As many sherds are too small to identify vessel forms with certainty, and at some sites several rim sherds might be from the same vessel, the Table shows only presence or absence: "●" indicates definitely present, "(●)" probably present, and "○" uncertainty whether the form is II or VII.

Anson (1986: 161) did not identify flat-based bowls at FCR/FCS, but this form is certainly present at FCH (Fig. 6g), FCR/FCS (Specht, 2007: fig. 4a–c), FEA (Specht & Summerhayes, 2007: figs 5b, 9c, 12b–e), FEM (Fig. 8c) and FSZ (Fig. 13ab; cf. Summerhayes, 2000a: fig. 9.2 sherd 3056, where it is shown as a shoulder, but could be a flat base).

We divide vessel stands into two groups: VIIIA freestanding pot stands, and VIIIB pedestal stands that probably had a bowl attached. The sole example of form VIIIA is a plain surface find at FEA (Specht & Summerhayes, 2007: fig. 15a). This has a lug-like projection on the rim like pot stands in Fiji and Tonga (Birks, 1973: plates 26–30; Poulsen, 1987: fig. 60.2). Related forms occur at FNT (Specht, 1991: fig. 8), and FOH and FOJ (Summerhayes, 2000a: figs 6.8, 7.10) on the south coast of New Britain.

Pedestal stands (VIIIB) at FCR/FCS (Specht, 2007: fig. 5a–c), FEA (Specht & Summerhayes, 2007: figs 6c, 15b–e), FQD (Fig. 8f), and possibly FAS (Fig. 6a) resemble those at FOH and FNY in the Arawes (Summerhayes, 2000a: figs 5.19, 5.31, 5.32, 8.7), ECA on Eloaua (Egloff, 1975: fig. 14a, b; Kirch, 1997: plates 5.1, 5.2), probably in the SE Solomons (Parker, 1981: plate 8 lower) and elsewhere. Two of these stands at FCR/FCS (Specht, 2007), FEA (Specht & Summerhayes, 2007: fig. 10i) and FEM (Fig. 8c) had a bowl directly attached to them (Kirch, 1996: fig. 6; Sand *et al*., 1996: 62, 1999: 20; cf. Egloff, 1979: plate 8a). In other cases the pedestal stands may have supported at times flat-based open bowls that sat on the upper rim of the stand.

Table 4. Vessel forms present in the Talasea area. "●" indicates definitely present, "(●)" indicates probably present, and "○" indicates uncertainty whether the form is II or VII.

	context	I	flat-based bowl I	II	III	IV	V	VI	VII	VIIIA	VIIIB	cylinder stand	bowl on stand
FCH	beach/intertidal	—	●	—	—	—	●	●	(●)	—	—	—	—
FCN/FCO	beach/intertidal	●	—	—	●	—	—	—	—	—	—	—	—
FCR/FCS	beach/intertidal	●	●	○	●	●	●	●	○	—	●	—	(●)
FCT	beach/intertidal	—	—	—	—	—	●	—	—	—	—	—	—
FCV/FCW	beach/intertidal	—	—	—	—	—	—	●	—	—	—	—	—
FCY	beach/intertidal	—	—	—	—	—	—	●	—	—	—	—	—
FDK	beach/intertidal	●	—	—	—	—	—	—	—	—	—	—	—
FEA	beach/intertidal	●	●	●	●	●	●	●	●	●	●	●	(●)
FEM	beach/intertidal	●	(●)	○	●	●	●	(●)	○	—	—	—	(●)
FQD	beach/intertidal	—	—	—	—	—	—	●	(●)	—	●	—	—
FYS	beach/intertidal	●	—	—	—	—	—	—	(●)	—	—	—	—
FAO	coastal hill	●	—	—	—	—	—	●	●	—	—	—	—
FDL/FDM	coastal hill	—	—	—	—	—	(●)	—	—	—	—	—	—
FQY	coastal plain/hill	(●)	—	—	—	—	—	●	—	—	—	—	—
FSZ	coastal hill	●	●	●	—	—	(●)	—	(●)	—	—	—	—
FAAJ	coastal hill	—	—	—	—	—	●	—	—	—	—	—	—
FAAN	coastal plain/hill	—	—	○	—	—		—	○	—	—	—	—
Murikape	coastal hill	●	—	—	—	—	—	—	—	—	—	—	—
FRD	inland hill	—	—	—	—	—	—	—	(●)	—	—	—	—
FRI	inland/upland	●	—	—	—	—	—	—	—	—	—	—	—
FAAK	inland/upland	—	—	—	—	—	—	(●)	—	—	—	—	—
FAAQ	inland/upland	—	—	—	—	—	●	—	●	—	—	—	—
re-deposited													
FAS	beach/intertidal	(●)	—	—	—	—	—	—	—	—	(●)	—	—
FEK	intertidal	—	—	—	—	—	●	—	—	—	—	—	—
FEL	beach/intertidal	—	—	—	—	●	—	—	—	—	(●)	—	—
FRA	streambed	—	—	—	—	—	—	—	●	—	—	—	—
FXO	beach/intertidal	—	—	—	—	—	●	●	—	—	—	—	—

Sherds with applied relief flanges similar to the "cylinder stand" found at ECA (Kirch, 1997: fig. 5.5; cf. Best, 2002: 81–82, fig. 25) are present at FEA (Specht & Summerhayes, 2007: figs 8g, 16c). Sherds with notched or incised applied relief flanges also occur at FAO and FSZ, but these come from other vessel forms (Figs 4f, 12p).

Vessels with sharply angled shoulders forming a horizontal or nearly horizontal ledge above the shoulder angle ("ledged shoulder") occur at FEA (Specht & Summerhayes, 2007: fig. 17i), and possibly FCT (Fig. 6k). An unusual form occurs at FEA (Specht & Summerhayes, 2007: fig. 8e) and FCR/FCS (Specht, 2007: fig. 6k), where an abrupt thinning of the body wall above the shoulder forms a step or rebate. A similar rebate occurs on rims of form I at FCR/FCS (Specht, 2007: fig. 3f) and FSZ (Fig. 11 m).

Miscellaneous pottery items. At FCR/FCS a modelled piece of clay with a flattened oval cross-section and slightly curved profile could be part of an appendage on a vessel or figurine (Specht, 2007: fig. 5n). No other piece like this is known from the Talasea area. Ambrose and Gosden (1991: fig. 6.9) illustrate what might be a small strap handle from FEA.

A plain body sherd with three sides ground flat to form a rectangular shape 46 mm by 39 mm, and 5–6 mm thick was found at FAAQ in pit G12 layer 2 spit 2 (Fig. 15r), just below a date of 2340–2100 cal. BP (Beta-112597) in layer 2 spit 1 (Table 5; Torrence & Stevenson, 2000: table 1). This resembles a sherd ground to a similar shape and size in a post-Lapita context at DAA on Sohano Island (Specht, 1969: 264). Modified sherds ground to discoid form have been recovered at the reef area of DAF, also on Sohano Island, where Wickler (2001: 90) found ten examples in probable "Late Lapita" contexts. Seven round sherds are reported from the FOJ Lapita site in the Arawe Islands, where they are interpreted as lids or stoppers for narrow mouthed vessels (Summerhayes, 2000a: 119, table 7.24). Those at FOJ (assigned to "Middle" and "Late Lapita") are dated c. 2900 to c. 2200 cal. BP (Summerhayes, 2004: table 2), and those from the DAF reef probably date to c. 2750–2250 cal. BP. Both age ranges are consistent with the FAAQ find. Other ground pottery discs have been found in Lapita contexts at RF-2 in the SE Solomons (Parker, 1981: 79), at WKO013 in New Caledonia (Gifford & Shutler, 1956: figs 17e–g), at To–1 on Tongatapu in Tonga (Poulsen, 1987: 206, fig. 55.7) and in chipped form at Sigatoka in Fiji (Birks, 1973: fig. 38). Similar discs also occur in post-Lapita contexts on Buka (Specht, 1969: 264; Wickler, 2001: 194) and the south coast of Papua (Vanderwal, 1973: 136–138). Further afield, Wickler (2001: 194) notes their occurrence in Micronesia, and Bellwood (1997: fig. 7.13) records the presence of decorated examples at Kalumpang on Sulawesi. In many cases, the discs found outside New Britain are perforated or partially drilled and may have had unrelated functions.

Decorative techniques. Tables 1 and 2 list the decorative techniques present in each collection. A closed circle (●) indicates definite presence, a question mark (?) indicates uncertainty with the identification, and a dash (—) signifies absence on present information. Table 5 shows the distribution of techniques according to calibrated radiocarbon dates.

Issues of sample bias resulting from the condition and size of sherds must be borne in mind when interpreting these Tables. Other than at FEA, most sherds from inter-tidal and re-deposited contexts display severe weathering and often do not retain enough of their original surfaces to determine whether they were once decorated. Furthermore, sites with the largest samples (FEA—>8,000, FSZ—>4,550, FAO—676, FCR/FCS—>750, and FAAQ—170) each have at least seven of the eleven techniques listed. In contrast, of the 38 sites with fewer than 100 sherds, 25 (66%) have five or fewer techniques and 13 (34%) have no decoration whatsoever. Of the 36 localities without decoration or with three or fewer techniques, 24 (67%) are in beach/inter-tidal or re-deposited contexts. Where the sample size exceeds ten sherds (22 sites), 20 (91%) have decorated sherds, and 18 of these (90%) have dentate-stamped decoration. The distributions of decorative techniques shown on Tables 1 and 2, therefore, are almost certainly heavily distorted. The FAAK site is a clear example of this. Neither of the two sherds found there is dentate-stamped, but the one incised sherd present has a motif that occurs at other sites with dentate-stamped designs. Thus, it is impossible to say whether the absence of a particular technique at sites with small samples, especially those on beaches and in the inter-tidal zone or re-deposited contexts, reflects sample bias or that the technique was never present.

The "Incised" column includes sherds with plain stamp impressions, as it is often impossible to identify with certainty which technique was used. This category also includes two sherds at FEA (Ambrose & Gosden, 1991: fig. 3.3) and FSZ (Fig. 10a) with plain "rocker stamp" impressions, where the tool was pressed into the surface and then pivoted on one corner and turned slightly to make the next impression in the reverse direction.

Dentate-stamped pottery is present at 23 localities, 16 of which also have incised designs. Eleven localities have fingernail impressions; at nine of these, dentate-stamped sherds are also present. Shell-edge impressions occur with dentate-stamped sherds at FAO, FSZ and FAAQ on Garua, and possibly at FEA (Figs 10o, 11z, 12af, 13ae; Summerhayes, 2000a: fig. 9.2; Specht & Summerhayes, 2007). Punctate (6) and applied relief (7) designs are also rare.

The commonest form of lip modification, single or double notching, occurs at 20 locations. The absence of lip notching elsewhere probably reflects small sample sizes, though in some cases the collections include flat-lipped rims without notching. A notched rim at FEA has short, vertical cut marks just below the notches (Specht & Summerhayes, 2007: fig. 6d), and similar cut marks are present on a rim without lip notching at FAO (Fig. 4t). Seven localities with dentate-stamping and one without have rim sherds with wavy "scalloped" lip modification, where the rim/lip has been pressed sideways rather than notched (cf. Anson, 2000: fig. 6; Green & Anson, 2000: fig. 13). One dentate-stamped sherd at FCR/FCS and an incised body sherd at FEA have a single perforation that might have been used for suspension or for attaching decorative elements such as feathers or leaves (Specht, 2007: fig. 8j; Specht & Summerhayes, 2007: fig. 20c).

Localities with dentate-stamped designs have a total of eleven decorative techniques. Those without have only five, lacking dentate-stamping, circle impressions, excised triangles, cut-outs, applied relief and shell impressions, though sample size and sherd condition may affect these frequencies. Dentate-stamping occurs in combination with linear incision, plain stamps, impressed circles, excised triangles, cut-outs and applied relief, and on notched rims. Linear incision and plain stamping are the next most common techniques. Plain stamps include straight lines, short and long arcs. Circles impressed by a hollow tool and excised triangles usually occur with dentate-stamped designs. Two sizes of circle impressions are recognized: those with a small diameter of about 2–3 mm, and larger ones up to 5–6 mm diameter. The smaller circles occur as part of the body decoration or on flat lips, and usually are components of a dentate-stamped design. Two surface sherds at FAO have rows of large circle impressions (Figs 5k, 5o) reminiscent of the Sohano Incised and Relief sub-style on Buka dated to about 1800–1600 cal. BP (Specht, 1969: plate XI–13k, 13l; Wickler, 2001: table 3.28).

Fingernail impressions do not occur on sherds with decorative techniques other than lip notching. They usually form one or more rows of paired vertical impressions, but occasionally the clay was pinched to raise the area between the impressions. The impressions are positioned on or just above round or carinated shoulders. A variation on fingernail impressions on the shoulder is present at FSZ, where sherd 1102 has vertical scoring on the shoulder angle (Summerhayes, 2000a: fig. 9.3). This kind of shoulder scoring also occurs at the Lasigi sites on New Ireland (Golson, 1991: plate 2) and in the New Georgia region of Solomon Islands (Felgate, 2003: figs 80, 81, 83).

Two surface finds at FAO (Figs 5r–s) have an unusual technique where the clay has been gouged away to form short triangular projections similar to those on sherds at FNT on the south coast of New Britain (Specht, 1991: figs 2b, 4d–e). One sherd from layer 3 spit 2 in TP2 at FQY has two parallel lines of diagonal to horizontal fingernail impressions running like a garland around the vessel body (Fig. 9a); this sherd appears to be unmatched among other pottery collections from New Britain and New Ireland. This level of TP2 is undated; a comparable context in pit A13 at FQY has a date of 2330–2050 cal. BP (Beta-112594) (Table 5).

Sherds with applied relief bands or knobs occur in six collections with dentate-stamped designs. At FEA, three applied relief knobs were modelled as faces with dentate stamping that may represent tattooing (Torrence & White, 2001), as is reported from ERA on Babase Island in the Anir group of New Ireland (Summerhayes, 1998). Several sherds at FAO, FEL and FSZ have small, applied knobs, in one case as a horizontal band around the vessel (Figs 4q–r, 5n, 10*l*). Some relief bands are notched or cut with a sharp, angular tool or a rounded one. On one sherd from FAO the notched relief bands form Y shapes, with paired dentate stamped triangles between the Y forms (Fig. 5v). Other notched relief bands occur at FSZ, where one band that has detached from the vessel wall has a row of paired punctations instead of notching. The band has a semi-circular

Table 5. Distribution of calibrated radiocarbon date ranges (2σ) and decorative techniques in the Talasea area. Pooled means are shown in italics. Samples marked # were marine shell, those marked * were charcoal. All other samples were charred nutshells.

Cal. BP	prob.	lab. code	site	trench/layer/spit	no. sherds	mean wgt	plain	dentate stamp	inc./plain stamp	circle imp.	fingernail imp.	shell imp.	applied relief	notched lip	scalloped lip
1560–1310	1.000	NZA-3730	FSZ	17/96—1 spit 1	16	2.7	15	1	—	—	—	—	—	—	—
1830–1400#	1.000	ANU-5071	FEA	4 top/3 base	n.a.	—	—	—	—	—	—	—	—	—	—
1870–1590	0.978	Beta-112602	FAAQ	G2—4 spit 2	26	3	25	—	—	—	—	—	—	—	1
1875–1560	1.000	NZA-6098	FSZ	13/92—1 spit 1	43	2	42	—	1	—	—	—	—	—	—
1900–1605	0.991	NZA-3732	FSZ	17/98—1 spit 3	46	2.8	40	2	1	—	1	1	—	1	—
1900–1710	0.999	Beta-102970	FAAJ	I—5 spit 1	9	2.8	9	—	—	—	—	—	—	—	—
2070–1820	0.953	Beta-72142	FSZ	I Unit A Dk trans.	4	2.3	4	—	—	—	—	—	—	—	—
2110–1830*	1.000	Beta-34208	FRI	II—3 spit 2	1	3.8	1	—	—	—	—	—	—	—	—
2160–1820	0.961	Beta-112603	FAAQ	G11—3 spit 2	52	2.15	48	1	1	—	—	—	—	2	—
2180–1995	0.832	Beta-102966	FAAK	C4—4 spit 4	1	3.1	1	—	—	—	—	—	—	—	—
2310–2040	0.962	Beta-102969	FAAN	D3—4 spit 2	9	3.6	8	—	—	—	—	—	—	1	—
2310–2100	*0.958*	*pooled mean*	*FAAK*	*C4—4 spit 3 and 4*	*2*	*4.6*	*1*	—	*1*	—	—	—	—	—	—
2320–1970	0.983	Beta-41590	FRI	II—3 spit 3	1	9.9	1	—	—	—	—	—	—	—	—
2330–2050	1.000	Beta-112594	FQY	A13—3 spit 3	1	1.7	1	—	—	—	—	—	—	—	—
2330–2120	1.000	Beta-102965	FAAK	C4—4 spit 3	1	6.1	—	—	1	—	—	—	—	—	—
2340–2100	0.960	Beta-112597	FAAQ	G12—2 spit 1	24	4	21	—	1	—	1	—	—	1	—
2350–2150	1.000	Beta-112593	FAO	E3—5 spit 1	24	3.2	23	1	—	—	—	—	—	—	—
2465–2130	1.000	NZA-2851	FSZ	14/88—1 spit 1	35	3.7	34	—	—	—	—	—	1	—	—
2490–2000*	0.988	Beta-102971	FAAJ	I—5 spit 2	9	4.8	7	—	—	—	1	—	—	1	—
2520–2150	0.894	Beta-112607	FAAN	D7—6 spit 2	37	2.6	36	—	—	—	1	—	—	—	—
2550–2300	0.758	NZA-2852	FSZ	14/88—1 spit 3	2	1.25	2	—	—	—	—	—	—	—	—
2620–2300	0.778	NZA-3731	FSZ	17/96—1 spit 2	75	4.7	60	7	5	1	1	—	—	1	—
2620–2350	0.759	Beta-112598	FAAQ	G5—5 spit 3	3	3.6	2	1	—	—	—	—	—	—	—
2620–2350	0.769	NZA-3738	FAO	1000/1010—3 spit 2	2	2.5	1	—	—	—	—	—	—	1	—
2715–2350	1.000	NZA-3729	FAO	990/990—3 spit 2	6	3.2	5	—	—	—	1	—	—	—	—
2760–2450	0.960	Beta-72140	FAQ	95/210—3 spit 3	0	—	—	—	—	—	—	—	—	—	—
2795–2460	0.990	Beta-72141	FQY	Hill TPI—4 spit 2	1	3	1	—	—	—	—	—	—	—	—
2970–2680	0.909	Beta-112608	FAAN	D7—6 spit 4	10	1.6	10	—	—	—	—	—	—	—	—
3060–2760	1.000	NZA-6099	FSZ	13/92—1 spit 2	77	1.8	74	2	1	—	—	—	—	—	—
3085–2710#	1.000	ANU-5072	FEA	1985—4 mid/top	n.a.	—	—	—	—	—	—	—	—	—	—
3160–2730#	1.000	ANU-5073	FEA	1985—4 top	n.a.	—	—	—	—	—	—	—	—	—	—
3050–2750#	*1.000*	*pooled mean*	*FEA*	*1985—4 mid/top*	*n.a.*	—	—	—	—	—	—	—	—	—	—
3340–3000#	1.000	Beta-41578	FEA	1989—4 spit 2 (base)	784	5	739	21	13	—	—	—	—	9	2
3220–2850	1.000	NZA-3733	FYS	II—5 spit 1	28	3.4	28	—	—	—	—	—	—	—	—
3390–3080	1.000	Beta-72144	FYS	II—5 spit 3	23	3.4	21	1	1	—	—	—	—	—	—
3380–3060	0.964	NZA-3734	FYS	II—5 spit 4	0	—	—	—	—	—	—	—	—	—	—
3370–3140	*0.980*	*pooled mean*	*FYS*	*II—5 spits 3 and 4*	—	—	—	—	—	—	—	—	—	—	—

cross-section, but others are square. Notched relief bands also occur on Tanga (Garling, 2003: fig. 4, sherds ETM–1095, ETM–1218) and at Lossu on New Ireland (White & Downie, 1980: figs 9, 10).

At FCR/FCS and FEA lip modifications include excised triangles and circle impressions, and at FRI two rims have a row of circle impressions (Figs 9*l*–m). The lips of form I rims at FDK (Fig. 6q), FQY (Fig. 8n), FSZ (Figs 10b, 12s), FYS (Fig. 14q) and Murikape (Fig. 15v) have rows of dentate-stamped straight lines. On one rim at FSZ they are combined with dentate-stamped crosses (Summerhayes, 2000a: fig. 9.3). Two red-slipped sherds at FCR/FCS that probably came from the same vessel have a row of small, plain arc stamps on the lip (Specht, 2007: fig. 4f). "Grooved" rims at FEA (Specht & Summerhayes, 2007: figs 11h, 14d), FCR/FCS (Specht, 2007: figs 3m, 3n) and FDK (Fig. 6q) have a flange added at an angle to the lip to form a shallow channel, which was then decorated. One thin rim sherd from FXO has a square-sided channel cut into the flat lip, which is also double notched; below the lip there are dentate-stamping and small plain arc impressions (Fig. 14g).

Motifs/designs. Many designs have similarities with those in Anson's (1983: table XII) motif list, but these are not assigned his motif codes as it is not clear whether they should be treated as variants or as separate motifs, especially where the sherds are very small. Most decorated sherds display wide or narrow bands of repeated geometric design elements, usually separated by bands resembling "rope" impressions (Specht, 1968: 129); this is M35 or M237 of Anson (1983: table XII), restricted zone markers RZ2 and RZ3 of Mead (1975: fig. 2.12), and the "roulette" of Best (2002: 47–48). It is often impossible to determine whether the arcs were made by dentate or plain stamped arcs, and occasionally the impressions are so closely spaced that they appear as rows of straight or curved diagonal lines.

The structure of the design field at many Lapita sites consists of a wide, central band flanked by narrow bands or friezes of repeated elements (Mead, 1975; Sand, 2001; Chiu & Sand, 2005). In the Talasea area, this structure is definitely present at FCR/FCS, FEA, FEK, FEM, FQD and FSZ, but many sherds suggest that some pots were decorated only with narrow bands. Whereas the decoration on flat-based open bowls and pedestal stands often seems to cover the exterior surface (with the exception of the flat base), decoration does not extend far below the shoulder on round-based vessels. Several rims at FSZ (Fig. 13u; Summerhayes, 2000a: fig. 9.3 sherd 118) and FCN/FCO (Specht, 1974: fig. 3) have dentate-stamped designs around the rim interior as well on the exterior.

Chiu and Sand (2005: 141–142) divide the central bands into two main categories: "face" motifs with five variants, and geometric motifs with nine variants (cf. Sand, 2001: 277, figs 5–6). "Face" motifs executed by dentate-stamping (Spriggs, 1990) are rare in the Talasea area, and are recorded with certainty in only two collections. The only definite example at FCR/FCS is a rectilinear Type 2C or 2D "face" (Specht, 2007: fig. 3e). Types 1 and 2 are more common at FEA, where at least 21 examples are recognized, though some are represented only by curvilinear elements similar to those of Spriggs' Type 1 (White *et al*., 2002: fig. 3; Specht & Summerhayes, 2007). Designs similar to "ear plugs" associated with "faces" (Spriggs, 1990: fig. 32) are present at FEA (White et *al*., 2002: fig. 3b; Specht & Summerhayes, 2007: fig. 10j). Complex rectilinear geometric designs, including the "labyrinth" form (Sand, 2001: 277; Chiu & Sand, 2005: 142, fig. 5), at FEA (Specht & Summerhayes, 2007: figs 7e, 11a, 11b, 12a, 12c, 15f, 16d, 19c–h), FCR/FCS (Specht, 2007: figs 8d–e), FQD (Fig. 8g,j) and FSZ (Fig. 10g,h) could be space fillers between "faces" (Spriggs, 1990: 101, 119), or main designs in their own right.

Dentate-stamped triangles with radial infill lines are rare in the Talasea area. At FCR/FCS (Specht, 2007: figs 6e, 9j) and FEA (Specht & Summerhayes, 2007: figs 4s, 9d, 10b, 11g) some have a narrow apex angle with one to four infill lines, and tend to be longer than their base width (Anson, 1983: 58–63; 1990). Other triangles are almost equilateral (Specht, 2007: 4m, 6c, 7j; Specht & Summerhayes, 2007: figs 8g, 12a, 16c). At FRI, a sherd from a ridge exposure just north of the 1989 excavations has short triangles with three infill lines (Fig. 9n; Torrence *et al*., 1990: 462). Anson (1983: 58–59, table III; 1990: table 2) reports elaborated triangles at FCR/FCS, where paired arcs link alternate apices. A surface find at FEA has similarly linked apices, with a circle stamp between them (Specht & Summerhayes, 2007: fig. 12a).

The incised designs can be divided into three groups. Incised group A, with boldly incised (2–3 mm wide) groups of concentric or parallel curvilinear and/or rectilinear lines forming broad bands around the vessel, occurs at FAO (Figs 4p, 5e), FCR/FCS (Specht, 2007), FCV/FCW (Figs 6m, 6n), FEA (Specht & Summerhayes, 2007: figs 5–8, 10, 13, 20, 21; White *et al*., 2002: fig. 4); FEM (Figs 7f, 7j–7l, 8b), FQD (Figs 8i, 8k), FSZ (Fig. 12n) and FYS (Fig. 14h, 14n). These resemble incised sherds reported from several Lapita sites: the Arawe Islands (Summerhayes, 2000a: figs 5.24, 6.3, 7.7); FNT, near Kandrian (Specht, 1991: figs 2–3); Duke of York Islands (White, 2007); ECA in the Mussau group (Kirch, 1988: fig. 5); Lamau on New Ireland (Gorecki *et al*., 1991: fig. 2); EAQ in the Anir group (White & Specht, 1971: plate IIg); DAF on Sohano Island (Wickler, 2001: fig. 5.2); the New Georgia group (Felgate, 2001: figs 3,4; 2003: figs 66–67); the Santa Cruz-Reef Islands (Donovan, 1973: fig. 3); New Caledonia (e.g., Sand *et al*., 1996: 134–135; 1999: 47); Fiji (Best, 2002: figs 18–19); and Tonga (Poulsen, 1987: plate 46).

Incised group B, with finer rectilinear lines, is only tentatively identified. Some of the designs could be the same as those of Incised A but differing only in the width of the incisions, while others seem to form bands of simple repeated elements. These are present at FCR/FCS, FEA (Specht & Summerhayes, 2007: fig. 13c), FEM (Fig. 7i) and FSZ (Figs 12c, 13n). Incised group B is reminiscent of Type Y at KLK on Tuam in the Siassi Islands (Lilley, 2002: fig. 5). Lilley (2002: 86), citing a personal communication from Summerhayes, compared his Type Y with some FAO sherds that resemble the "hard and grey" description of Type Y, though the FCR/FCS and FEA sherds do not match this description. The information available about Type Y, however, is insufficient to confirm its presence in the Talasea area. Several other sherds in the Incised B group resemble those of the New Georgia region in Solomon Islands (Felgate, 2003: figs 7–9), including one incised and punctate sherd found at FEA (Felgate, 2001: figs 3–4; 2003: figs 12–13). Lilley and Felgate assign such sherds to the "Late" or "Post" Lapita period.

Incised group C might be better termed gouged or carved, rather than incised, as the technique produces broad lines 3–4 mm wide with a rounded cross-section. The technique is rare, and is currently only recorded at FEA with dentate-stamped designs (Specht & Summerhayes, 2007: figs 11c, 11d, 15c, 20l), and by itself at FEL (Plate 13), FEM (Fig. 7i) and FQY (Fig. 9h). It also occurs at ECA on Eloaua (Kirch, 1988: fig. 4; 1997: plate 5.1), FOH in the Arawe Islands (Summerhayes, 2000a: figs 5.19, 5.31), and at RF-2 in the SE Solomons, where Donovan (1973: 17, 56, fig. 3) describes the technique as "incut."

Excised triangles occur only in the FCR/FCS and FEA collections (Specht, 2007: fig. 3e; Specht & Summerhayes, 2007: figs 4a, 4b, 11c, 11f, 11h). Carved surfaces comparable with those at FOH in the Arawes (Summerhayes, 2001a: figs 5.29, 5.31, 5.32), ECA on Eloaua (Kirch, 1997: plate 5.1), in the Duke of York Islands (White, 2007: figs 6, 10, 14), and at EAQ on Ambitle (White & Specht, 1971: fig. 3) are not present in the Talasea area collections. This technique may be restricted to pedestal stands, of which there are few examples in the Talasea area.

"Cut-out" decoration occurs on a pedestal stand fragment at FEA (Specht & Summerhayes, 2007: fig. 16e). Summerhayes (2000a: table 9.7) lists a possible cut-out sherd from square 14/93 spit 3 at FSZ, but this is more likely to be a flat-lipped rim fragment. The technique is present on pedestal stands in the early levels at FOH and FNY in the Arawe Islands (Summerhayes, 2000a: figs 5.33, 6.8, 8.7, 8.8); in the Mussau group in zone C3 of Area B and the lower levels of the W250 Transect at ECA (Kirch, 1997: plate 5.2; 2001a: figs 4.30, 4.39); the EAQ and ERA sites in the Anir group (Australian Museum collection, Sydney, and Summerhayes, pers. comm.); New Caledonia (Sand, 2000: 23); Fiji (Best, 2002: fig. 23, IIc–e); and Tonga (Poulsen, 1987: plate 43.6). The technique also occurs in Sohano Style contexts on Buka, dated around 1800–1600 cal. BP (Specht, 1969: plates XI–11u–w, XI–14b; Wickler, 2001: table 3.28), and possibly in the following Hangan Style (Wickler, 2001: tables 6.23, 6.24). On Buka, however, the cut-outs are more crudely executed and occur on round-based vessels, and not pedestal stands.

Table 6. Student's *t*-test (two tailed) comparisons of minimum and maximum sherd thickness (mm) between FCR/FCS and FEA.

	n	mean	SD	df	*t*	p
minimum thickness						
FEA excavated	513	7.39	2.1			
FCR/FCS	275	6.28	1.8	786	7.42	<0.001
FEA surface	185	8.16	2.5			
FCR/FCS	275	6.28	1.8	458	9.44	<0.001
FEA all	698	7.59	2.2			
FCR/FCS	275	6.28	1.8	971	8.69	<0.001
maximum thickness						
FEA excavated	640	8.43	2.4			
FCR/FCS	268	7.29	2	906	6.89	<0.001
FEA surface	185	9.66	2.8			
FCR/FCS	268	7.29	2	451	10.7	<0.001
FEA all	825	8.7	2.5			
FCR/FCS	268	7.29	2	1091	8.38	<0.001

Table 7. Student's *t* test (two tailed) comparisons of maximum shoulder thickness (mm) between FCR/FCS and FEA.

	n	mean	SD	df	*t*	p
shoulder thickness						
FEA excavated	54	10.44	2.54			
FCR/FCS	47	9.34	2.58	99	-2.16	0.0329
FEA surface	24	13.01	4.44			
FCR/FCS	47	9.34	2.58	69	-4.41	<0.0001
FEA all	78	11.23	3.43			
FCR/FCS	47	9.34	2.58	123	3.27	0.0014

Sherd thickness. While handling the sherds from FEA and FCR/FCS, it became obvious that there were differences in sherd thickness between the sites, and between the excavated sherds of FEA and the surface collection from FCR/FCS, and the surface finds from FEA. Maximum and minimum sherd thicknesses were recorded for these sites (excluding heavily weathered sherds), and the means were compared by the Student's t test (two-tail). The main results are presented elsewhere (Specht & Summerhayes, 2007; Specht, 2007), and here we provide only a summary (Tables 6 and 7). At FEA, sherds in the surface collections (mostly from the intertidal zone and lagoon floor) are thicker than those excavated. This applies to incised and dentate-stamped sherds, and to the maximum thickness of shoulders. The FCR/FCS sherds are closer in thickness to the FEA excavated sherds than to the FEA surface collections, particularly the incised, dentate-stamped and shoulder surface sherds at FEA, which are significantly thicker than comparable sherds at FCR/FCS. These differences are consistent with those noted between the two sites in terms of vessel forms, decorative techniques and some motifs (Specht, 2007).

Dating the Talasea pottery sequence

Table 5 lists in sequence 35 dates for pottery sites in the Talasea area (Specht & Gosden, 1997; Torrence & Stevenson, 2000: table 1; White *et al*., 2002: table 2), and three pooled means for pairs of dates from FAAK (Beta-102965 and Beta-102966), FEA (ANU-5072 and ANU-5073) and FYS (Beta-72144 and NZA-3734). The pooled means are shown in italics. The Table includes one date for a level without pottery at FAQ (Beta-72140). Two samples (Beta-34208 and Beta-102971) were on charcoal (marked *), and four (ANU-5071, ANU-5072, ANU-5073, Beta-41578) on marine shell (marked #). The other 29 samples were charred nutshell fragments.

Spriggs (2001: 240–241) has questioned the late dates previously proposed for pottery in the Talasea area on grounds of sediment disturbance and consequent mixing of pottery of different periods (Specht *et al*., 1991: 287; Torrence & Stevenson, 2000; cf. White *et al*., 2002: 106). There are undoubted difficulties with interpreting the relationship between 14C dates and many pottery contexts, particularly for the end of the main part of the Talasea sequence (i.e., excluding the late trade wares of recent times). Table 5 shows the sporadic occurrence of dentate-stamped sherds in unacceptably late contexts, and accordingly we

reject NZA-3730 (1560–1310 cal. BP) at FSZ and ANU-5071 (1830–1400 cal. BP) at FEA (Specht & Summerhayes, 2007). The latter date is inconsistent with ANU 5072 (3085–2710 cal. BP) from the same depth (Ambrose & Gosden, 1991: table 1). The submission sheets for these samples show that they came from excavation units that cut across the sloping interface of layers 3 and 4, and the samples could have come from different layers (Specht & Summerhayes, 2007). Other questionable samples are discussed below.

Start of the pottery sequence. A base line for the start of the Talasea pottery sequence is provided by the W-K2 tephra (Plate 10). This tephra is dated to about 3600 cal. BP (Torrence *et al*., 2000: table 1; cf. Machida *et al*., 1996), or slightly later at about 3540–3240 cal. BP using a Bayesian approach (Petrie & Torrence, in prep.). Pottery never occurs below this tephra (Specht *et al*., 1991: 287), which is present at FRI and on Garua Island (FAO, FAQ, FQY, FRD, FSZ, FYS, FAAI, FAAJ, FAAK, FAAN, FAAP and FAAQ), though it does not survive as a definable unit at FEA (Specht & Summerhayes, 2007).

The oldest direct dates for the pottery sequence come from FYS and FEA. Three nutshell samples from layer 5 of Pit II at FYS have ranges of 3220–2850 cal. BP (spit 1, NZA-3733), 3390–3080 cal. BP (spit 3, Beta-72144), and 3380–3060 cal. BP (spit 4, NZA-3734). Torrence and Stevenson (2000: 335) commented that an incised body sherd (spit 3) and notched rim (spit 2) in this layer seem stylistically to belong to a later period. Re-examination of the pottery from Pit II, however, revealed a weathered dentate-stamped rim of a form I open bowl in spit 3, and a heavily rolled rim with dentate-stamped lines on the lip from the beach fronting FYS (Figs 14o, 14q). The dates for spits 3 and 4 give a pooled mean of 3370–3140 cal. BP. Although there were no sherds in spit 4, we accept this pooled mean as the starting date for pottery at this site. At FEA, the lowest shell sample (Beta-41578) from the base of layer 4 has a range of 3340–3000 cal. BP. This was associated with dentate-stamped sherds and form I open bowls, and is statistically the same as the dates for layer 5 spits 3 and 4 at FYS. These results suggest that dentate-stamped Lapita pottery began in the Talasea area at about 3370–3140 and 3340–3000 cal. BP.

This range is broadly supported by comparisons with sites elsewhere in the Bismarck Archipelago. Anson (1983, 1986) grouped FCR/FCS with the Area A palaeobeach terrace at ECA in the Mussau group and the EAQ site in the Anir group of New Ireland in his "Far Western Lapita" group. Kirch (2001b: 205) dates the earliest occupation at Area A to 3530–3260 cal. BP at 1σ, and suggests that its use might have started 100–150 years before that on the Area B reef flat. The pottery on the palaeobeach terrace consists "almost exclusively of red-slipped plainwares," and includes only two decorated sherds, both with dentate-stamping (Kirch, 2001a: 85; 2001b: 206). Kirch (2001b: 214) notes a minor inconsistency between the scarcity of decorated sherds at ECA/A and their prevalence at ECB, which is the same age (3470–3250 cal. BP at 1σ) as ECA/A. These dates overlap substantially with the ranges for FYS and FEA.

The age of EAQ in the Anir group of New Ireland is problematic, as two charcoal dates (ANU-11190, ANU-11193) have ranges spanning 800 and 1200 years (Summerhayes, 2001b: 34, table 3). At the ERA site, two shell dates of 3210–2950 (Wk-7560) and 3330–3070 cal. BP (Wk-7562), and two charcoal dates of 3360–3080 (Wk-7561) and 3380–3080 cal. BP (Wk-7563) fall squarely within the FYS and FEA ranges, and overlap substantially Kirch's preferred ranges for ECA and ECB.

A re-evaluation of the FCR/FCS pottery (Specht, 2007) suggests that it is similar to that from the earliest levels at FOH and FOJ in the Arawe Islands, where the ranges of two charcoal (ANU-11186: 3240–2750 cal. BP, and ANU-11187: 3140–2720 cal. BP) and three shell dates (Beta-55323: 3240–2850 cal. BP, Beta-29245: 3200–2890 cal. BP, and Beta-27946: 3210–2810 cal. BP) overlap with the lower limits of the FYS and FEA ranges, and fall just below the ECA/A and ECB ranges (Summerhayes, 2001b: table 3).

FEA has two other shell dates for the middle and top of layer 4 (ANU-5072, ANU-5073), which give a pooled mean of 3050–2750 cal. BP (Table 5). This is slightly younger than the lowest sample for FEA and the FYS pooled mean, but essentially the same as those for FOH and FOJ.

The FEA surface collections, primarily drawn from intertidal zone and lagoon floor, contrast in several respects with the excavated material from FEA and from the FCR/FCS surface finds, not least in terms of modelled "tattooed" heads, cut-outs on a pedestal stand, the presence of ledged shoulders and other aspects of form and decoration, as well as sherd thickness. With the exception of the modelled heads, the FEA surface collections are similar to those associated with the stilt structure of zone C of ECA Area B, which contained a cylinder stand and sherds with cut-out elements (Kirch, 2001a: 103, fig. 4.30). The stilt structure is dated to about 3250–3150 cal. BP (Kirch, 2001b: 208). This is slightly older than the pooled mean for the middle-top of layer 4 at FEA, although as deposition in zone C of ECA/B continued for several hundred years it does not necessarily conflict with the FEA range.

Summerhayes (2004: table 2) places the pottery of FSZ in two periods: "Late Lapita" at 2700–2600 to c. 2200 cal. BP, and "Post Lapita Transition" at c. 2200–1600 cal. BP. Earlier use of the site, however, is indicated by the date of 3060–2760 cal. BP (NZA-6099), which was associated with two dentate-stamped body sherds (Table 5). This range is contemporary with the middle-top of layer 4 at FEA and, on the ECA/B evidence, possibly with the deposition of pottery in Boduna's lagoon. Finally, five dates for dentate-stamped Lapita pottery in the Duke of York Islands (White & Harris, 1997: 100), with which the FEA surface sherds have much in common, are generally consistent with the FEA dates (White, 2007; Specht & Summerhayes, 2007).

End of the pottery sequence. Dating the later stages of the main part of the Talasea pottery sequence is problematic, but it ended no later than the emplacement of the W-K3 tephra at about 1810–1620 cal. BP (Plate 11; Petrie & Torrence, in prep.). This tephra provides a *terminus ante quem*, as pottery never occurs above it at locations on the southern part of the Peninsula where the tephra occurs as an undisturbed deposit (Torrence *et al*., 2002). This tephra, however, cannot be used consistently as a reliable stratigraphic marker for the end of pottery in the Garua Harbour area because it survives on Boduna and at some Garua sites only in reworked form, and at other Garua sites it is very thin. We discard four results that overlap completely the date range of the W-K3 tephra: ANU-5071 (FEA), Beta-112602 (FAAQ), NZA-6098 (FSZ) and NZA-3732 (FSZ), but tentatively accept Beta-102970 (FAAJ).

At FSZ, where the W-K3 tephra is absent, sherds associated with young dates occurred below the Dk tephra, which is several hundred years later than W-K3 (Petrie & Torrence, in prep.). The small size (Table 5) and weathered condition of many sherds at FSZ suggest post-depositional disturbance perhaps through cleaning of the area (Torrence & Stevenson, 2000: 328) or later gardening activities (cf. Green & Anson, 2000: 46 for SAC on Watom). Site use could have continued after the end of pottery but before W-K3, resulting in sherds becoming mixed with younger dating materials, which indicate that people were present but not necessarily with pottery. This problem may not apply to samples such as NZA-2852, NZA-3731 and NZA-6099 that came from contexts 10–30 cm below the Dk tephra. We provisionally accept these three results as providing a general guide to the age of their associated pottery.

The two FRI dates of 2320–1970 (Beta-41590) and 2110–1830 (Beta-34208) cal. BP (Table 5) each relates to a single plain sherd. As other sherds occurred below the dating samples, which were from contexts where an earth oven had been dug into the soil formed on the W-K2 tephra, the two dated sherds could be re-deposited, as are two plain sherds found in the mixed W-K3 and W-K4 tephras that seal the oven. We see no reason, however, to reject eight other dates (and the FAAK pooled mean) that fall in the interval 2350–1820 cal. BP, only two of which (Beta-112603 at FAAQ, and Beta-112593 at FAO) were associated with dentate-stamped decoration. At this stage, a best estimate for the end of the main Talasea pottery sequence is somewhere within this 530-year period, but the current evidence does not permit greater precision.

Comparisons with pottery found elsewhere in the Bismarck Archipelago, unfortunately, do not provide any better guide. Notched relief sherds at FAO are undated, but on Tanga similar notched relief occurs in ETM 3/II/7 just below a date of 1990–1530 cal. BP (ANU-11608) and in ETM 3/II–III/8 at 2710–2000 cal. BP (ANU-11609) (Garling, 2003: fig. 4, table 6). Where within this range the FAO sherds might fall is unknown. The similarity between the shaped sherd found at FAAQ below a date of 2340–2100 cal. BP (Beta-112597) and shaped sherds on Buka also does not help, as the Buka examples occur in contexts with a wide range of dates. Comparisons between the circle-stamped surface sherds at FAO and circle-stamped sherds of the Sohano Style of Buka are likewise not helpful, as the Buka sherds are dated to about 1800–1600 cal. BP, contemporary with the W-K3 volcanic event. The Garua sherds that resemble Type Y are also not dated. The sample of Type Y currently available for comparison is extremely limited and insecurely dated, and could date to around 2300 cal. BP or 1700 cal. BP, or even later (Lilley, 2000: 182; 2002: 88).

In summary, the start of the main part of the Talasea pottery sequence is constrained by the date of the W-K2 tephra at about 3540–3240 cal. BP, which overlaps with Kirch's preferred dates for ECA/A and ECB (3450–3250 cal. BP). While the presence of Willaumez Peninsula obsidian in the earliest levels of the Mussau sites might indicate Lapita activity, if not actual settlement, in the Talasea area at that time, the obsidian could have reached Mussau through mechanisms other than direct interaction. The slightly later dates of about 3370–3140 and 3340–3000 cal. BP for FYS and FEA are more likely for the Talasea area, as we need to allow for a period without people over a wide area of this part of New Britain following the devastating effects of the W-K2 eruption (Torrence *et al*., 2000: 240). Setting a firm end-date for this part of the Talasea pottery sequence is problematic, particularly as we do not know whether it was an event or part of an extended process. Pottery probably ended during the period 2350–1820 cal. BP, before the W-K3 event at 1810–1620 cal. BP.

Stylistic change

Discussion of stylistic change through time is hampered by the small size of most samples and by dating issues, and only some broad trends can be suggested. Table 8 lists 25 attributes of vessel forms, decorative techniques and motifs in three surface and six excavated collections, the latter arranged in order of their oldest 14C dates. FAO, FSZ, FQY and FAAQ are each treated as single assemblages, and FEA is divided into surface and excavated (1989) collections. As previously noted, the number of attributes present in any assemblage is affected by sample size, with the smallest assemblages having fewest attributes. Site age, however, almost certainly plays a role as well, as FAO and the FEA surface collection are similar in size, but FAO has only two-thirds of the attributes present in the FEA surface collection.

There are vestiges of a sequence in the excavated pottery at FEA, with shifts from mainly dentate-stamped to more incised decoration, a decrease in the number of carinated shoulders but an increase in rounded ones accompanied by less decoration, and an increase in plain rims (Specht & Summerhayes, 2007). It is unclear whether the differences between the excavated pottery and that from the inter-tidal zone and lagoon floor at FEA is temporal or is related to the nature of the activities carried out in each area.

The most marked contrast between the sites is the number of vessel forms present, with the three youngest sites (FQY, FAO and FAAQ) having only four forms between them, compared with seven to ten at each of the oldest sites (FCR/FCS, FEA, FEM). The "intermediate" site of FSZ has five forms, possibly six. That these frequencies are not the result of sample size is shown by the presence at FEM of seven (and possibly nine) forms, whereas there are only three in the much larger sample at FAO. The forms that occur in FQY, FAO and FAAQ are the simple round-based Forms V, VI and VII with everted, vertical or inverted rims; many of these appear to have only lip notching as decoration. The vessel forms that did not persist are the various kinds of stands and Forms II and IV; Form I bowls are absent from the youngest site, FAAQ.

The timing of the appearance of specific motifs is made difficult by the small size of many sherds, though dates for several decorative techniques can be tentatively proposed. "Face" motifs, modelled heads, excised triangles and cut-outs occur only at FCR/FCS and FEA. The absence of these decorative elements in the large collection from FSZ suggests that they might have been dropped from the design inventory by about 3000 cal. BP or soon thereafter. There is only one fingernail impressed sherd at FCR/FCS and none at FEA, implying that the development of this technique was after the main dentate-stamped phase. Its earliest occurrence on Garua is at 2715–2350 cal. BP (NZA-3729), which places it towards or at the end of the use of dentate-stamped decoration as defined by Spriggs (2003: 205). An overlap in time between dentate-stamping and fingernail impressions is indicated,

however, by their co-occurrence on a sherd at the Kreslo site (FNT) on the south coast of New Britain (Specht, 1991: fig. 7c). Unfortunately, Kreslo is an inter-tidal site that cannot be dated.

Although one sherd at FEA could be shell impressed, the earliest definite evidence for this technique occurs at FSZ at 20 cm below a date of 2620–2300 cal. BP (NZA-3731). Punctate decoration is rare throughout the Talasea area, with only three examples at FEA, two at FSZ and one at FAO. None of these is from a dated context.

In brief, there was a shift through time from a wide range of vessel forms to a smaller range of simpler forms, the loss of some decorative techniques and the introduction of others. Qualitatively, the shift in decorative techniques was accompanied by a reduction in the complexity of motifs and extent of the vessel surface that was decorated. Plain vessels with only lip notching appear to have been common. Dating these changes is difficult. The contrast between FSZ and FCR/FCS, FEA and FEM suggests that some changes occurred around or soon after 3000 cal. BP, while others occurred after about 2800–2700 cal. BP.

Discussion

The pottery collections from the Talasea area fall into two groups: 23 with dentate-stamped designs that are clearly part of the Lapita ceramic series (five re-deposited), and 24 without (nine re-deposited). Of those without dentate-stamped designs, two are of recent origin and another nine are re-deposited. Some the remaining 13 sites without dentate-stamped designs, but certainly not all, may represent late stages of the Lapita ceramic series in this area, though there is a serious issue of sample bias. Most of these collections have few sherds, and lack datable contexts or distinctive stylistic attributes that permit relative dating. Collections from beach level or the inter-tidal zone present significant problems for future study, as about one third appear to be re-deposited, quarrying has destroyed two localities, and wave action and fluctuations in relative sea level have probably removed much of the evidence elsewhere (White *et al*., 2002: 106; cf. Felgate, 2003). The most promising locations are those where the pottery levels are sealed by tephras, particularly on hill and ridge tops, though currently none of these locations have dates as early as those of FYS or FEA.

The main part of the Talasea pottery sequence lasted from 3370–3140 and 3340–3000 cal. BP to about 2350–1850 cal. BP. People using and/or making dentate-stamped pottery appear to have been the first to re-colonize the Talasea area following the devastation caused by the W-K2 eruption. The sequence probably began with FYS, FEA and FCR/FCS, followed by FSZ. The pedestal stand fragment at FQD on Langu Island, a flat-based bowl and possible bowl-on-stand at FEM on Garala, and an ornately decorated grooved rim at FDK below Bitokara link these collections with FEA, and they may be of a similar age. Among these, FEA stands out in terms of the quantity of sherds, cylinder stands, the heavy "ledged" shoulders, the modelled "tattooed" heads, the diversity of decorated sherds, including various "face" motifs and cut-outs, and thickness of the surface sherds. None of the other locations, even those that are reasonably well sampled, have all of these attributes (Table 8).

The earliest sites are situated at beach level, with three on small islands (FEA, FEM, FQD) one on Garua (FYS) and two on the mainland (FCR/FCS, FDK), where pottery occurs in the inter-tidal zone and on slightly elevated palaeobeaches (Plates 10, 11). This matches the Mussau Islands, where sites ECA, ECB and EHB are also located on palaeobeaches (Kirch, 2001a). Relative sea level at the Mussau sites was about 1 m higher at the time of initial occupation (Kirch, 2001a: 132, fig. 4.45), and this was probably also the situation around Garua Harbour. The initial occupation at FEA was probably on land, with deposition on the lagoon floor at the same time or slightly later, perhaps in association with stilt structures over the sea. While the current condition of FCR/FCS prevents exploration of the possibility that part of it might have been located over the inter-tidal flat, this cannot be discounted, and the same might have been true for FEM and FQD, and part of FYS. These sites thus broadly parallel the settlement pattern described for the Mussau and Arawe Islands. Unlike those areas, however, the subsequent history of Garua Harbour did not result in closed deposits with well-preserved cultural remains. The estimation of most site areas is problematic, though some fall between 3,000 m^2 and 12,000 m^2.

Kirch (2001a: 103) observes that zone C at ECA Area B yielded a "concentration of special objects and ceramics—unparalleled elsewhere in the ECA Site, or indeed at any other Lapita site excavated to date," and suggests that the stilt building in zone C of Area B "was a special-function structure." The FEA surface finds stand out in the Talasea area and may signify that FEA was also a "special-function" area. The FEA, FEM, FQD finds are from very small islands that were probably unsuitable for permanent habitation without access to garden land on the mainland or larger islands, or importation of food and other resources. We suggest that these small islands might not have been used permanently for domestic purposes. They could have been visited on an irregular basis, perhaps as central places for dispersed groups that assembled for periodic ritual or ceremonial activities requiring comparative isolation or direct association with the sea.

Torrence and Stevenson (2000: 336) have proposed a shift in settlement focus, perhaps for defensive purposes, from beaches and islands to hilltops and ridges around 2800–2400 cal. BP. This did not necessarily mean that beach level locations were no longer used, as activities such as accessing garden land, fishing trips, obsidian procurement, trading and so forth presumably continued there, though it is impossible to date most of the inter-tidal and beach level pottery scatters. An alternative possibility to the proposed settlement pattern shift can be entertained, however, as the earliest date for FSZ (3060–2760 cal. BP) suggests comparatively early use of the hilltop. The finds at FRI lend support to this view. The FRI site is about 1 km inland from the present-day beach and extends over several ridges up to 95 m above the coastal plain (Plate 8). When pottery was introduced to FRI, the beach was closer to the base of the ridges, as much of the coastal plain was formed over the last 2000 years as a result of tephra falls and slope wash deposits blanketing the fringing reef, and perhaps by a change in relative sea level. Some FRI surface sherds have finely dentate-stamped designs that were carefully executed and imply a much earlier use of the ridges than the two dates (Beta-34208, Beta-41590) indicate. The decorated sherds

Table 8. Distribution of 25 attributes of form and decoration at eight pottery sites in the Talasea area. The date ranges cited for the excavated sites are the oldest for each site. "●" indicates definitely present, "(●)" indicates possible presence.

location	FCR/FCS beach/ inter-tidal	FEM beach/ inter-tidal	FEA beach	FEA lagoon/ inter-tidal	FYS beach/ inter-tidal	FSZ coastal hill	FQY coastal hill/plain	FAO coastal hill	FAAQ inland hill/ upland
context	surface	surface	excavation	surface	excavation	excavation	excavation	excavation	excavation
number of sherds	c. 750	>50	>8,000	>600	75	>4550	106	676	170
oldest date	*n.a.*	*n.a.*	3340–3000	*n.a.*	3370–3140	3060–2760	2795–2460	2715–2350	2620–2350
Form I bowl	●	●	●	●	●	●	●	●	—
Form I flat-based bowl	●	●	●	●	—	●	—	—	—
Form II	(●)	(●)	●	—	—	●	—	—	—
Form III	●	●	●	●	—	—	—	—	—
Form IV	●	●	●	●	—	—	—	—	—
Form V	●	●	●	●	—	(●)	—	—	●
Form VI	●	●	●	●	—	—	●	●	—
Form VII	(●)	(●)	●	(●)	(●)	●	—	●	●
Form VIIIA stand	—	—	—	●	—	—	—	—	—
Form VIIIB stand	●	—	●	●	—	●	—	—	—
bowl-on-stand	●	●	—	●	—	—	—	—	—
cylinder stand	—	—	●	●	—	—	—	—	—
notched lip	●	●	●	●	●	●	●	●	●
scalloped lip	●	—	●	●	—	●	—	●	●
dentate-stamped	●	●	●	●	●	●	●	●	●
incised/plain stamped	●	●	●	●	●	●	●	●	●
circle impressed	●	—	●	●	—	●	●	●	—
excised triangles	●	—	●	●	—	—	—	—	—
cut-outs	—	—	—	●	—	—	—	—	—
fingernail impressed	●	—	—	—	—	●	●	●	●
shell impressed	—	—	—	—	—	●	—	●	(●)
punctate	—	—	—	●	—	●	—	●	—
applied relief	—	—	●	●	—	●	—	●	(●)
modelled heads	—	—	—	●	—	—	—	—	—
face motifs	●	—	●	●	—	—	—	—	—
N = 25	16(18)	10(12)	18	21(22)	4(5)	14(15)	7	12	7(9)

do not include fingernail impressions, short slash incision, shell edge impressions or applied notched relief similar to the late Garua pottery. Together, FSZ and FRI may represent evidence for early use of non-beach locations.

All the pottery localities other than FQW had access to the sea and coral reefs; even those situated on coastal or inland hills and ridges are only a short distance away. Some had freshwater sources close by and, with the exception of the smallest islands, arable land was widely available on coastal plains, ridges and hilltops and their slopes. A feature common to all but two localities at sea level is that they were protected from the impact of severe weather conditions, particularly during the northwest wet season (October-March). This applies to locations within Garua Harbour (e.g., FCH, FCN/FCO), and to those fronted by islands that would have afforded some protection from the weather (e.g., FCT, FRJ). Furthermore, those on islands are generally situated on the southern, protected side. The exceptions are FEM on Garala Island and FEA on Boduna, which would have been exposed to the force of the wet season weather from the north and northwest. The seasonal weather patterns and lack of protected locations may also explain the apparent scarcity of pottery finds between Voganakai and Volupai on the west coast of Willaumez Peninsula.

Although a few sherds at FEA and FSZ are probably from pots made on the south coast of New Britain (Summerhayes, 2000a: 218), most of the pottery appears to be of local origin. The number of production centres is uncertain, but the presence of obsidian in sherds at some sites and its apparent absence at others might indicate a minimum of two production areas or communities, and that the one of these continued for some time. The distribution of pottery over a large part of the Talasea area indicates considerable movement of pots and people, though we do not know whether this was between communities of the same or different ethno-linguistic groups (cf. Terrell, 1989; Lilley 1999, 2000; Pawley, 2003: 26).

Pottery production in the Talasea area probably ended about 2350–1850 years ago, before the W-K3 eruption. Why production ceased is not clear. Lilley (2004: 93–94) has invoked the impact of the W-K3 event, but this tephra is not well expressed to the north of Walindi and its impact on the Garua Harbour area would have been far less devastating than that of the W-K2 and Dk eruptions.

Following the W-K3 event there was a long gap of possibly 1000 years before pottery was again used in the area. Type X, Ancestral Sio and Ancestral Madang (Lilley, 1986, 1988a,b, 2007) are not represented among the thousands of sherds examined from the Talasea sites. This is surprising, as Type X (now dated about 1000–500 cal. BP—Lilley & Specht, 2007) and Ancestral Sio pottery have been found in the Kove Islands to the west of Willaumez Peninsula (Lilley, 1991). The unusual incised and punctate rim sherd at FEA (Specht & Summerhayes, 2007: fig. 13b) is undated but might be of similar age to Type X. If so, this raises further issues about the absence of Type X in the Talasea area. When pottery was definitely used there once more, it was only within the last few hundred years and the pots were not produced locally, but were imported in small numbers from mainland New Guinea centres.

The Talasea area is of major significance in the study of the Lapita ceramic series. Allowing for the 14 re-deposited sites, there is an exceptionally high density of pottery locations on the mainland and islands of Garua Harbour, 16 of which have dentate-stamped sherds. Further research in the area is clearly required, especially to resolve issues such as better control over chronology and stylistic change within the ceramic series, inter-site variability in terms of artefact content and location, and site function. The dynamic nature of the landscape during the late Holocene will not make these easy tasks to achieve, but the importance of the area in the history of the western Pacific ensures that the effort will be justified.

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Appendix 1

Catalogue of pottery find-spots in the Talasea area

The radiocarbon ages cited here are calibrated by the CALIB 5.0.1 program. They differ slightly from those given in the publications cited, which were calibrated with earlier versions of CALIB. The Intcal04.14c curve was used for terrestrial samples, with 1-year and 10-year moving averages for the growth span of nutshells and wood samples respectively. The Marine04.14c curve was used for samples of marine origin ($\Delta R = 0 \pm 0$ years), without allowance for the growth span of the organism. Calibrated ranges are at 2σ and, except where a result ends with 5, are rounded to the nearest 10-year interval.

FAO

Garua Island. Situated on NE Garua, this location incorporates a hilltop and its slopes as well as a ridge running westerly down to the main exposure of Baki obsidian (Plate 6; Torrence *et al*., 1992: table 1, localities 38–41). Part of the eastern side of the hill has suffered a landslide that transported sediments and artefacts down to beach level to form "site" FEL. Anderson *et al*. (2001: table 1) estimate the area of FAO as 1600 m^2 but this is much less than its original size. The extent of the artefactual scatters is hard to determine, as sherds and obsidian have been dispersed widely as a result of human activities and slope wash from the hilltop and associated ridges.

Excavations in 1989, 1992, 1993 and 1997 yielded pottery with dentate-stamped, incised, fingernail impressed, circle impressed, shell impressed, punctate and applied relief decoration, and scalloped and notched rims, as well as obsidian artefacts. In layer 3 spit 3 of pits 989/1010 and 990/970 were found several very thin (c. 3 mm), hard plain sherds with grey or red-brown surfaces; one of these is a flat-lipped rim. These contrast markedly with other sherds from FAO.

Three nutshell samples gave dates of 2620–2350 cal. BP (NZA-3738, square 1000/1010, layer 3 spit 2), 2715–2350 cal. BP (NZA-3739, square 990/990, layer 3 spit 2) and 2350–2150 cal. BP (Beta-112593, square E3, layer 5 spit 1). These are supported by obsidian hydration dates (Torrence & Stevenson, 2000: tables 1, 3). Additional refs: Specht *et al*., 1988, 1989; Torrence *et al*., 1990: 462; Torrence, 1992a, 1992b, 2002; Torrence & Webb, 1992: 6–7; Barton *et al*., 1998; Kealhofer *et al*., 1999; Therin *et al*., 1999; Parr *et al*., 2001a, 2001b.

FAP

Malaiol stream, Garua Island. The single plain sherd found in this deep streambed is re-deposited, but its source is not known. In 1989, a dense deposit of debitage associated with quarrying the Baki obsidian exposure was sampled in a small test excavation (Specht *et al*., 1989: 23–25; Torrence *et al*., 1990; Torrence, 1992a). The streambed has also produced many surface finds thought to be of early to late Holocene age (e.g., Torrence, 1992b; Torrence *et al*., 1990; Torrence & Summerhayes, 1997; Araho, 1996; Araho *et al*., 2002; Rath & Torrence, 2003). The streambed carries water only after rain, flushing sediment and artefacts downstream to the mudflat in front of the plantation workers' housing compound. The FAP sherd might have come from the same context as two plain sherds found on the mudflat (site FRH).

FAQ

Garua Island. This is the top of an inland ridge running south to the coastal plain (Specht *et al*., 1989: 13). A plain sherd found on the surface is probably of recent origin as no sherds were found in adjacent test pits (Torrence & Stevenson, 2000: 336). Plain body sherds were found further downhill in layer 2 of pits 95E/0N and 95E/49N, and in pits B8 (layer 3 spit 2) and B9 (layer 4 spit 2) (cf. Torrence & Stevenson, 2000: fig. 1). There are no dates for these pits, but nutshell from layer 3 spit 3 of pit 95/210, a context without sherds, gave 2760–2450 cal. BP (Beta-72140) (Torrence & Stevenson, 2000: table 1).

FAS

Garua Island. Sherds and obsidian flakes were found in an erosion gully running through the coconut plantation down to an unnamed beach on the south side of Garua. Test pits in 1993 and 1997 did not locate a pottery bearing deposit, and the sherds are probably re-deposited by a recent alluvial fan (Torrence & Boyd, 1997: 17; Torrence & Stevenson, 2000: 335–336). The surface sherds include rims with a relief band and two vertical bars, a notched lip and a plain lip, and a fingernail impressed body sherd. Additional refs: Torrence, 1993a: 8; 2002.

FAU

Point Doro, Garua Island. Point Doro is a small peninsula of volcanic rock in the northwest part of Garua, where a single plain body sherd and a scatter of obsidian debitage were found in the inter-tidal zone. Examination of the small peninsula and the adjacent mainland did not reveal any other sherds, and the site is considered to be re-deposited.

FCH

Rala Bay, Bamba village. Witere and Nabodu are volcanic sand beaches extending for several hundred metres along the northern and eastern sides respectively of the 4–5 m high promontory on which part of Bamba village stands. A dentate-stamped sherd was found on Nabodu beach, and heavily weathered sherds and obsidian stemmed tools and debitage were recovered at Witere (Specht, 1973: 446, 1974: fig. 2; Specht *et al*., 1988: 11; Araho, 1996; Araho *et al*., 2002). On both beaches the finds were in the inter-tidal zone. A Bamba resident claimed that sherds eroded from the cliff composed of tephras and palaeosols behind Nabodu, but inspection did not reveal any sherds or evidence for a cultural horizon (Specht & Fullagar, 1988; Specht *et al*., 1988: 11).

FCN/FCO

Point Mondu, Talasea Station. This promontory is an outcrop of volcanic rocks joined to the mainland by a raised coral reef platform (Plates 2 and 4; Specht *et al*., 1991: fig. 1, identified as FCO). This coral is dated to 5470–4970 cal. BP (Beta-72856). Oyster shells attached to rocks and weathered coral pinnacles at 1.1 m above present sea level on the promontory suggest a period of uplift (Plate 5). A sample of this coral is dated to 650±60 bp (435–140 cal. BP; Beta-56978), and one of the oyster shells to 630±60 bp (430–110 cal. BP; Beta-56979) (Boyd & Torrence, 1996: appendix 1, Phase 6, report the shell date as an uncalibrated age of "c. 650 BP").

Two areas of the promontory were originally assigned site codes (FCN and FCO), but a follow-up inspection showed they are parts of one site destroyed by quarrying limestone for road surfacing material. A rim sherd with dentate-stamped designs on both the interior and exterior, plain sherds, obsidian flakes and a flaked stemmed axe blade made from pale green vitric tuff were found on the northern and eastern beaches and in the quarried area (Specht, 1974: fig. 4).

FCP

Bola village. This is a muddy beach with a back swamp on the mainland opposite Depa Island, about 1km southeast of Talasea. Weathered plain sherds, obsidian and shells extend at least 50 m along the inter-tidal zone.

FCQ

Lagenda wharf, Bola village. Pottery and obsidian were found in the inter-tidal zone of the beach around the old wharf of the former Santa Monica Plantation, about 1.5 km southeast from Talasea. The site extends at least 200 m along beach and into mangrove swamp at the northern end, but no artefacts were noted above high tide level. The inter-tidal scatter might link with FCR/FCS, but mud obscures the beach and reef flat.

FCR/FCS

Lagenda, Bola village. This is located in the Lagenda area of the former Santa Monica Plantation opposite Garua Island (Specht, 1974). A detailed description of the site and the finds is given in Specht (2007). The site was originally recorded as two areas that were later combined into a single unit. The FCR area extends along about 150 m of the muddy inter-tidal zone and beach (FCR/A), and detritus from crab burrows contained sherds up to about 10 m inland (FCR/B) (Specht, 2007). In 1973, the FCS area to the south and east of FCR had been quarried down to the water table to extract coral limestone for road surfacing. By 1981 FCR had also been destroyed (Specht *et al*., 1981: 8). The FCS quarry was about 125 m long and extended inland for about 50 m. Profiles up to 3 m high on the inland side showed about 1.5 m of bulldozer "push" over c. 1.5 m of sand, tephra and soil, but no sign of a pottery horizon. Pottery, obsidian and various other stone artefacts were found in the inter-tidal zone and quarry area, and two sherds were found several hundred metres further south on a mudflat near Bola village. When last visited in 1988, the quarry pits were partially filled by sediments from the surrounding exposures and supported small trees and other vegetation.

The pottery site was probably situated on sand over the limestone platform. Its size is not known, as the spread of cultural materials along several hundred metres of beach and reef is probably the result of quarrying and wave action. Surface collections yielded over 750 sherds, of which 417 show aspects of form or decoration. Anson (1983, 1986) included 58 of these in his study of Lapita pottery in the Bismarck Archipelago, and assigned them to his "Far Western Bismarck Lapita Province" (Anson, 1986: 162). The obsidian artefacts include flakes, several stemmed tools and two bifacial points, some of which must pre-date Lapita pottery (Specht, 1974: fig. 3a; Araho *et al*., 2002: 74, fig. 13; Torrence, 2003: fig. 18.3). Other stone finds include a piece of chalcedony, six ground stone axe or adze fragments made from tuffs, and two flaked stems of dacite (FCR/B) and quartzite or tuff (FCS/C/23) (Specht, 1974, 2007). Additional refs: Specht *et al*., 1988: 11; Specht *et al*., 1991: 287.

FCT

Lagenda Island, Bola village. The small island of Lagenda opposite FCR/FCS is formed by an uplifted coral limestone platform with a maximum elevation of about 2–3 m above high tide level. The island is about 175 m long and up to 75 m wide. Sherds and obsidian flakes were found on the southern side in a small bay fringed with mangroves; no sherds were found on land.

FCU

Depa Island, Bola village. This tiny island is formed by an uplifted coral limestone platform capped by tephras and soils to about 2–3 m above sea level. Heavily weathered plain sherds and obsidian flakes were found in the inter-tidal zone of the southern beach, but none were recovered on land.

FCV/FCW

Rala Bay, Bamba village. Just north of Bamba village a small stream runs across a beach covered with volcanic boulders (FCV/A) with a low promontory (FCV/B) to the east. To the east of this promontory is another small beach (FCW) backed by a low cliff of tephras and soils. A freshwater spring at the base of the cliff forms a small stream across the beach. Heavily weathered plain sherds and obsidian flakes were recovered in the inter-tidal zone on both beaches. Other finds included two pieces of chalcedony and struck flakes of grey tuff and quartzite. Inspection of exposures in the small promontory and behind the beaches did not reveal a cultural level.

FCY

Garua Island. This is an unnamed beach on the southwest coast of Garua where there is a scatter of weathered sherds and obsidian in the inter-tidal zone and in a test pit (Torrence & Boyd, 1996: 9). The site area was subsequently extended inland to include the coastal plain as far as site FAAJ on the coastal escarpment (Torrence & Boyd, 1997: 18). The area is part of a gravel fan of late Holocene age, which probably transported the pottery finds to the beach and inter-tidal zone from a location on the coastal plain or the escarpment.

FDC

Bele Bay, Volupai village. This small embayment north of Volupai village faces westwards across the fringing reef to Riebeck Bay (Specht *et al*., 1991: fig. 1). An erosion gully cuts across the narrow beach. Sherds and obsidian flakes were found in the inter-tidal zone and gully area, and perhaps derive from a locality on or in the cliff behind the beach. One plain body sherd could be from a recent Madang pot.

FDK

Nariri Beach, Bitokara. The beach at the point where a road goes up to Bitokara Mission is covered with volcanic boulders, including large obsidian blocks. Obsidian flakes and a rim sherd with dentate-stamping, impressed circles and plain stamp impressions were found in the inter-tidal zone (Specht *et al*., 1988: 11). The source of the sherd is not known. The narrow strip of level ground behind the beach has been built up for road construction, which may have concealed other archaeological materials. On the inland side of the road there is a steep escarpment rising about 40 m to Bitokara Mission.

FDL/FDM

Voganakai village. The road from Talasea into Voganakai approaches the village over a hill and down a steep slope (Specht *et al*., 1991: fig. 1, where it is incorrectly identified as FDN). When inspected in 1974, the road surface had been scraped down to a hard clay surface on which were several sherds and obsidian flakes in two areas. These were initially recorded separately but are now combined. The road cutting did not reveal a cultural deposit.

FEA

Boduna (Observation) Island, Pangalu village. The entire island is a Lapita pottery site, with sherds and obsidian flakes extending across the island and into and below the inter-tidal zone (Plate 1). The total area is thus about 11–12,000 m^2, about twice the size listed in Anderson *et al*. (2001: table 1). Four separate investigations in 1980, 1985, 1989 and 2001 concluded that the site has been disturbed by human and natural agencies, including an earthquake, a tsunami and megapode nesting, though vestiges of a pottery sequence can be discerned (Ambrose & Gosden, 1991; White *et al*., 2002; Specht & Summerhayes, 2007).

This is the richest Lapita site in the Talasea area, with over 8,000 sherds (>30 kg) from excavations and surface collections. Specht & Summerhayes (2007) provide a comprehensive discussion of the site, its dates and finds. The decorative techniques sherds include dentate- and plain-stamping, linear incision, circle impressions, excised triangles, cutout, relief flanges and knobs, and three relief modeled heads with dentate-stamped decoration resembling tattooing (Torrence & White, 2001). The basal layer 4 has three dates on marine shells (Ambrose & Gosden, 1991; Specht & Gosden, 1997). The basal date for layer 4 in the 1989 excavation is 3340–3000 cal. BP (Beta-41578), and two dates for the upper part of layer 4 from the 1985 excavation give a calibrated pooled mean of 3050–2750 cal. BP (Specht & Summerhayes, 2007: table 1). A fourth shell date (Wk-9936) from a level stratigraphically equivalent to layer 4 near the beach gave a result of 3180–2810 cal. BP (White *et al*., 2002: table 2; Specht & Summerhayes, 2007: table 1). Ambrose and Gosden (1991) describe the pottery as "Western Lapita," whereas White *et al*. (2002: 106) compare other sherds to the "Far Western Lapita" stage. Additional refs: Anson, 1983; Specht *et al*., 1988: 11; Specht *et al*., 1989: 13–16; Specht *et al*., 1991: 287–288.

FEI

Garua Island. This is an unnamed beach and mudflat on the southwest side of Garua just north of FEK, with very weathered plain sherds, obsidian flakes and an irregular flaked block of chert in breccia in the inter-tidal zone (Torrence & Boyd, 1996: 9). The site probably consists of re-deposited materials.

FEK

Garua Island. This is a small, unnamed beach below Mt America on southwest Garua situated at the edge of the late Holocene gravel fan that underlies the present coastal plain (see FCY). Sherds (one with fine dentate-stamping) were found in the inter-tidal zone near a freshwater stream (Torrence & Boyd, 1996: 8–9). A test pit in 1993 did not produce sherds, but yielded a "modern" 14C date (NZA-3933) under about 1 m of reworked sediments. As with FCY, the sherds have probably been re-deposited from a locality on the coastal plain or from the escarpment above the plain. Torrence and Stevenson (2000: 335; White *et al*., 2002: 106) assign the finely dentate-stamped sherd to "Far Western Lapita." The stem of a broken stemmed tool made from chert was found in this area, along with many obsidian artefacts (Rath & Torrence, 2003).

FEL

Mangrove Point, Garua Island. This is a re-deposited site on northeast Garua facing Garala Island. Swadling *et al*. (1992: 64) list another site with sherds and obsidian (FPG) in this general area, but this seems to be a duplication of FEL. Mangrove Point is a low-lying area under coconut palms and bamboo, above a volcanic sand beach on its northern side and an inter-tidal mudflat along its eastern side. The area takes its name from mangroves growing on this mudflat. The ground surface rises to about 7 m or more above sea level on the landward side. The mudflat was formed by sediments washed out from a 3–5 m deep erosion gully that marks the southern edge of the site. Sherds with dentate-stamping, applied relief and incision, obsidian flakes and part of a ground adze blade made from tuff with carbonate veins were found on the mangrove mudflat and inter-tidal zone.

Test trenching and augering in 1989 showed that Mangrove Point consists of extensively reworked tephras, tephra-derived soils and clays (Specht *et al*., 1989: 10–11). In trench I the water table was reached at 60 cm below ground surface and excavation ceased at about 153 cm below surface in reef detritus and sand. Augering showed that the underlying coral reef platform is about 175cm below ground surface. Trench II, located inland from I, did not reach the water table, even though excavation ceased at 154 cm below surface and the reef platform was located by augering at 260

cm below surface. As in trench I, the deposit was formed by reworked tephras and soils and, at the bottom of the auger hole, sticky off-white clay similar to the pyroclastic flow cut by the road that gives access to the area. Only 17 sherds were found in trench I, all above or at the water table level; there were no sherds in trench II. In addition to many obsidian flakes in both trenches, a broken stemmed obsidian tool was found in the topsoil of trench II. Several other stemmed obsidian tools and relief-decorated sherds were found in the outwash of the gully on the south side of FEL.

The site was probably formed by the collapse of the hill on its western side, on top of which is located the FAO site and an obsidian source of low to medium quality (see FAO). This hillside has a massive landslide scar suggesting a relatively recent collapse. This is supported by two dates from test trench I (Specht & Gosden, 1997: 177, appendices 1 and 2). Waterlogged wood (NZA-1979) at 121–153 cm depth yielded a "modern" radiocarbon date of 76±56 bp, whereas charcoal (Beta-42526) from a higher level was much older at 1050±80 bp. The basal date places the landslide within the last 150 years, and could reflect erosion following the conversion of Garua Island into a coconut plantation in 1923 (Hore-Lacey, 1992: 14–15). Elsewhere on Garua, plantation activities (and, formerly, cattle-raising) continue to cause comparable severe erosion (Boyd & Torrence, 1996). Additional ref.: Specht *et al*., 1988: 11.

FEM

Garala (Schaumann) Island, Pangalu village. Garala is a small island of volcanic origin with an obsidian flow at its eastern end (Plate 2). It is about 500 m east of Garua Island and separated from it by extensive coral reef flats. The site is located at the western end of Garala, where weathered dentate-stamped sherds, obsidian flakes and a flaked piece of ignimbritic tuff were found in the inter-tidal zone and shallow water and on the beach. A stemmed obsidian tool was also recovered (Araho, 1996: 74, table 2). PIXE-PIGME analysis allocated this to the Kutau-Bao obsidian source on the mainland, but obsidian flakes found with the stemmed tool were assigned to the Baki obsidian source, an outcrop of which occurs on Garala (Torrence *et al*., 1990: table 1; Torrence & Summerhayes, 1997: table 1). Shovel pits 1 m deep on and behind the beach reached groundwater at about 50 cm depth, but no cultural materials were found below ground surface. Bedrock was not reached. Torrence (1993a: 9) reports that the island is undergoing uplift. Additional ref.: Specht *et al*., 1988: 11.

FOV

Garua Island. This is a scatter of nine plain sherds in the disturbed part of a small hill on the south side of Garua that has been quarried for road fill. Two test pits of 1 m^2 each were excavated, as this area is above the inter-tidal scatter of obsidian and sherds of FXO (see below). The test pits yielded obsidian flakes and pieces of unworked Hamilton obsidian, but no evidence for pottery (Torrence, 1993a: 8).

FOW

Garua Island. This site is on a beach below a steep cliff on the east coast of Garua to the south of FEL. Plain sherds were found in the inter-tidal zone, probably re-deposited from the cliff top (Torrence & Boyd, 1996: 10).

FQD

Langu (Binnen) Island, Bamba village. Langu is a small island in Garua Harbour opposite Bamba village (Plates 1, 2). It consists of a core of volcanic rock fringed by uplifted coral reef rising about 4 m above sea level. The top of the island was used for a garden when visited in 1988. Weathered sherds, some with dentate-stamped designs, and obsidian flakes were found in the inter-tidal zone on the south side at low tide (Specht *et al*., 1988: 11). A shovel pit on the beach at low tide reached the water level at 52 cm down and stopped at 107 cm depth. Heavily worn sherds, some with dentate-stamping, were found on the surface and in the top few centimetres of the shovel pit. One obsidian flake was found at c. 100 cm depth.

FQR

Nahaba hamlet, Ngarumatala village. This settlement is on steeply sloping ground to the south of Bitokara Mission on the slopes of Mount Kutau. House construction in 1988 produced a broken but almost complete pot that is stylistically related to the modern pottery of the Watut Valley region, Morobe Province, on mainland Papua New Guinea (Specht *et al*., 1991: 289; Fischer, 1962). Examination of an old posthole showed no evidence for a cultural level down to 60 cm below ground surface.

In 1988, the family of Leo Metta living near Nahaba owned a pot traded from the Madang area of the New Guinea mainland (Torrence *et al*., 1990: 461).

FQW

Beto (Poeto), Kapugara Oil Palm Block 1975. This is an ancestral site of the Bakovi people of the Talasea area that was last occupied about 60–70 years ago (Specht *et al*., 1991: 289). It is on a small ridge and slope in tall regrowth vegetation. Surface finds included many shells, heat-retaining stones and obsidian flakes, and one incised sherd. The sherd resembles recent trade wares from the Sio-Gitua pottery centres in Morobe Province, mainland Papua New Guinea. The site was recorded in 1988 as Beto, but is listed as "Poeto" by Swadling *et al*. (1992).

FQY

Gola's Gully, Garua Island. Road ditches and gullies across the narrow coastal plain to the north of the Plantation compound contain dentate-stamped and incised sherds, obsidian flakes and fragments of ground stone tools. Excavations in 1992–93 suggested that the site might have been formed by "redeposited slopewash" from the ridge above FQY, where sherds were found in a test pit (Torrence, 1993a: 7). A finely dentate-stamped sherd found in layer 3 of a test pit suggests the presence of an early Lapita deposit

in this area (Torrence & Stevenson, 2000: 335; cf. White *et al*., 2002: 106). There are two dates on nutshell samples: 2795–2460 cal. BP (Beta-72141) for Pit I layer 4 spit 2, and 2330–2050 cal. BP (Beta-112594) for Pit A13 layer 3 spit 3 (Torrence & Stevenson, 2000: table 1). Additional refs: Torrence & Webb, 1992: 10; Boyd & Torrence, 1996: fig. 2.

FQZ

Water pumping station, Garua Island. On the northwest side of Garua a streambed up to 2.5 m deep runs westwards down the hillside and across the narrow coastal plain to the beach. Sherds, including one incised body sherd, and obsidian flakes were found in the streambed near an old pumping station that formerly supplied water for the plantation. As with site FQY, the finds probably came from the hill behind the coastal plain.

FRA

Garua Island. Near the northwestern tip of Garua, between the scoria pit on top of which FSZ is located and the Pumping Station site FQZ, a streambed cuts through the narrow coastal plain. Two sherds (one plain body and one plain rim) were found here, together with obsidian pieces and a stemmed tool. Examination of the outwash fan from the stream revealed obsidian flakes but no further sherds. The single sherd from the streambed could be re-deposited from the hilltop above FRA.

FRD

Mt Baki, Garua Island. This is the second highest point of Garua Island (Plate 7). Three plain sherds were found on the ground surface, and two small, notched rims were recovered from layer 4 spit 1 of TP1 excavated near the top of the hill (Torrence, 1993a: 9).

FRH

Plantation Compound, Garua Island. In front of the housing compound for the plantation workers is an extensive inter-tidal mudflat over the reef platform (Plate 7). Two plain sherds found on the mudflat were probably washed down Malaiol stream (site FAP).

FRI

Puro, Walindi Plantation Resort. Walindi Plantation Resort faces north across Kimbe Bay and consists of a coastal flat and a series of steep ridges and ravines running down from Mount Garbuna (Plate 9). The plantation was formerly Kilu village land and includes the Kilu ancestral site of Puro. Sherds, including several dentate-stamped examples (Specht *et al*., 1988: 11; Torrence *et al*., 1990: 462), and obsidian flakes were revealed at Puro during the construction of access paths for planting oil palms in the late 1980s (approximately in the centre of Plate 9). One sherd of possible recent Madang pottery was also found (Specht *et al*., 1991: 289).

Two test trenches in 1989 showed a sequence of basal brown clay with obsidian flakes sealed by W-K2 tephra, with plain sherds and obsidian in its palaeosol, and an earth oven on the palaeosol surface (Specht *et al*., 1989: 7–10). This was sealed by mixed W-K3, W-K4 and possibly W-H series tephras and soils, and topsoil (Machida, 1991). Two samples from layer 3 spits 2 and 3 in the W-K2 palaeosol gave dates of 2110–1830 cal. BP (charcoal—Beta-34208) and 2320–1970 cal. BP (nutshell—Beta-41590) respectively (Specht *et al*., 1991: 287; Specht & Gosden, 1997: table 1). These two dates are statistically the same at the 95% confidence level.

By 1998, the Plantation was under the management of New Britain Palm Oil Ltd, which terraced the ridges and constructed additional access roads. This work exposed several dentate-stamped and plain sherds and obsidian flakes on two ridges to the north of the 1989 excavation (to the right hand side of Plate 9). Some of the decorated sherds, which are included in FRI, are stylistically similar to those of FCR/FCS and may indicate an early Lapita presence on the ridges. Additional refs: Fullagar, 1992; Symons, 2003.

FRJ

Valahia Island, Pasiloke village. This is one of several small low-lying coral limestone islands off Pasiloke village, one of which protects Valahia from heavy northerly swells (Specht & Fullagar, 1988). On the north side of Valahia is a small muddy beach with mangrove vegetation. Heavily weathered sherds and obsidian flakes were found on the beach and in the inter-tidal zone, but a shovel pit down to 60 cm below the water table did not reveal a sub-surface cultural deposit. While the pottery can be allocated to the Lapita ceramic series, its position within the series is unclear (Specht *et al*., 1989). Additional refs: Specht *et al*., 1988: 11; Specht *et al*., 1991: 288.

FRL

Bitokara Mission church. The mission stands on the leading edge of a lava flow from Mount Kutau at about 40 m above sea level (Plate 1). The Bitokara-Waru road passes in front of the church, and several sherds and obsidian were found on the edge of the road (Specht *et al*., 1988: 11). This area is about 30 m from a test trench that did not contain pottery (Specht *et al*., 1988; Specht & Fullagar, 1988: 6). As the road surfacing consists of crushed coral, the sherds might be derived from the pottery deposits at Point Mondu (FCN/FCO) or Lagenda (FCR/FCS), and the site is listed as re-deposited (Specht *et al*., 1988: 11).

FSZ

Scoria Pit hill, Garua Island. This is a hilltop on northwest Garua above a scoria quarry for road surfacing on Garua (Plate 8). The Plantation stripped topsoil from the hill and exposed sherds, obsidian flakes, heat retaining stones and fragments of ground stone tools. Torrence (1992b, 1993a, 1993b, 1993c) excavated the site in 1992–93 and recovered over 4,500 sherds; some of those from the 1992 excavations were included in Summerhayes' (2000a) study of Lapita sites in West New Britain. The sherds included dentate-stamped, plain stamped, incised, shell-edge impressed, fingernail impressed, circle impressed and applied relief decorated sherds (knobs, notched bands), and flat-based bowls (Torrence, 1993c; Torrence & Webb, 1992: 5; Summerhayes, 2000a: figs 9.2–9.4). The cutout sherd listed by Summerhayes (2000a: table 9.7) is now treated as a

flat-lipped rim. There are several sherds that have very long dentate-stamped impressions, and others could be either dentate-stamped or shell-edge impressed. One unusual notched rim sherd (FSZ/2622) from spit 1 of 15/94 has a red slip and dentate-stamped designs on both surfaces (Summerhayes, 2000a: fig. 9.3).

There are nine dates ranging from 3060–2760 cal. BP (NZA-6099; layer 1 spit 2 of Pit 13/92) to1195–960 cal. BP (Beta-72143; layer 2 spit 1 in Pit 17/83) (Torrence & Stevenson, 2000: table 1). Beta-72143 refers to an aceramic level post-dating the Dk tephra. On decorative grounds, Summerhayes (2000a: 231) places FSZ in the late group of West New Britain Lapita sites and assigns some material to the "Post-Lapita Transition" (Summerhayes, 2004: table 2). Other dentate-stamped sherds, however, belong stylistically to an earlier stage of Lapita, consistent with the age of NZA-6099.

FXO

Garua Island. On the south coast of Garua there is an unnamed beach with a freshwater spring below the hilltop site FOV, between sites FEK and FAS. Weathered plain sherds, six notched rims, a grooved rim with dentate stamping and obsidian flakes were found in the inter-tidal zone. Initially it was thought that the sherds at FXO had washed down from site FOV (Torrence, 1993a: 8), but as no sherds were recovered from two test pits at FOV, the FXO sherds may represent an inter-tidal site (Torrence & Boyd, 1997: 14–15) or possibly material washed down from FAAN.

FYS

Garua Island. This unnamed beach on southeast Garua has a low coral platform terrace covered with calcareous sand, tephra and soils (Plate 12). The seaward edge of these sediments has been cut by wave action, depositing sherds and obsidian flakes in the inter-tidal zone Torrence, 1993a: 8–9; cf. Torrence & Stevenson, 2000: 335). Torrence and Stevenson (2000: 335) state that only two notched rims and two incised body sherds were found in test pits on the terrace. Re-examination of the surface and excavated finds reveals two dentate-stamped rims (both form I bowls), one from the beach and one in TP2 layer 5 spit 3 on the terrace. Two incised sherds and a notched rim were found in TP1 layer 5 spits 2 and 3. Carbonized nutshells from layer 5 of TP2 gave some of the oldest dates for pottery in the Talasea area: 3220–2850 cal. BP (NZA-3733) for spit 1 (plain sherds only), 3390–3080 cal. BP (Beta-72144) for spit 3 (dentate-stamped rim), and 3380–3060 cal. BP (NZA-3734) for spit 4 (no pottery) (Torrence & Stevenson, 2000: table 1). Beta-72144 and NZA-3734 give a pooled mean age of 3370–3140 cal. BP. These dates suggest the presence of an early Lapita site, the seaward part of which has been eroded by wave action.

FAAI

Garua Island. This is located in the inland upland of Garua. Two sherds with fingernail impressions and a notched rim were found in a test pit.

FAAJ

Garua Island. This site is on the escarpment above the coastal plain on west Garua, inland from FCY. Plain sherds were found in a gully floor, and a small test pit excavated on top of the escarpment adjacent to the gully yielded a notched rim and a fingernail impressed body sherd (Torrence & Boyd, 1996: 9–10). Nutshell from layer 5 spit 1 is dated 1900–1710 cal. BP (Beta-102970), and charcoal from spit 2 is dated 2490–2000 cal. BP (Beta-102971) (Torrence & Stevenson, 2000: table 1).

FAAK

Garua Island. This is an inland, upland location between Mt Hamilton and Mt America on the western side of Garua Island. Layer 4A of a test pit yielded a flat-lipped rim sherd and an incised body sherd. These sherds are older than two dates on nutshells of 2330–2120 cal. BP (Beta-102965) for layer 3 spit 3, and 2180–1995 cal. BP (Beta-102966) for layer 3 spit 4 (Torrence & Stevenson, 2000: table 1).

FAAL

Garua Island. This is a scatter of six sherds, many obsidian stemmed tools and other retouched forms in an outwash fan on the east side of Garua. About 60% of the obsidian came from the Baki source on Garua (Rath & Torrence, 2003: table 2). The sherds include dentate-stamped, incised, fingernail impressed and punctate decoration, and were probably washed down from the cliff top above the beach (Torrence & Boyd, 1996: 10, 1997: 15).

FAAN

Garua Island. This area includes part of the coastal plain and the plateau above it in southwest Garua close to the quarried area FOV, and above the inter-tidal sherd scatter of FXO. Three test pits on the plain produced 140 sherds (Torrence & Boyd, 1997: table 1, pits D5–D7), including dentate-stamped, fingernail impressed, punctate, notched lip and possibly shell impressed and incised sherds. Plain sherds in layer 6 spits 2 and 4 in pit D7 are dated on nutshells to 2520–2150 cal. BP (Beta-112607) and 2970–2680 cal. BP (Beta-112608) respectively. Pit D3 on the plateau above D5–D7 had only plain sherds, for which nutshell from layer 4 spit 2 gave a date of 2210–1950 cal. BP (Beta-102969) (Torrence & Stevenson, 2000: table 1). The sherd scatters at FOV and FXO might have been derived from FAAN.

FAAP

Garua Island. This is an inland hill where two plain sherds were found in a test pit.

FAAQ

Garua Island. This locality comprises a plateau that slopes gently downward to the south from Mount Baki. Here, seven out of the 12 test pits excavated along 700 metres of this slope yielded about 170 sherds (Torrence & Boyd, 1997: table 1, pits G1 to G12; Torrence, 2002: fig. 4). There are

four dates on nutshell (Torrence & Stevenson, 2000: table 1): 1870–1590 cal. BP (Beta-112602) for plain sherds and a scalloped rim in layer 4 spit 2 of G2; 2620–2350 cal. BP (Beta-112598) for a dentate-stamped sherd in layer 5 spit 3 of G5; 2160–1820 cal. BP (Beta-112603) for dentate-stamped and incised body sherds and a notched rim in layer 3 spit 2 of G11; and 2340–2100 cal. BP (Beta-112597) for incised and fingernail impressed body sherds and a notched rim in layer 2 spit 1 of G12. Shell impressions and applied relief bands are also present in other pits.

FACL

Lotomgam Plantation. This plantation is located on the east side of the peninsula, extending from the beach to the foothills (Plate 1). The plantation was formerly under coconuts, but has now been converted to oil palm. Construction of a road on one of these hills has exposed a site with plain pottery and obsidian (Torrence, 2000; Torrence *et al*., 2001: 16–17).

No site code

Murikape, Patanga village. Anderson *et al*. (2001: table 1) list this site as FEB, which is an obsidian flaking area without pottery in a sulphur-bearing stream between Patanga and Bola villages (Specht & Koettig, 1981). Murikape is the current cemetery area of Patanga on a hilltop some distance from the beach. The site is known only by a report to John Normu (Provincial Cultural Centre) of finds made in 1986 during grave digging (Specht *et al*., 1988: 11). As requests for permission to visit the site have been refused, it has not been allocated a code. The finds consist of several human bone fragments and a red-slipped sherd with dentate-stamped and incised or plain stamped decoration. Normu was told that the bones and sherd were recovered in “sand” (presumably tephra). In view of the generally poor preservation of organic materials in the tephra-derived soils of the Talasea area, the bones probably relate to a post-pottery burial. Additional ref.: Specht *et al*., 1991: 288.

Appendix 2

FSZ sherds

Summerhayes (2000a: figs 9.2–9.4) illustrated 31 sherds excavated at FSZ in 1992, but did not include provenance details. These are provided below, with additional notes.

Summerhayes' (2000a) figure 9.2:

1275: FSZ 13/93, layer 1 spit 2
3274: FSZ 14/88, layer 1 spit 1 (NZA-2851: 2465–2130 cal. BP).
940: FSZ 13/95, layer 1 spit 2, exterior red slip.
2163: FSZ 14/93, layer 1 spit 2
256: FSZ 12/94, layer 1 spit 1
3056: FSZ 15/93, layer 1 spit 2; this is shown as a shoulder, but it could be a flat base. The arcs are probably dentate-stamped.
3255: FSZ 15/92, layer 1 spit 3
2464: FSZ 14/92, layer 1 spit 3
1620: FSZ 14/95, layer 1 spit 1
1101: FSZ 13/94, layer 1 spit 2
1927: FSZ 14/94, layer 1 spit 1

Summerhayes' (2000a) figure 9.3:

2622: FSZ 15/94, layer 1 spit 1
2511: FSZ 15/95, layer 1 spit 1
578: FSZ 12/92, layer 1 spit 1; this sherd could be inverted.
1406: FSZ 13/92, layer 1 spit 1 (NZA-6098: 1875–1560 cal. BP).
2160: FSZ 14/93, layer 1 spit 2
469: FSZ 12/93, layer 1 spit 3; originally a rounded lip rim that was broken after excavation. It joins sherds 471 and 473, which extend the decoration downwards as two vertical lines of dentate-stamping with a small impressed circle between them.
801: FSZ 13/95, layer 1 spit 1
400: FSZ 12/94, layer 1 spit 3
2035: FSZ 14/94, layer 1 spit 3
1102: FSZ 13/94, layer 1 spit 2. The shoulder angle has slash lines or notches.
118: FSZ 12/95, layer 1 spit 2, exterior red slip.
257: FSZ 12/94, layer 1 spit 1
2900: FSZ 15/93, layer 1 spit 1
2097: FSZ 14/93, layer 1 spit 1
2102: FSZ 14/93, layer 1 spit 1
3055: FSZ 15/93, layer 1 spit 2

Summerhayes' (2000a) figure 9.4:

3260: FSZ 15/92, layer 1 spit 3
2767: FSZ 15/94, layer 1 spit 2
1952: FSZ 14/94, layer 1 spit 2.
5: FSZ 12/95, layer 1 spit 1.

Appendix 3

Provenance and other details of sherds illustrated in Figures 4–15

This Appendix provides for each sherd illustrated in Figures 4–15 details regarding its site and recovery context. For excavated sherds, the Appendix lists the trench (e.g., 100/100, TP2) and excavation unit (e.g., layer 4 spit 3), sherd catalogue number where available, a brief description of the vessel form and decorative technique, and reference to any previous publication. Where there is a radiocarbon age for the excavation unit, this is cited as a calibrated range at 2σ with the laboratory sample number. "WNB-CC" identifies sherds held in the West New Britain Provincial Cultural Centre, Kimbe.

Figure 4. Excavated sherds from FAO.

(*a*) FAO 100/100, layer 4 spit 3: body, plain stamp.
(*b*) FAO 100/100, layer 4 spit 3: body, fingernail impression.
(*c*) FAO 100/100, layer 4 spit 4: rim, form uncertain, scalloped lip.
(*d*) FAO 962/990, layer 2 spit 1: body, dentate-stamp.
(*e*) FAO 970/1000, layer 4 spit 1: body, dentate-stamp.
(*f*) FAO 970/1000, layer 4 spit 1: body, two notched applied relief bands.
(*g*) FAO 970/1000, layer 4 spit 2: rim or base of stand, plain.
(*h*) FAO 970/1000, layer 4 spit 2: body, dentate-stamp.
(*i*) FAO 970/1000, layer 4 spit 2: body, dentate-stamp, notched applied relief band.
(*j*) FAO 970/1000, layer 4 spit 2: shoulder, fingernail impression (plus two other examples from this level).
(*k*) FAO 970/1000, layer 4 spit 3: rim, form uncertain, red slip, single-notch lip.
(*l*) FAO 970/1000, layer 4 spit 3: body, dentate-stamp.
(*m*) FAO 970/1000, layer 4 spit 3: body, dentate-stamp, plain stamp.
(*n*) FAO 970/1000, layer 4 spit 3: body, dentate-stamp.
(*o*) FAO 970/1000, layer 4 spit 3: body, dentate-stamp.
(*p*) FAO 970/1000, layer 4 spit 3: body, incision.
(*q*) FAO 970/1000, layer 4 spit 3: rim, possibly form VI, applied relief band and knob.
(*r*) FAO 970/1000, layer 4 spit 3: shoulder, applied relief knob.
(*s*) FAO 970/1000, layer 4 spit 3: applied relief band fragment, double-toothed impressions.
(*t*) FAO 970/1000, layer 4 spit 3: rim, form uncertain, single-notch lip, incised lines from lip.
(*u*) FAO 970/1000, layer 4 spit 3: rim, form uncertain, single-notch lip (plus five other examples from this level).
(*v*) FAO 970/1000, layer 4 spit 3: shoulder, fingernail impression.
(*w*) FAO 970/1000, layer 4 spit 3: shoulder, fingernail impression.
(*x*) FAO 970/1000, layer 4 spit 3: shoulder, fingernail impression (plus four other examples from this level).
(*y*) FAO 989/1010, layer 3 spit 1: rim, form uncertain, single-notch lip.
(*z*) FAO 989/1010, layer 3 spit 3: rim, form VII, plain (hard, grey, possibly Type Y).
(*aa*) FAO 989/1020, layer 4 spit 4: shoulder, fingernail impression.

Figure 5. Excavated and surface sherds from FAO.

(*a*) FAO 990/970, layer 3 spit 2: shoulder, fingernail impression.
(*b*) FAO 990/970, layer 3 spit 2: shoulder, fingernail impression.
(*c*) FAO 990/990, layer 3 spit 2: shoulder, fingernail impression (NZA-3729: 2715–2350 cal. BP).
(*d*) FAO 990/1000, layer 2 spit 2: rim, form uncertain, plain.
(*e*) FAO 990/1000, layer 2 spit 2: body, incision.
(*f*) FAO 1000/999, layer 3 spit 2: shoulder, plain.
(*g*) FAO 1000/1010, layer 3 spit 3: body, incised.
(*h*) FAO G13/1, layer 3 spit 1: body, dentate-stamp, plain stamp (Torrence *et al*., 1990: 462).
(*i*) FAO G13/58, surface: body, dentate-stamp.
(*j*) FAO E3, layer 5 spit 1: body, dentate-stamp (Beta-112593: 2350–2150 cal. BP).
(*k*) FAO E6 layer 3 spit 1: body, circle impression.
(*l*) FAO surface: body, dentate-stamp.
(*m*) FAO surface: body, coarse dentate-stamp.
(*n*) FAO 1995, road below site: body, applied relief knob and band.
(*o*) FAO 1995, road below site: body, circle impression.
(*p*) FAO 1995, road below site: body, fingernail impression.
(*q*) FAO 1995, road below site: body, fingernail impression.
(*r*) FAO 1995, road below site: body, deep fingernail impression or gouged.
(*s*) FAO 1995, road below site: body, fingernail impression.

(*t*) FAO 1995, road below site: rim, probably form I, single-notch lip, notched applied relief band.
(*u*) FAO 1995, road below site: body, fingernail impression.
(*v*) FAO 1995, road below site: body, dentate-stamp, notched applied relief.
(*w*) FAO 1995, road below site: rim, form uncertain, applied relief band cut into squares.

Figure 6. Surface sherds from FAS, FCH, FCN/FCO, FCT, FCV/FCW, FDK, FCY and FDL/FDM.
(*a*) FAS, surface: rim or base of vessel stand, plain.
(*b*) FAS, surface: shoulder, plain.
(*c*) FAS, surface: shoulder, fingernail impression.
(*d*) FAS, surface: rim, form uncertain, applied relief strips.
(*e*) FCH/519, surface: rim, possibly form VII, scalloped lip.
(*f*) FCH West, surface: rim, form VI, single-notch lip.
(*g*) FCH/473, surface: flat base angle or ledged shoulder, plain (heavy abraded).
(*h*) FCH/264, surface: body, dentate-stamp, circle impression.
(*i*) FCN/FCO, surface: rim, form uncertain, traces of dentate-stamped "rope" band on interior and exterior (Specht, 1974: fig. 3).
(*j*) FCN/FCO, surface: rim, form uncertain, plain.
(*k*) FCT/13, surface: rebated shoulder, plain (heavy abraded).
(*l*) FCV/FCW/6, surface: shoulder, incision or plain stamp.
(*m*) FCV/FCW/45, surface: body, incision.
(*n*) FCV/FCW/7, surface: body, incision.
(*o*) FCY/2, surface: rim, form VI, plain.
(*p*) FDL/FDM/8, surface: rim, possibly form V, mouth diameter 150–160 mm, single-notch lip.
(*q*) FDK, surface: rim, form I, dentate-stamp, circle impression, plain arc stamp.

Figure 7. Surface sherds from FEK and FEM.
(*a*) FEK, surface: body, very fine dentate-stamp, circle impression.
(*b*) FEK, surface: rim, form VI, plain.
(*c*) FEM/C, surface: rim, form uncertain, plain.
(*d*) FEM/C, surface: rim, form uncertain, plain.
(*e*) FEM/A, surface: shoulder, dentate-stamp.
(*f*) FEM/C, surface: rim, form uncertain, dentate-stamp, incision.
(*g*) FEM/A, surface: rim, possibly form II or VII, plain.
(*h*) FEM/A, surface: shoulder, dentate-stamp.
(*i*) FEM WNB-CC, surface: shoulder, incision.
(*j*) FEM/A, surface: shoulder, incision.
(*k*) FEM/A, surface: body, incision.
(*l*) FEM/A, surface: body, incision.
(*m*) FEM/A, surface: rim, form II or VII, mouth diameter 220–260 mm, double-notch lip.
(*n*) FEM, WNB-CC: shoulder, broad incision or gouged lines.

Figure 8. Surface sherds from FEM and FQD, and excavated sherds from FQY.
(*a*) FEM, WNB-CC, surface: shoulder, plain.
(*b*) FEM/B, surface: body, incision.
(*c*) FEM/B, surface: the curvature of the "base" suggests that this is possibly part of a bowl-on-stand, or it could be a flat-based bowl of form I, plain.
(*d*) FEM/A, surface: shoulder, possible faint dentate-stamped lines above carination.
(*e*) FEM/A, surface: shoulder, plain.
(*f*) FQD (T4/A/5), surface: base of pedestal stand, form VIIIB, surface too heavily abraded to identify whether it was once decorated.
(*g*) FQD (T4/A/1), surface: upper body/neck, form VI, dentate-stamp.
(*h*) FQD (T4/A/8), surface: rim, form VII, mouth diameter 220–240 mm, single-notch lip.
(*i*) FQD (T4/A), surface: body, incision.
(*j*) FQD (T4/A/7), surface: body, dentate-stamp.
(*k*) FQD (T4/A/3), surface: body, incision.
(*l*) FQY I unit 4 layer 3: shoulder, dentate-stamp.
(*m*) FQY TP2 layer 3 at 127 cm: rim, form uncertain, dentate-stamp.
(*n*) FQY TP2 layer 2B/layer 3 top: rim, form uncertain, plain stamp, incision.

Figure 9. Excavated and surface sherds from FQY, FQZ, FRA, FRD, FRI and FRJ.

(*a*) FQY TP2 layer 3 spit 2: body, fingernail impression.
(*b*) FQY 1992, spit 5: body, dentate-stamp, plain stamp.
(*c*) FQY 90/100, layer 3 spit 3: rim, possibly form I, incision, circle impression, single-notch lip.
(*d*) FQY 90/100, layer 3 spit 3: rim, form uncertain, single-notch lip.
(*e*) FQY 100/100, layer 2 spit 6: rim, form VI, plain.
(*f*) FQY 100/100, layer 2 spit 4: body, dentate-stamp.
(*g*) FQY 100/100, layer 2 spit 5: body, incision or plain stamp.
(*h*) FQY 1988, surface: body, broadly incision or gouged.
(*i*) FQZ, surface: body, incised and/or plain stamp.
(*j*) FRA, surface: rim, form VII, plain.
(*k*) FRD TP1, layer 4 spit 1: rim, form uncertain, single-notch lip.
(*l*) FRI 1998, area 3, surface: rim, possibly form I, dentate-stamp, circle impression.
(*m*) FRI 1998, area 3, surface: rim, form I, dentate-stamp, circle impression.
(*n*) FRI 1989, harvesting track at TP1, surface: rebated shoulder, dentate-stamp, circle impression (Torrence *et al*., 1990: 462).
(*o*) FRI 1999, ridge at north end of area 3, surface: shoulder, dentate-stamp.
(*p*) FRI 1998, area 2, surface: body, incised or plain stamp.
(*q*) FRI area 2 1998, surface: body, dentate-stamp, plain stamp.
(*r*) FRJ/2, surface: shoulder, plain.
(*s*) FRJ/3, surface: body, dentate-stamp, plain stamp.

Figure 10. Surface and excavated sherds from FSZ.

(*a*) FSZ/179, surface: rim, form I, shell impression, plain stamp.
(*b*) FSZ/195, surface: rim, form uncertain, dentate-stamp.
(*c*) FSZ spade pit 4, 1998, W-K2 palaeosol: shoulder, dentate-stamp.
(*d*) FSZ, surface, sherd177: body, dentate-stamp, plain arc impression, incision or plain straight stamp.
(*e*) FSZ, surface, sherd 178: body, dentate-stamp, plain stamp.
(*f*) FSZ spade pit 4, 1998, W-K2 palaeosol: body, dentate-stamp.
(*g*) FSZ, surface, sherd 199: body, dentate-stamp, circle impression.
(*h*) FSZ, surface, sherd 114: body, dentate-stamp.
(*i*) FSZ, surface, sherd 198: body, narrow diameter vessel (c. 80 mm), dentate-stamp.
(*j*) FSZ, surface, sherd 198: rim, possibly form VII, single-notch lip.
(*k*) FSZ, surface, sherd 191: body, shell impression, applied relief band on interior.
(*l*) FSZ 1991, surface: body, applied relief knobs.
(*m*) FSZ, surface, sherd 176: body, notched relief band, fingernail impression, incision.
(*n*) FSZ, surface, sherd 190: shoulder, plain.
(*o*) FSZ, surface, sherd 112: body, incision.

Figure 11. Excavated sherds from FSZ.

(*a*) FSZ 13/73, layer 3 spit 1: rim, form uncertain, dentate-stamp or plain stamp, band of plain stamp "rope" on interior below lip.
(*b*) FSZ 13/73, layer 3 spit 1: rim, form uncertain, single-notch lip.
(*c*) FSZ 27/83, layer 3 spit 1: shoulder, dentate-stamp, plain stamp.
(*d*) FSZ 27/83, layer 3 spit 1: body, dentate-stamp.
(*e*) FSZ 27/83, layer 3 spit 1: body, dentate-stamp, possibly part of a "face" design.
(*f*) FSZ 8/95, layer 1 spit 1: rim, possibly form VII, mouth diameter 220–240 mm, fingernail impression, double-notch lip.
(*g*) FSZ 8/95, layer 1 spit 1: body, dentate-stamp.
(*h*) FSZ 8/95, layer 1 spit 2: rim, form II, mouth diameter 140 mm, single-notch lip.
(*i*) FSZ 8/95, layer 1 spit 3: body, dentate-stamp.
(*j*) FSZ 8/95, layer 1 spit 3: rim, form uncertain, plain.
(*k*) FSZ 8/95, layer 1 spit 4: rim, form uncertain, single-notch lip.
(*l*) FSZ 17/96, layer 1 spit 1: round shoulder, dentate-stamp (NZA-3730: 1560–1310 cal. BP).
(*m*) FSZ 17/96, layer 1 spit 2: rim, possibly form I, dentate-stamp, circle impression, plain stamp (NZA-3731: 2620–2300 cal. BP).
(*n*) FSZ 17/96, layer 1 spit 2: rim, form uncertain, dentate-stamp, single-notch lip; single dentate-stamped line on interior (NZA-3731: 2620–2300 cal. BP).
(*o*) FSZ 17/96, layer 1 spit 2: rim of form I, or base of form VIII, incision (NZA-3731: 2620–2300 cal. BP).
(*p*) FSZ 17/96, layer 1 spit 2: body, dentate-stamp, circle impression (NZA-3731: 2620–2300 cal. BP).
(*q*) FSZ 17/96, layer 1 spit 2: body, dentate-stamp, circle impression (NZA-3731: 2620–2300 cal. BP).
(*r*) FSZ 17/96, layer 1 spit 2: shoulder, fingernail impression (NZA-3731: 2620–2300 cal. BP).
(*s*) FSZ 17/96, layer 1 spit 2: body, dentate-stamp (NZA-3731: 2620–2300 cal. BP).

(*t*) FSZ 17/96, layer 1 spit 2: body, dentate-stamp (NZA-3731: 2620–2300 cal. BP).
(*u*) FSZ 17/96, layer 1 spit 2: shoulder, broadly incision (NZA-3731: 2620–2300 cal. BP).
(*v*) FSZ 17/96, layer 1 spit 2: rim, form uncertain, plain (NZA-3731: 2620–2300 cal. BP).
(*w*) FSZ 17/96, layer 1 spit 2: rim, form uncertain, single-notch lip (NZA-3731: 2620–2300 cal. BP).
(*x*) FSZ 17/96, layer 1 spit 3: rim, form uncertain, single-notch lip.
(*y*) FSZ 17/96, layer 1 spit 3: body, plain stamp.
(*z*) FSZ 17/96, layer 1 spit 5: body, shell impression.

Figure 12. Excavated sherds from FSZ.

(*a*) FSZ 17/98, layer 1 spit 3: rim, form I, dentate-stamp, plain stamp (NZA-3732: 1900–1605 cal. BP).
(*b*) FSZ 17/98, layer 1 spit 3: body, dentate-stamp (NZA-3732: 1900–1605 cal. BP).
(*c*) FSZ 17/98, layer 1 spit 3: body, incision (NZA-3732: 1900–1605 cal. BP).
(*d*) FSZ 17/98, layer 1 spit 4: rim, possibly form VII, dentate-stamp, circle impression, plain stamp, single-notch lip.
(*e*) FSZ 17/98, layer 1 spit 4: rim, form uncertain, incision.
(*f*) FSZ 17/98, layer 1 spit 4: rim, form uncertain, single-notch lip.
(*g*) FSZ 17/98, layer 1 spit 4: rim, form uncertain, plain.
(*h*) FSZ 17/98, layer 1 spit 4: rim, form I, plain.
(*i*) FSZ 17/98, layer 1 spit 4: rim, form uncertain, single-notch lip.
(*j*) FSZ 17/98, layer 1 spit 4: rim, form uncertain, plain.
(*k*) FSZ 17/98, layer 1 spit 4: body, dentate-stamp.
(*l*) FSZ 17/98, layer 1 spit 4: body, dentate-stamp.
(*m*) FSZ 17/98, layer 1 spit 4: body, dentate-stamp.
(*n*) FSZ 17/98, layer 1 spit 4: body, incision.
(*o*) FSZ 17/98, layer 1 spit 4: shoulder, fingernail impression.
(*p*) FSZ 17/98, layer 1 spit 4: shoulder, red slip, two notched applied relief bands, dentate-stamp; form uncertain, but reminiscent of a cylinder stand.
(*q*) FSZ 17/98, layer 1 spit 4: body, incision or plain stamp.
(*r*) FSZ 17/98, layer 1 spit 4: body, shell impression.
(*s*) FSZ 17/98, layer 1 spit 5: rim, form uncertain, dentate-stamp.
(*t*) FSZ 17/98, layer 1 spit 5: body, incision or plain stamp.
(*u*) FSZ 17/98, layer 1 spit 5: shoulder, plain.
(*v*) FSZ 17/98, layer 1 spit 6: body, dentate-stamp, circle impression.
(*w*) FSZ 17/98, layer 1 spit 6: body, red slip, dentate-stamp.
(*x*) FSZ 17/100, layer 1 spit 1: rim, form uncertain, single-notch lip.
(*y*) FSZ 17/100, layer 1 spit 1: rim, form uncertain, single-notch lip.
(*z*) FSZ 17/100, layer 1 spit 1: rim, form uncertain, single-notch lip.
(*aa*) FSZ 17/100, layer 1 spit 1: rim, form I, dentate-stamp, circle impression.
(*ab*) FSZ 17/100, layer 1 spit 1: body, incision and plain stamp.
(*ac*) FSZ 17/100, layer 1 spit 1–2: body, incision and plain stamp.
(*ad*) FSZ 17/100, layer 1 spit 1: body, dentate-stamp, circle impression.
(*ae*) FSZ 17/100, layer 1 spit 1: body, shell impression.
(*af*) FSZ 17/100, layer 1 spit 1–2: shoulder, dentate-stamp; the stippled area is a painted band of red pigment or slip.

Figure 13. Excavated sherds from FSZ.

(*a*) FSZ 12/92, layer 1 spit 1, sherd 573: rim, form uncertain, dentate-stamp.
(*b*) FSZ 12/92, layer 1 spit 2, sherd 637: body, plain stamp, circle impression.
(*c*) FSZ 12/92, layer 1 spit 3, sherd 749: rim, form uncertain, dentate-stamp, single-notch lip.
(*d*) FSZ 12/92, layer 1 spit 3, sherd 748: body, incision.
(*e*) FSZ 12/94, layer 1 spit 2, sherd 332: body, dentate-stamp.
(*f*) FSZ 12/95, layer 1 spit 1, sherd 9: body, dentate-stamp.
(*g*) FSZ 12/95, layer 1 spit 2, sherd 116: rim, form uncertain, plain.
(*h*) FSZ 12/95, layer 1 spit 2, sherd 111: body, incised, plain stamp.
(*i*) FSZ 12/95, layer 1 spit 3, sherd 202: body, dentate-stamp.
(*j*) FSZ 13/93, layer 1 spit 2, sherd 1273: body, incision.
(*k*) FSZ 13/93, layer 1 spit 2, sherd 1274: body, incision.
(*l*) FSZ 13/95, layer 1 spit 1, sherd 800: shoulder, dentate-stamp.
(*m*) FSZ 13/95, layer 1 spit 1, sherd 799: body, dentate-stamp.
(*n*) FSZ 13/95, layer 1 spit 1, sherd 802: body, incision.
(*o*) FSZ 13/95, layer 1 spit 3, sherd 1042: body, dentate-stamp.
(*p*) FSZ 14/93, layer 1 spit 1, sherd 2098: body, incision.

(*q*) FSZ 14/93, layer 1 spit 2, sherd 2167: body, incision and/or plain stamp.
(*r*) FSZ 14/94, layer 1 spit 2, sherd 1959: shoulder, dentate-stamp.
(*s*) FSZ 14/94, layer 1 spit 2, sherd 1953: body, incision, plain stamp.
(*t*) FSZ 14/94, layer 1 spit 2, sherd 1958: body, incision.
(*u*) FSZ 14/94, layer 1 spit 3, sherd 2033: rim, form uncertain, dentate-stamp on exterior and interior.
(*v*) FSZ 14/95, layer 1 spit 1, sherd 1614: shoulder, dentate-stamp, circle impression.
(*w*) FSZ 14/95, layer 1 spit 2, sherd 1774: body, dentate-stamp.
(*x*) FSZ 14/95, layer 1 spit 3, sherd 1875: rim, form uncertain, heavily abraded but with traces of decoration on the lip and vessel exterior.
(*y*) FSZ 14/95, layer 1 spit 1, sherd 1616: body, dentate-stamp; probably same vessel as sherd 2513 from 15/95 layer 1 spit 1 (Fig. 13ak).
(*z*) FSZ 15/92, layer 1 spit 3, sherd 3251: body, dentate-stamp, circle impression.
(*aa*) FSZ 15/92, layer 1 spit 3, sherd 3257: rim, form uncertain, single-notch lip.
(*ab*) FSZ 15/93, layer 1 spit 2, sherd 3047: possibly flat base of form I or a carinated shoulder, incision.
(*ac*) FSZ 15/93, layer 1 spit 2, sherd 3054: shoulder, dentate-stamp, incision.
(*ad*) FSZ 15/94, layer 1 spit 1, sherd 2769: body, incision.
(*ae*) FSZ 15/94, layer 1 spit 2, sherd 2766: body, incision.
(*af*) FSZ 15/95, layer 1 spit 1, sherd 2510: body, shell impression.
(*ag*) FSZ 15/95, layer 1 spit 1, sherd 2499: rim, form uncertain, single-notch lip.
(*ah*) FSZ 15/95, layer 1 spit 1, sherd 2508: rim, form VII, single-notch lip.
(*ai*) FSZ 15/95, layer 1 spit 1, sherds 2505/2507: body, dentate-stamp (single sherd broken after excavation).
(*aj*) FSZ 15/95, layer 1 spit 1, sherd 2502: rebated shoulder.
(*ak*) FSZ 15/95, layer 1 spit 1, sherd 2513: body, dentate-stamp; probably from the same vessel as sherd 1616 (Fig. 13y) from the adjacent square FSZ 14/95, layer 1 spit 1.

Figure 14. Surface and excavated sherds from FXO, FYS, FAAI, FAAJ and FAAL.
(*a*) FXO, surface: rim, form VI, single-notch lip.
(*b*) FXO, surface: rim, form VI, plain.
(*c*) FXO, surface: rim, form V, mouth diameter 140–180 mm, plain.
(*d*) FXO, surface: rim, form V or VI, single-notch lip.
(*e*) FXO, surface: rim, form uncertain, double-notch lip.
(*f*) FXO, surface: rim, form uncertain, mouth diameter 280–300 mm, single-notch lip.
(*g*) FXO, surface: rim, form uncertain, square channel on lip, double notch, dentate-stamp, plain stamp.
(*h*) FYS TP1, “Lapita clay”: body, incision.
(*i*) FYS TP2, layer 5 spit 2: rim, form uncertain, single-notch lip.
(*j*) FYS TP2, layer 5 spit 2: rim, form uncertain (possibly VII), plain.
(*k*) FYS TP2, layer 5 spit 2: shoulder, plain.
(*l*) FYS TP2, layer 5 spit 1: shoulder, plain (NZA-3733: 3220–2850 cal. BP).
(*m*) FYS TP2, layer 5 spit 2: shoulder, plain.
(*n*) FYS TP2, layer 5 spit 2: body, incision.
(*o*) FYS TP2, layer 5 spit 3: rim, form I, dentate-stamp (Beta-72144: 3390–3080 cal. BP).
(*p*) FYS, surface: rim, form uncertain, single-notch lip.
(*q*) FYS, surface: rim, possibly form I, dentate-stamp lip.
(*r*) FYS TP2, layer 5 spit 3: body, incision (NZA-3733: 3390–3080 cal. BP).
(*s*) FAAI, pit A1, layer 4 spit 2: rebated shoulder, fingernail impression.
(*t*) FAAJ, pit 1, layer 5 spit 2: rim, form uncertain, plain (Beta-102971: 2490–2000 cal. BP).
(*u*) FAAJ, pit 1, layer 5 spit 2: rim, possibly form I, slightly channelled lip, plain (Beta-102971: 2490–2000 cal. BP).
(*v*) FAAJ, pit 1, layer 5 spit 2: body, fingernail impression (Beta-102971: 2490–2000 cal. BP).
(*w*) FAAL, surface: body, dentate-stamp.
(*x*) FAAL, surface: body, dentate-stamp.
(*y*) FAAL, surface: body/shoulder, fingernail impression.

Figure 15. Excavated sherds from FAAN and FAAQ, and unstratified sherd from Murikape.
(*a*) FAAN pit D3, layer 4 spit 2: rim, form II or VII, double-notch lip (Beta-102969: 2210–2040 cal. BP).
(*b*) FAAN pit D4, layer 4 spit 4: body, fingernail impression.
(*c*) FAAN pit D7, layer 6 spit 2: shoulder, fingernail impression, four sherds found separately and conjoined (Beta-112607: 2520–2150 cal. BP).
(*d*) FAAN pit D7, layer 6 spit 2: body, fingernail impression (Beta-112607: 2520–2150 cal. BP).
(*e*) FAAQ pit G2, layer 4 spit 1: shoulder, plain.
(*f*) FAAQ pit G2, layer 4 spit 2: rim, possibly form V, scalloped lip (Beta-112602: 1870–1590 cal. BP).
(*g*) FAAQ pit G2, layer 4 spit 3: body, incision.
(*h*) FAAQ pit G5, layer 5 spit 3: body, dentate-stamp (Beta-112598: 2620–2350 cal. BP).
(*i*) FAAQ pit G5, layer 5 spit 3: body, dentate-stamp (Beta-112598: 2620–2350 cal. BP).
(*j*) FAAQ pit G11, layer 3 spit 2: rim, form uncertain, double-notch lip (Beta-112603: 2160–1820 cal. BP).
(*k*) FAAQ pit G11, layer 3 spit 2: rim, possibly form V, single-notch lip (Beta-112603: 2160–1820 cal. BP).
(*l*) FAAQ pit G11, layer 3 spit 2: rim, form uncertain, single-notch lip (Beta-112603: 2160–1820 cal. BP).
(*m*) FAAQ pit G11, layer 3 spit 2: body, incision (Beta-112603: 2160–1820 cal. BP).
(*n*) FAAQ pit G11, layer 3 spit 2: body, incision (Beta-112603: 2160–1820 cal. BP).
(*o*) FAAQ pit G11, layer 3 spit 3: shoulder, fingernail impression.
(*p*) FAAQ pit G12, layer 2 spit 1: rim, probably form V, single-notch lip (Beta-112597: 2340–2100 cal. BP).
(*q*) FAAQ pit G12, layer 2 spit 2: body, dentate-stamp and incision.
(*r*) FAAQ pit G12, layer 2 spit 2: rim, form VII, plain, found as two pieces that join. The dotted lines along the margins indicate ground areas.
(*s*) FAAQ pit G12, layer 2 spit 2: body, incision.
(*t*) FAAQ pit G12, layer 2 spit 2: body, incision or plain stamp.
(*u*) FAAQ pit G12, layer 2 spit 2: body, incision or plain stamp.
(*v*) Murikape, from a recent grave pit: rim, form I, dentate-stamp, incision and/or plain stamp.

Fig. 4. Excavated sherds from FAO (for provenance and other details, see Appendix 3).

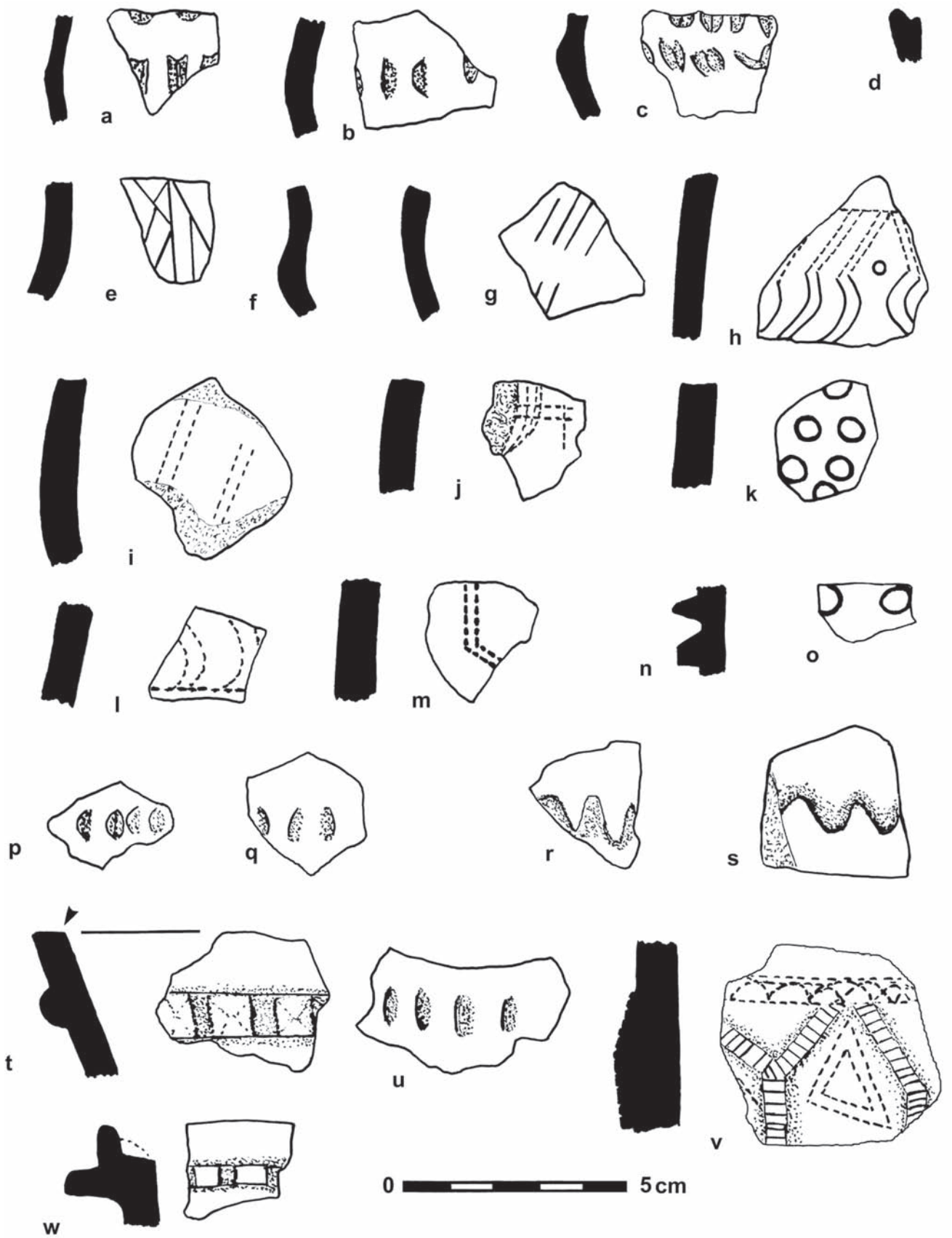

Fig. 5. Excavated (*a–h, j–k*) and surface (*i, l–w*) sherds from FAO (for provenance and other details, see Appendix 3).

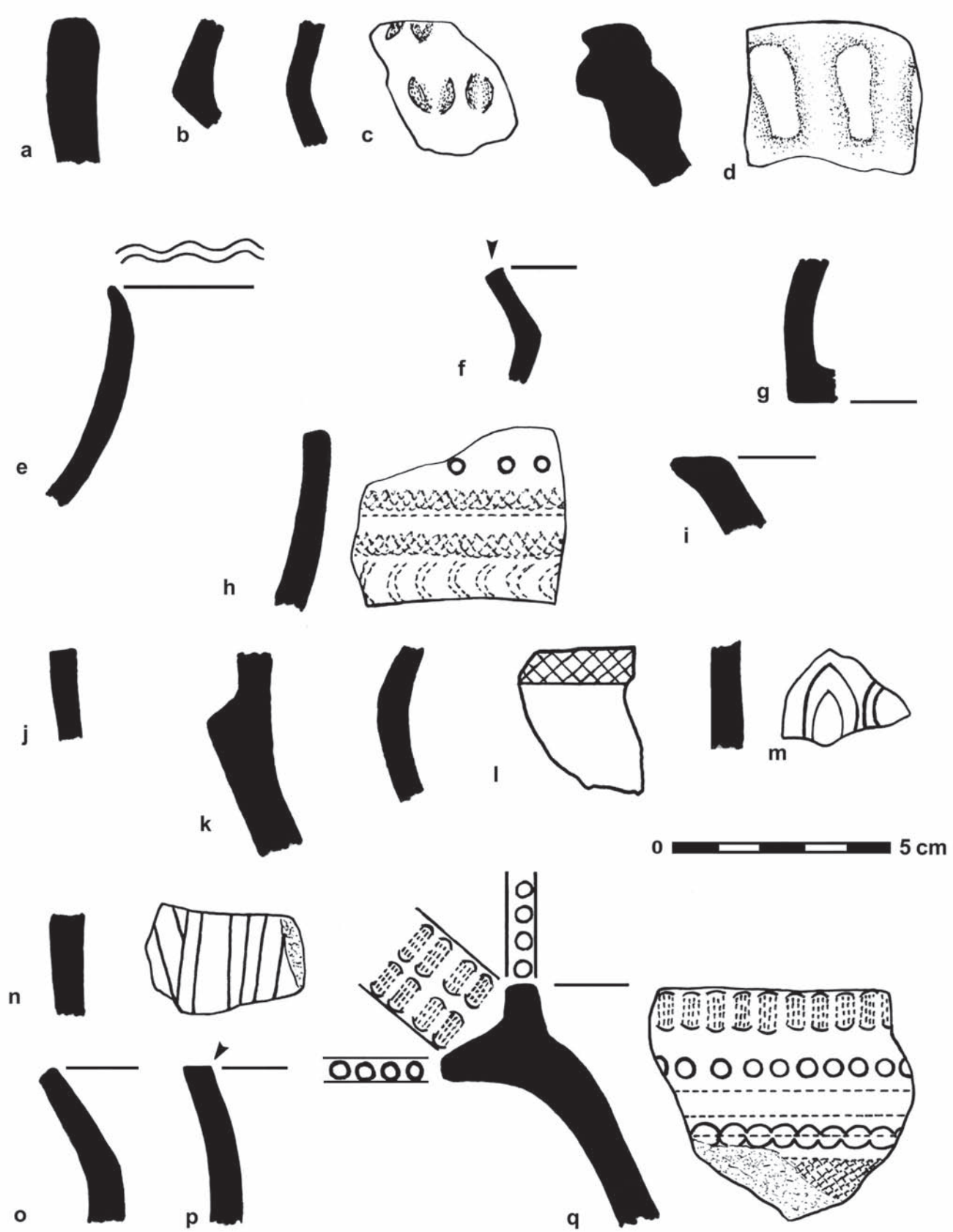

Fig. 6. Surface sherds from FAS (*a–d*), FCH (*e–h*), FCN/FCO (*i–j*), FCT (*k*), FCV/FCW (*l–n*), FCY (*o*), FDL/FDM (*p*) and FDK (*q*) (for provenance and other details, see Appendix 3).

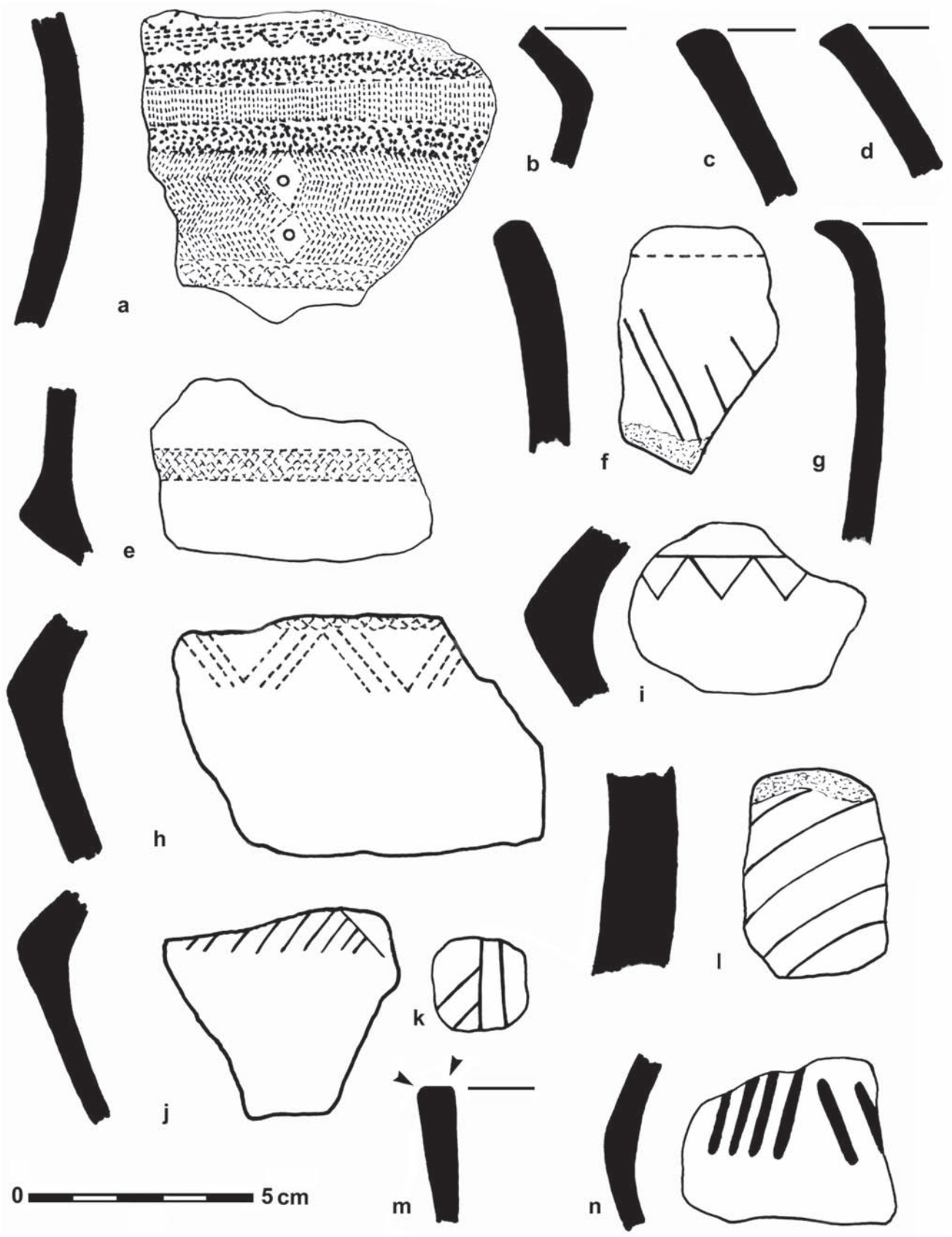

Fig. 7. Surface sherds from FEK (*a–b*) and FEM (*c–n*) (for provenance and other details, see Appendix 3).

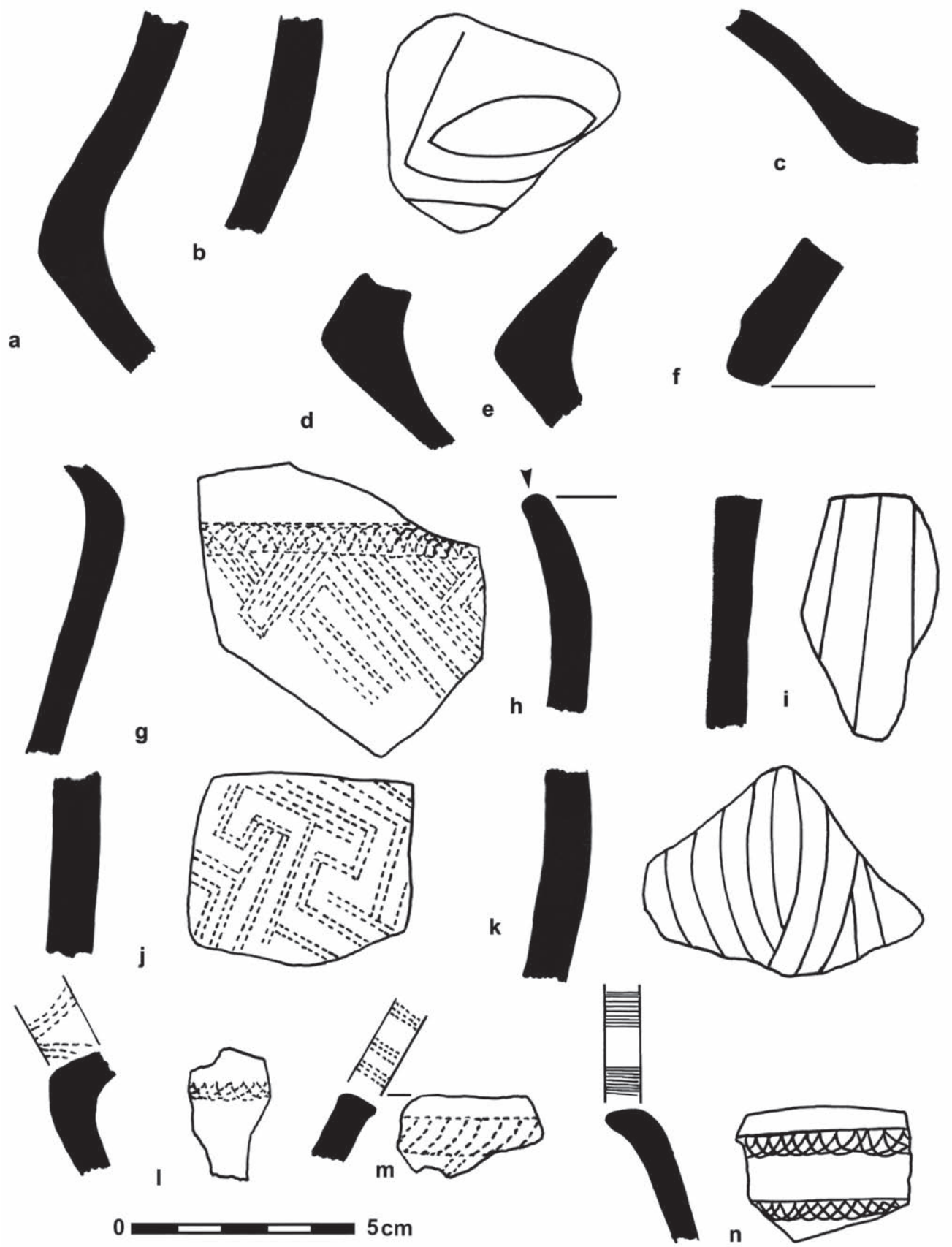

Fig. 8. Surface sherds from FEM (*a*–*e*) and FQD (*f*–*k*), and excavated sherds from FQY (*l*–*n*) (for provenance and other details, see Appendix 3).

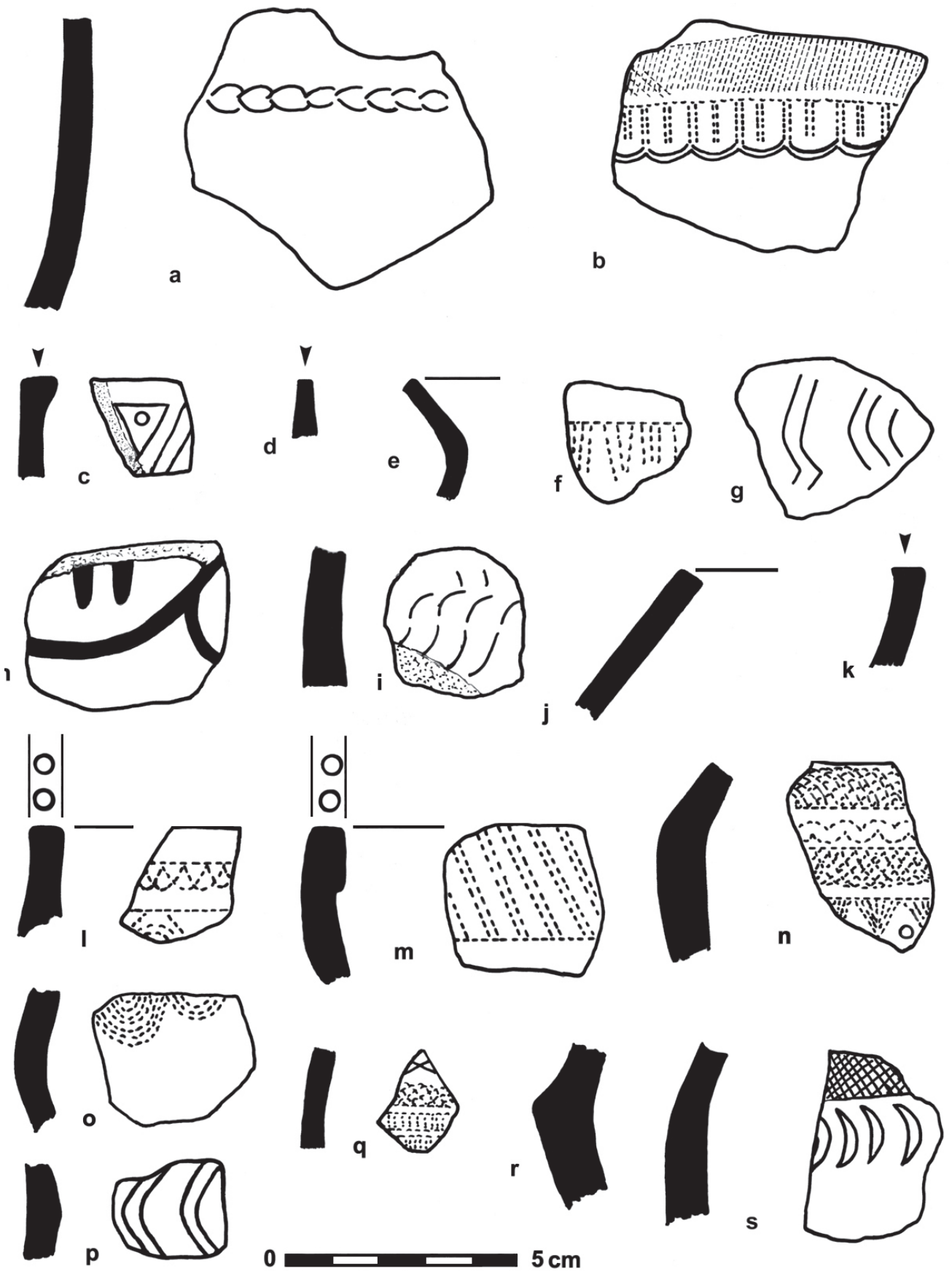

Fig. 9. Excavated sherds from FQY (*a–g*) and FRD (*k*), and surface sherds from FQY (*h*), FQZ (*i*), FRA (*j*), FRI (*l–q*) and FRJ (*r–s*) (for provenance and other details, see Appendix 3).

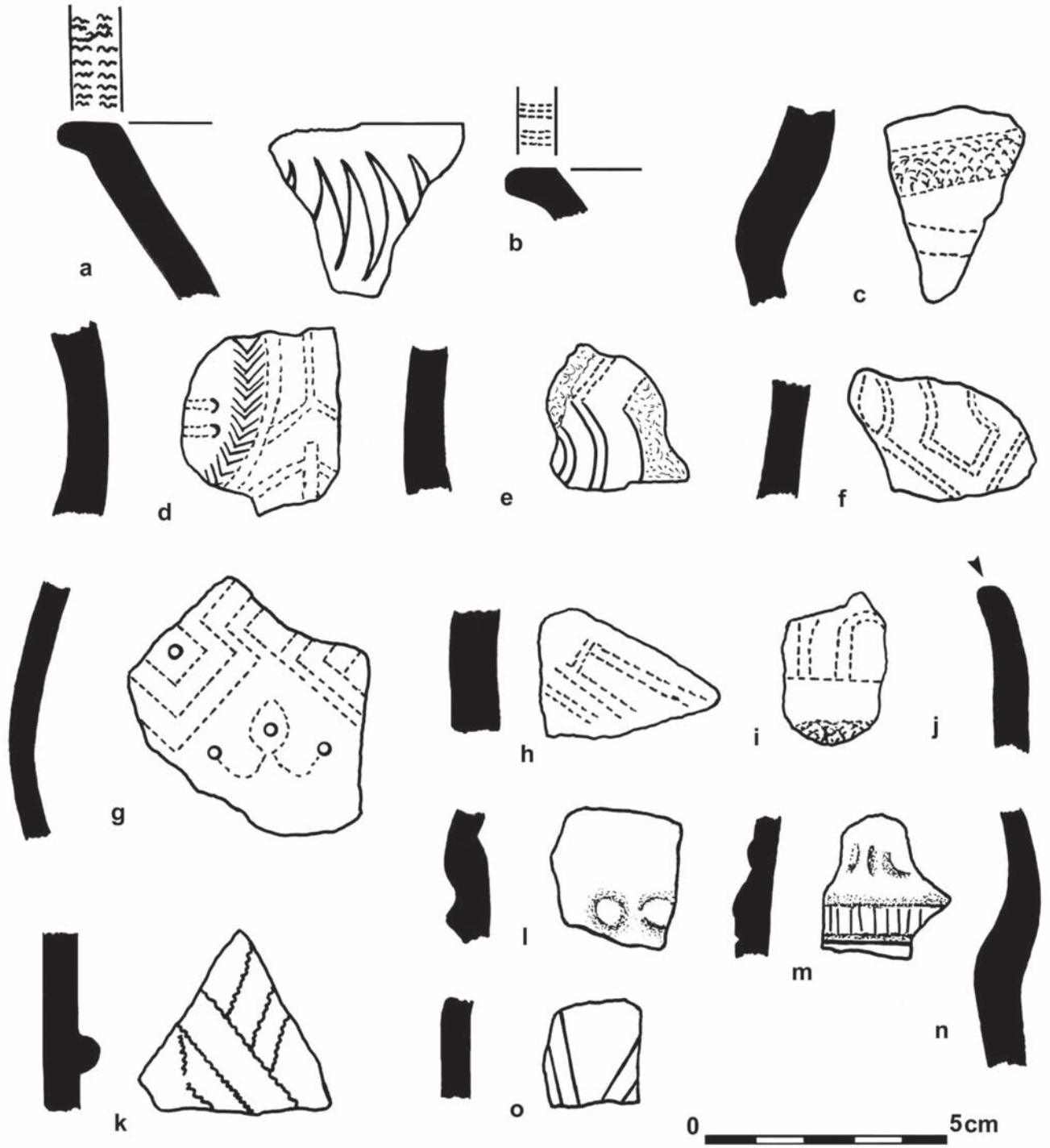

Fig. 10. Excavated (*c*, *f*) and surface (*a–b*, *d–e*, *g–o*) sherds from FSZ (for provenance and other details, see Appendix 3).

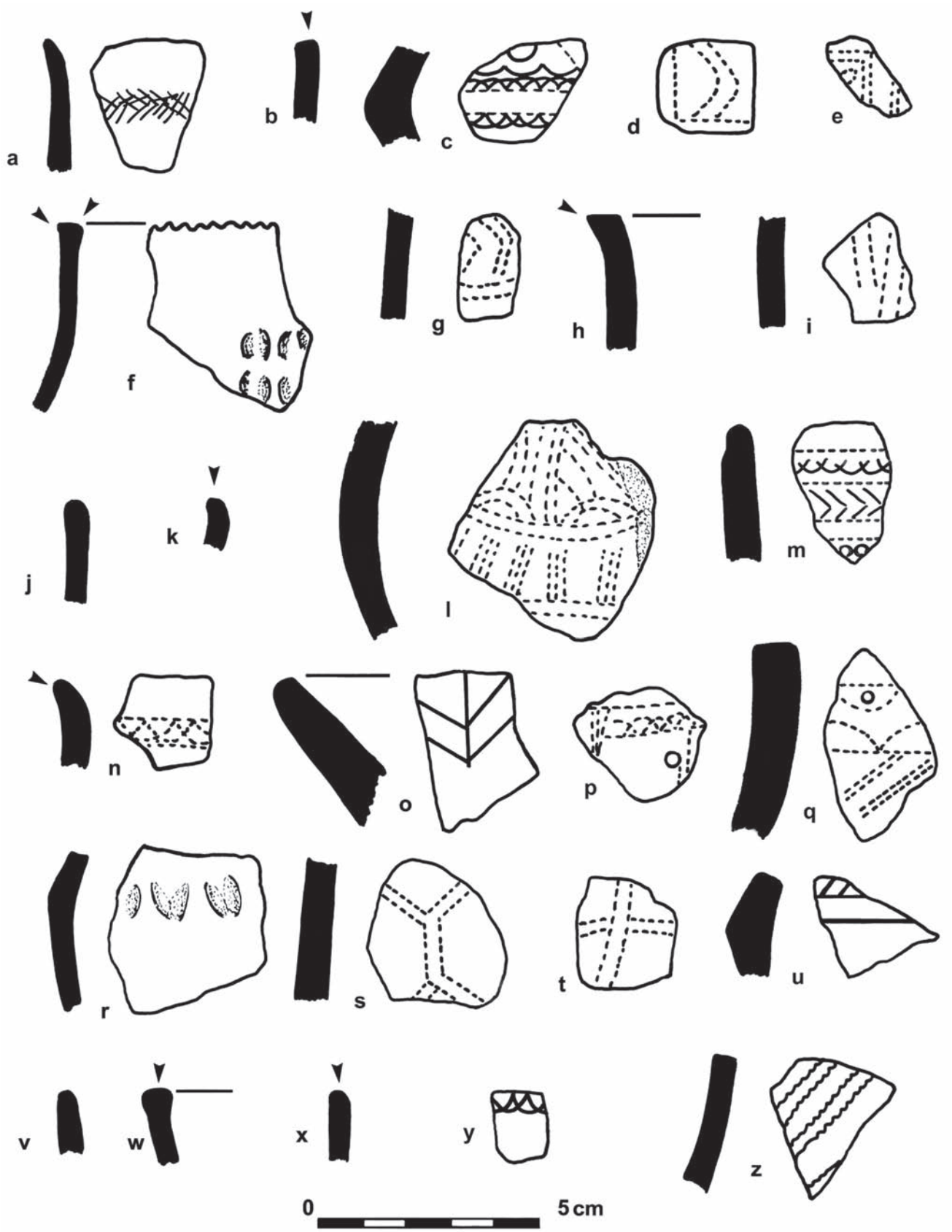

Fig. 11. Excavated sherds from FSZ (for provenance and other details, see Appendix 3).

Fig. 12. Excavated sherds from FSZ (for provenance and other details, see Appendix 3).

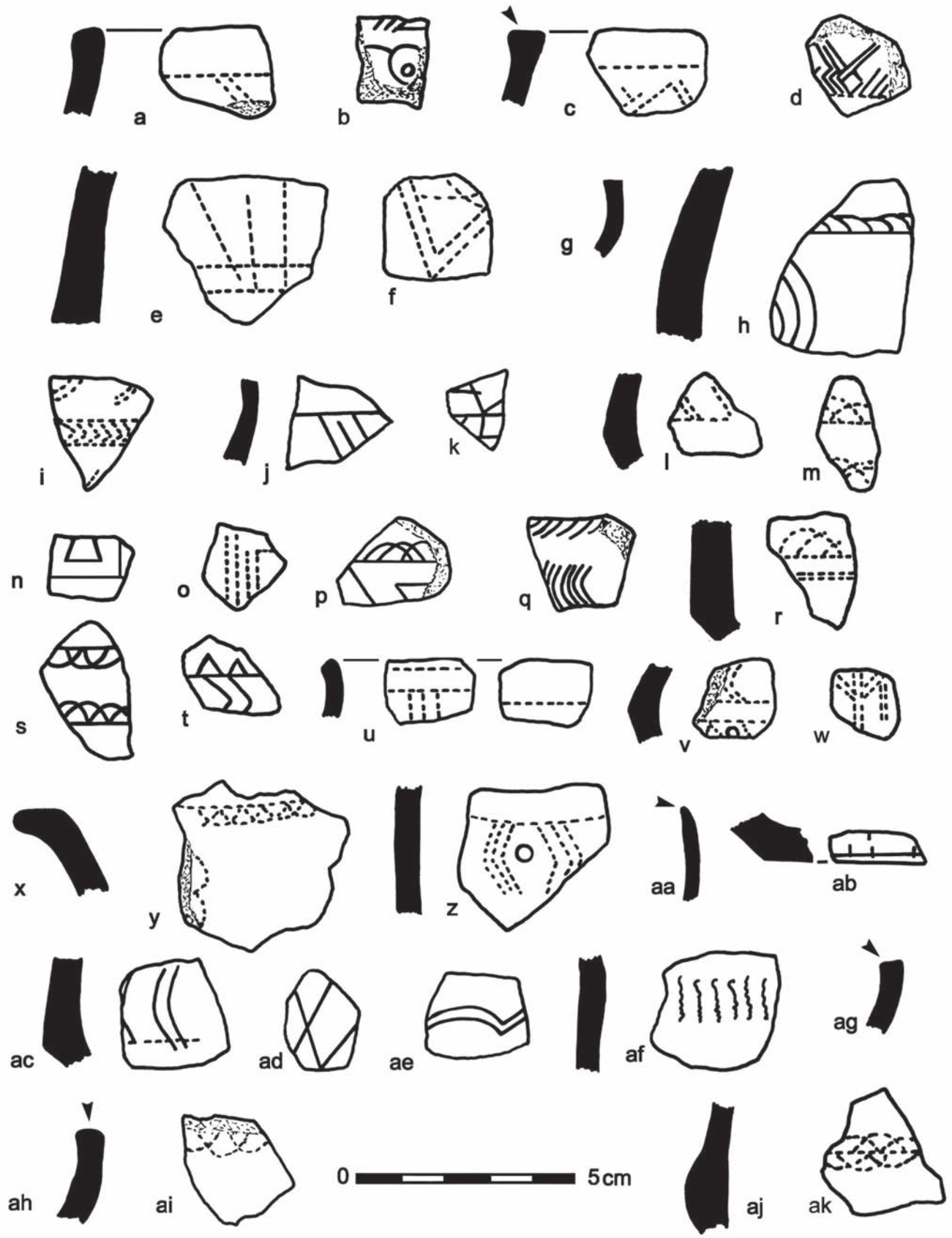

Fig. 13. Excavated sherds from FSZ (for provenance and other details, see Appendix 3).

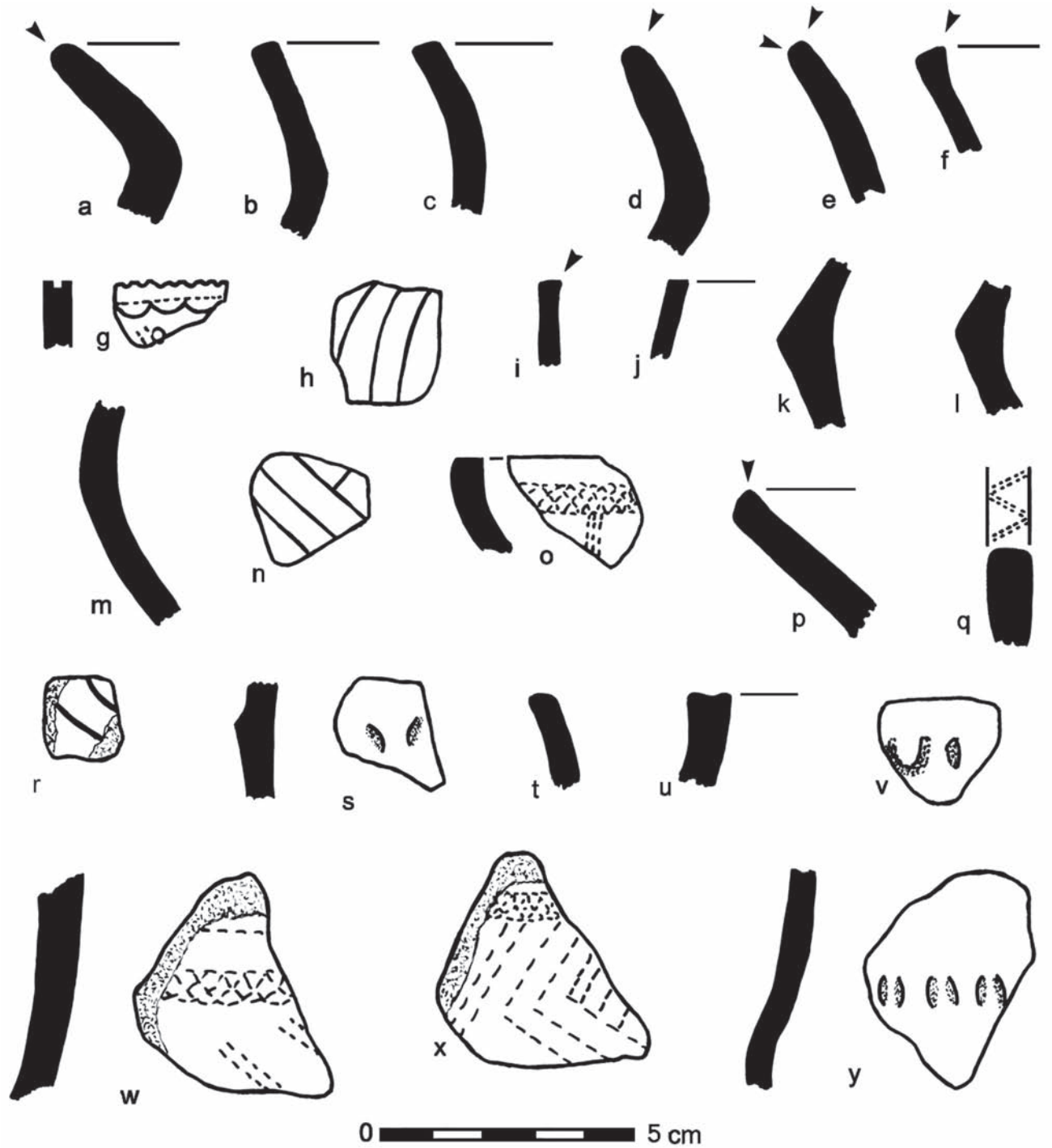

Fig. 14. Excavated sherds from FYS (*h–o, r*) and surface sherds from FXO (*a–g*), FYS (*p–q*), FAAI (s), FAAJ (*t–v*) and FAAL (*w–y*) (for provenance and other details, see Appendix 3).

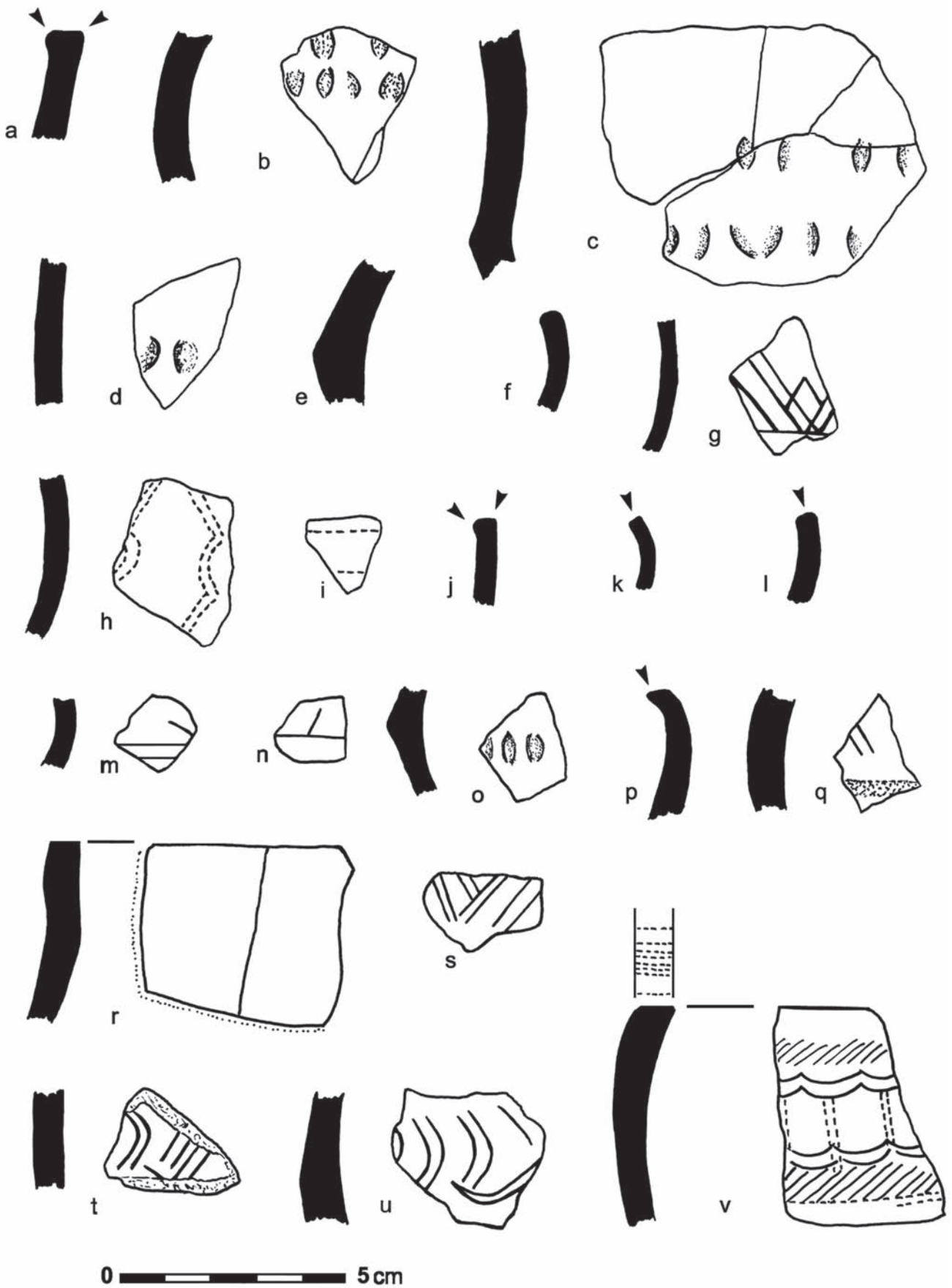

Fig. 15. Excavated sherds from FAAN (*a–d*) and FAAQ (*e–u*), and unstratified sherd (*v*) from Murikape (for provenance and other details, see Appendix 3).

Plate 1. Aerial view of the Talasea region looking north along the Willaumez Peninsula with the Dakataua caldera at the top. The buildings of Bitokara Mission (site FRL) are visible in the lower left hand corner. Langu Island (FQD) is situated in the centre of Garua Harbour, and Boduna (FEA) is the smaller island on the far right. Pangalu village is on the mainland opposite Boduna Island and Lotomgam (FACL) is on the promontory of the Peninsula just behind Pangalu. Recently emerged coral is visible to the west of Langu in Garua Harbour. Photo: J. Specht, 1989.

Plate 2. Looking east across Garua Harbour from Mt. Humgari, inland from Bamba village, showing Langu (FQD), Garua and Garala (FEM) Islands, with the volcanoes inland from Cape Hoskins in the far distance. Bamba and Talasea are on the lower (south) side of the Harbour, with the promontory of Point Mondu (FCN/FCO) clearly visible on the right hand side. Photo: J. Specht, 1974.

Plate 3. View to the southeast from Nabodu beach (FCH) at Bamba village to Garua Island in the distance. Tree roots dated to 670–420 cal. BP are visible in the foreground. Photo: J. Specht, 1974.

Plate 4. Point Mondu on the east side of Talasea Station showing the low neck of raised coral limestone on which is located FCN/FCO. The southwestern part of Garua Island is in the left background. Photo: J. Specht, 1974.

Plate 5. John Webb, La Trobe University, is pointing to oyster shells on volcanic rocks at Point Mondu. One of these shells is dated to 630±60 bp. These shells now stand about one metre above the modern oysters visible at the same level as his feet. Raised coral from another part of Point Mondu is dated to 650±60 bp. Photo: N. Baker, 1992.

Plate 6. Dead coral in Garua Harbour raised about one metre above current sea level at Bamba, west of Talasea Station. Note the vegetation colonizing the raised coral, which lacked vegetation in 1974. Photo: R. Torrence, 2002.

Plate 7. View from the beach near FSZ of the hills on which stand FAO (left) and FRD on the top of Mt. Baki (right) on Garua Island. Exposures of Baki obsidian outcrop along the shoreline below FAO. Photo: R. Torrence, 1992.

Plate 8. The FSZ site is located on a coastal hill formed by a scoria cone on the northwest side of Garua Island. The scoria cone is overlain by about 10 metres of tephras and their associated palaeosols, seen most clearly at the top right. The lower tephras are probably of Pleistocene age. The FSZ Lapita level is the palaeosol formed on the W-K2 tephra near the top of the exposure. Quarrying has removed a large portion of the site. Photo: R. Torrence, 1991.

Plate 9. Aerial view looking west towards Walindi Plantation Resort on Willaumez Peninsula. In 1988–1998, pottery was found in surface and excavated contexts (FRI) on the parallel ridges running down the forested slopes of Mt. Garbuna at the centre and right of the photo. The pottery findspots extend down the ridges from the point where the oil palm plantation (light coloured vegetation) meets the rainforest (dark coloured vegetation). The ridges terminate at the coastal plain, which was probably formed in the late Holocene. The crater of Mt Garbuna contains an extensive, solfataric geothermal area. In late 2005, there was a minor eruption in the Garbuna crater, the first in historical times. Photo: J. Specht, 1989.

Plate 10. Within the Talasea region pottery is often found within a distinctive dark soil formed on tephra from the W-K2 eruption of the Witori volcano (lower layer of light sediment). In this photo of test pit 1000/1000 at site FAO, the soil with pottery is sealed by tephra from the Dk eruption of Dakataua volcano (top layer of light sediment). In some cases, as with this section, the W-K3 tephra is also preserved as a thin layer above the dark soil in which the pottery is found. Photo: R. Torrence, 1993.

Plate 11. Stratigraphic sequence of test pit II at FRI, showing the position of the important chrono-stratigraphic layers W-K3 tephra (upper light layer, where it is mixed with W-K4 tephra) and W-K2 tephra (lower light layer). Photo: J. Specht, 1989.

Plate 12. Raised coral terrace exposed on the beach at FYS on the south side of Garua Island. Excavation on the terrace just inland from this location revealed a dentate-stamped sherd dated to 3390–3080 cal. BP in a palaeosol formed on the W-K2 tephra, which was directly on top of the coral layer. Pottery on the beach suggests that part of the site has probably been eroded by wave action. Photo: R. Torrence, 1993.

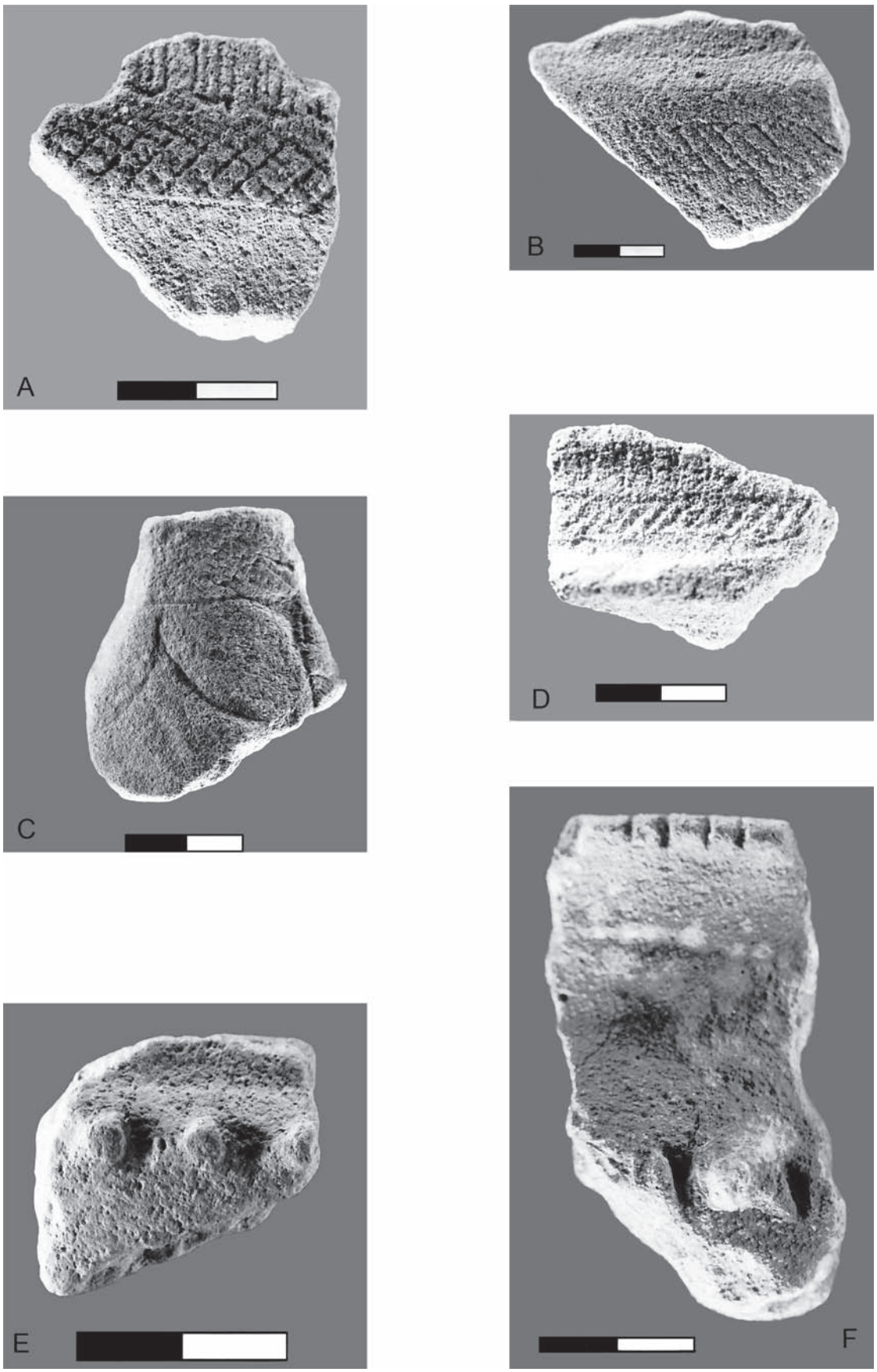

Plate 13. Surface sherds from the re-deposited site FEL. (*a*) dentate-stamped body; (*b*) and (*d*) dentate-stamped shoulders; (*c*) deeply incised or gouged rim or pedestal base; (*e*) shoulder with relief knobs; (*f*) rim with single-notched lip and notched relief band. Photos: Georgia Britton.