WHAT WAS THE SIGNIFICANCE OF LAPITA POTTERY AT TALASEA?

Jim Specht, Richard Fullagar and Robin Torrence*

Lapita pottery appears in the Bismarck Archipelago of Papua New Guinea around 3500 years ago (Kirch and Hunt 1988), about 30,000 years after the first evidence for the human settlement of the region (Allen *et al.* 1989). The pre-Lapita occupation of these islands has been long recognised (Downie and White 1978; Specht *et al.* 1981; White and Allen 1980; Allen and White 1989), though is largely known only from cave and rock shelter sites. Study of the relationship between the introduction of the pottery and any prior populations in the area has been hampered by a paucity of open sites with long sequences bridging the pre-Lapita, Lapita and post-Lapita phases. Our recent research in the Talasea area of West New Britain Province has located several such sites that allow us to begin to examine the relationships between these phases. In this paper we present some preliminary results of this research. We argue that current models underestimate the diversity of expression of Lapita in this region and raise the possibility that not all of the Talasea sites with Lapita pottery were part of the "Lapita cultural complex" (Green 1979, and this volume). Finally, we query whether the appearance of the pottery marked major changes in human use of the area.

There are two main models about the genesis and development of Lapita pottery or the Lapita cultural complex within the Bismarck Archipelago. The first views Lapita as intrusive, perhaps brought into the region fully-fledged, possibly by a "new" people who introduced many new cultural features to the region. This so-called "fast train" model reflects past concerns with Polynesian origins in which the Bismarck Archipelago was seen essentially as a corridor for getting people into Polynesia (cf. Allen and White 1989:131, 141). The other model, sometimes called the "gradualist" position, views the Archipelago as having a prehistory in its own right (Allen and White 1989:141) and acknowledges the likely contribution of pre-Lapita populations to the development of the Lapita cultural complex. It places emphasis on the emergence of new cultural features within the region.

For the post-Lapita phase, Spriggs (1984; see also this volume) has suggested that in some areas of Near Oceania (Green in press) with non-Lapita pottery, there might have been a basic continuity between Lapita and later "cultures", using Western Polynesia as his model. The question of what happened after Lapita pottery disappeared from the

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* Australian Museum, PO Box A285, Sydney South, NSW 2000, Australia

Bismarck Archipelago has received little attention to date. What is needed now is a comparative study of the pre-Lapita, Lapita and post-Lapita sequences in local contexts (cf. Ambrose 1988; Gosden 1989; Gosden *et al.* 1989; Kennedy 1983; White and Downie 1983).

To date, 17 sites with levels pre-dating Lapita have been identified in the Archipelago: two open and one cave site on Manus (Kennedy 1983; Spriggs *et al.* 1990), five cave/shelter sites on New Ireland (Downie and White 1978; Allen *et al.* 1989), and two cave and seven open sites in West New Britain (Specht *et al.* 1981; Gosden 1989; Torrence *et al.* 1990). In the north Solomons two cave sites on Buka Island (Wickler and Spriggs 1988) and three rock shelters on Nissan Island (Gosden *et al.* 1989:580-81) also have pre-Lapita occupations. Lapita pottery is found at more than 40 localities in the Archipelago and the north Solomons (Gosden *et al.* 1989; Kennedy 1981; Lilley 1986, 1986- 87; H. McEldowney pers. comm.; Specht 1974; Torrence *et al.* 1990). At only five of these is pottery stratified above pre-Lapita levels. Several other sites bridge this period while lacking the distinctive pottery (eg. Lossu: White and Downie 1983; Lasigi: Gosden *et al.* 1989:580; Manus: Ambrose 1988; Gosden *et al.* 1989:578). In the Talasea area the pottery occurs at two open sites stratified above pre-Lapita levels at Walindi and on Garua Island (Torrence *et al.* 1990). The post-Lapita phase is currently poorly-defined throughout the Archipelago, though hundred of sites of this period are on record in the Papua New Guinea National Ancestral and Archaeological Sites File. Five open sites with post-Lapita materials stratified above the earlier phases are known from the Talasea area.

The Talasea area thus provides a context within which we can begin to consider cultural relationships between the three phases from before to after Lapita. We discuss our data in terms of a simplified five-stage areal sequence based on sediment deposition or formation. Two distinctive marker beds of airfall volcanic ash (tephra) facilitate stratigraphic correlations between sites at Bitokara Mission (FRL), on Garua Island (FAO, FAP, FAQ, and FRF), and at Walindi Plantation (FRI) located 25km south from Talasea (Fig. 1). These horizons are:

a) A basal stiff, red-brown clay that probably dates from the late Pleistocene through to the mid-Holocene. At site FRL this clay extends down for more than one metre and contains obsidian tools in its upper 70 cm, with stemmed (or tanged) tools common in the upper 50 cm.

b) This is overlain by a buff-grey pumiceous tephra of varying thickness but never less than 30 cm. Dated at site FRL to somewhat later than 3370±100 years bp (SUA-2814: cal. 3630 years BP), this represents a major volcanic event at Mt Witori on the Hoskins Peninsula, about 80 km south-east of Talasea, which devastated a large part of central West New Britain (cf. Blake 1976, Blake and McDougall 1973).

c) On the weathered surface of this tephra is a palaeosol that always includes obsidian tools and, at sites FAO and FRI, pottery identifiable with the Lapita series. At FRI

charcoal and *Canarium* nutshell fragments have been dated to 2000±60 years bp (Beta-34208: cal. 1950 years BP). These came from an earth-oven representing a late stage of site use before abandonment at some time prior to the emplacement of the next sediment.

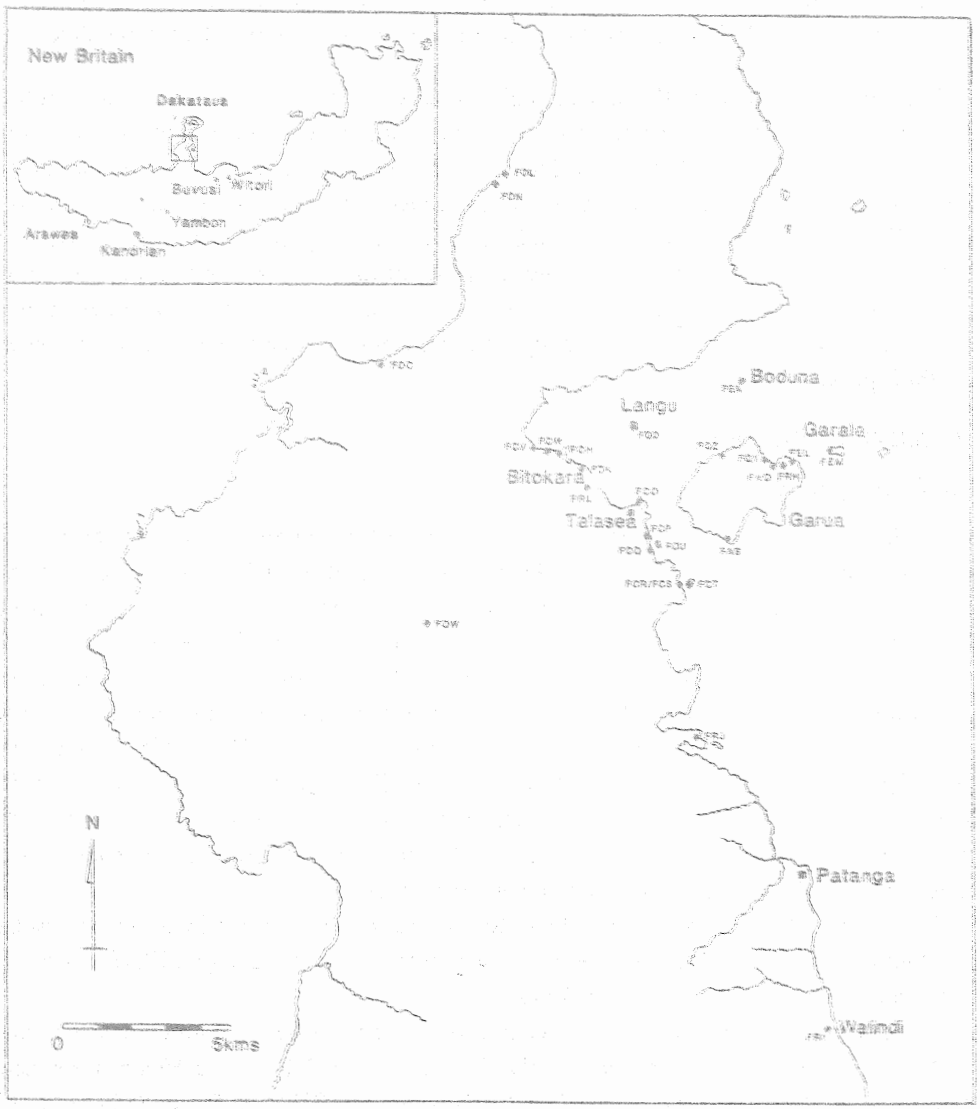

FIGURE 1: SITES OF THE TALASEA REGION

d) Overlying this palaeosol is a yellow to purplish-brown tephra of varying thickness. This probably derives from a volcanic event at about 1000-1400 years BP at Dakataua north of Talasea (R. Blong pers. comm.; cf. Branch 1967).

e) The weathered surface of this tephra represents a further soil formation phase leading to the present ground surface. This contains obsidian artefacts but pottery occurs at only three sites. In its upper section this horizon contains items of European date.

We consider changes in the archaeological records of the Talasea sites in terms of four aspects of human behaviour: settlement location, stone technology, pottery production and subsistence. We seek to identify changes in these four aspects between the three main artefact-bearing horizons, represented by sediments a) pre-Lapita period: before *c.*3600 years BP, c) Lapita period: *c.*3600 to 2000 years BP, and e) post-Lapita: after *c.*2000 years BP. We interpret these in terms of the likely significance of the appearance of Lapita pottery in the Talasea area. We do not discuss change or persistence in other artefact suites (e.g. shell and ground-stone tools) simply because we have very little or no record for their presence.

SETTLEMENT LOCATION

Pre-Lapita period

At each pre-Lapita locality there is ample evidence for human presence in the form of obsidian working (to be discussed in the next section). Here it is sufficient to note that each site is situated on ridge- or hill-tops. None is more than a kilometre from the current seashore, and there is no evidence to suggest that they were ever further away. Indeed, at Walindi the shoreline was probably once closer to the ridge on which the site stands than it is today, since the coastal flat seems to be largely composed of sediments derived from the Witori and later volcanic events. Sites FAO, FAP, FAQ and FRF on Garua Island and site FRL at Bitokara Mission (Specht *et al.* 1988; Torrence *et al.* 1990) are only a few minutes walk down the hillside to the sea. It is noteworthy, however, that sites of this period are located on islands as well as on the mainland. At Bitokara Mission and on Garua Island, the sites are adjacent to obsidian sources.

No beach-side sites can be directly dated to this period, though in terms of obsidian artefact associations, there are several that are probably of this age (eg. FCH and several other localities near Bamba village, Talasea).

In contrast, a pre-Lapita site in a red-brown clay sealed beneath an extensive pumice bed and exposed in a road-cutting on the Buvusi road (FRK) on the Hoskins Peninsula (about 60 km from Talasea) is dated 7780±250 years bp (SUA-2815: cal. 8549 years BP). This deposit, which has yielded only a few flakes of obsidian, is the only confirmed pre-Lapita site on New Britain, other than Misisil cave (FHC) and Yambon village (FGT), that is more than one kilometre inland (Specht *et al.* 1981).

This evidence suggests that prior to the Witori volcanic event people were widely distributed across the landscape in a range of topographic contexts on both beachside and ridge- or hill-top locations on both the mainland and neighbouring islands.

Lapita period

Pottery is found at 25 locations around Talasea, including both mainland and island situations. Only eight of the beachside pottery sites have yielded definite Lapita pottery, and only two of these (Boduna: FEA, and Lagenda: FCR/FCS) have pottery in any quantity. The other 12 sites have only plain, usually heavily- weathered, sherds that cannot be positively ascribed to the Lapita series, but neither can the pottery be assigned to another industry of equivalent or later date. Given the similarities of clay/filler compositions between these sites, we tentatively group them all within the Lapita series.

Where there is a pre-Witori occupation on ridge- and hill-tops, the location was also used after the tephra of horizon b) was deposited. At FRI at Walindi and FAO on Garua Island, where Lapita pottery is present, both sites stand 40 m or more above sea level on ridge tops. An unconfirmed report of Lapita pottery at Patanga village, between Walindi and Talasea, suggests that there, too, Lapita pottery has been found on a ridge-top. At some beach-side sites there is no evidence of use of the location prior to the appearance of Lapita pottery. This may reflect the time at which the beach flats were formed, for in the Arawe Islands on the south coast of New Britain Gosden (1989: 55) has noted that the coral was still developing around 5000 years ago, and was probably not uplifted to form platforms suitable for occupation until just before Lapita times. Although we do not have dates for the uplift of coral platforms around Talasea, seven of the definite Lapita sites around Talasea are located on such platforms (FRJ at Pasiloke, FCH at Lagenda, FCO at Point Mondu, FEM on Garala Island, FEL on Garua Island, FEA on Boduna Island and FQD on Langu Island). The other pottery findspots are on beaches derived from volcanic sands and other weathering products.

Thus, while there was continuity with previous settlement locations, the appearance of Lapita pottery seems to mark an expansion to previously unused land, some of which may not have existed much prior to that time. This, in turn, draws attention to the fact that around Talasea wherever there is a raised coral platform, pottery always seems to be present.

There is, then, no evidence at this stage to argue for a major re-orientation of site location following the Witori event and the introduction of pottery to the area, seemingly only an expansion to take advantage of newly-formed land. This reflects a change of degree rather than of kind, for both before and after the Witori eruption, people were using ridge- and hill-tops and, probably, beach-side locations, though not necessarily on uplifted coral platforms.

Post-Lapita period

Hundreds of sites later than Lapita pottery occur either within the upper soil formed on the second major tephra deposit or as surface scatters of artefacts. At most beach-side

locations crab-burrowing, erosion and recent human disturbances often make it impossible to attribute artefacts to this period. At the six localities where we have the complete sediment profile summarised above, including the two Lapita sites, there is always occupation evidence in this uppermost horizon. On the other hand, there are several Lapita sites for which evidence of post-Lapita occupation is either absent or equivocal. At this stage we are unable to define whether this reflects subsequent sediment erosion, disturbance, or a genuine absence.

As might be expected, many of the surface sites are locally identified as settlements ancestral to the present-day villages of the area. This association and their surface visibility almost certainly account for their higher numbers than earlier sites. Their locations are often on ridge- or hill-tops, occasionally - but not always - several kilometres inland, though some beachside settlements such as Bamba, Pangalu and Voganakai feature in oral historical accounts. These accounts (Kroll 1938; Specht 1980, 1981) attribute the foundation of the current settlement pattern to a relatively late stage of the history of the Bakovi people who inhabit the area.

The only pottery attributable to this period consists of three finds at sites at one or more kilometres inland. At two of these locations we have not conducted excavations and; therefore, have no information about their earlier use.

To summarise, at this stage the site location data do not indicate any major differences between the three main periods. The appearance of Lapita did not signal the first use of beachside or island locations. Any differences might be viewed as shifts of degree rather than of kind, though there is the possibility that this picture is an artefact of exploratory work. Talasea, however, does not offer a dramatic change in settlement pattern with the appearance of Lapita pottery as has been claimed elsewhere (eg. Arawe Islands), or for a concentration of Lapita pottery sites in very specific locations (cf. Lepofsky 1988).

STONE TECHNOLOGY

Pre-Lapita period

The pre-Witori event levels at Bitokara and other locations provide evidence for stone technology over at least several millennia. The earliest levels at Walindi and on Garua Island, as well as the roadside exposure on the Buvusi road, contain small amounts of amorphous obsidian flakes. In the lowest levels of Bitokara the technology was directed towards the production of stemmed tools of varying sizes and forms. The obsidian scree slopes exposed by road cuttings above Bitokara Mission and the trench at Bitokara suggest that large flakes from prepared cores were produced near obsidian outcrops on the slopes, and were then brought down to where the mission now stands to be finished as stemmed tools. Towards the end of the pre-Witori period at Bitokara, there is an increase in the proportion of flaking directed to the production of expedient flakes from amorphous cores.

The distribution of stemmed tools around Talasea generally coincides with the occurrence of obsidian outcrops on both the mainland and the islands, including beachside locations. Some of these are surface scatters on beaches where they have been

exposed by the eroding action of the sea (e.g. at FCH near Bamba village). Although these localities are unstratified, the nature of the stemmed tools suggests they are of the same age as the Bitokara FRL stemmed tool horizon. At several places at FAP in Malaiol stream on Garua Island, stemmed tools are stratified in pre-Witori levels, and associated debitage indicates that they were produced there.

Lapita period

Following the Witori event, stemmed tools continued, but are represented by fewer, smaller specimens at FRI at Walindi, at FEA on Boduna Island (Gosden *et al.* 1989: 583) and in re-deposited sediments at FEL on Garua Island. At Bitokara, only the expedient production of flake tools from unprepared cores is represented (Fullagar 1990a; cf. also Goulding 1987 for Boduna).

Post-Lapita period

In the latest period there are no stemmed or other formal tools and obsidian reduction is essentially expedient.

The study of obsidian reduction thus indicates the development of stemmed forms prior to the appearance of Lapita pottery. Use-wear and residue studies of these tools suggest that they were not function-specific. Prior to the emplacement of the Witori tephra, these forms decline in frequency. The appearance of Lapita pottery does not coincide with the end of stemmed tool production, although the stemmed tools dated to the Lapita period differ in size and form from the earlier tools. In post-Lapita times there was production of expedient tools only.

POTTERY

Pre-Lapita period

There is no evidence for pottery before the Witori event.

Lapita period

Following the Witori event, Lapita pottery appears on Garua, Boduna, Garala and Langu Islands, and on at least eight mainland sites as far south as Walindi. At another eleven sites the pottery is too weathered to assign with complete certainty to the Lapita series, but since it cannot be assigned to any other tradition, it is treated here as probably of Lapita origin. The Lapita pottery spans the period from about 3130±90 years bp (ANU-5073: cal. 2890 years BP) to about 2050±90 years bp (ANU-5071: cal. 1600 years BP) on Boduna Island (Gosden *et al.* 1989:567), and to 2000±60 years bp (Beta-34208: cal. 1950 years BP) at Walindi. Earlier dates are possible, since Anson's proposed "Far Western Lapita" at the Lagenda site could be much older than that of Boduna (Anson 1983, 1986).

The Lapita pottery sites fall into two groups. The Boduna Island (FEA) and Lagenda (FCR/FCS) sites stand apart from all others in the area. The Lagenda site has been destroyed by the excavation of the underlying coral platform for road surfacing material,

but surface collections have yielded hundreds of sherds. Several thousand sherds have been recovered from two test pits at FEA on Boduna (cf. Gosden *et al.* 1989:583). None of the other sites appears to have so much pottery; indeed, most have yielded less than ten sherds each, though all are known solely from surface collections. This distinction raises an important question about the presence of pottery at so many sites around Talasea. Does the variation in richness reflect functional or other differences between sites? It is possible that the very rich sites of Boduna and Lagenda represent major settlements and/or pottery production centres, whereas those with only a few sherds may have been hamlets or locations for some kind of activity other than habitation that imported pottery from them.

Geochemical analyses of selected Lagenda sherds by Anson (1983) suggest that the pottery at Lagenda was produced locally, a view supported by petrological examination of volcaniclastic sand tempers in sherds from Lagenda and other Talasea sites by Dr Julian Hollis (pers. comm.). While these limited compositional analyses do not allow us to pinpoint specific production localities at this stage, they have not identified any sherds likely to have originated beyond the Talasea area. It seems that all of the Talasea Lapita pottery was produced within the area, though the location of the production centre(s) is not yet known. Boduna Island is an unlikely candidate, since it is a small coralline formation without naturally-occurring clay deposits. Pottery could only have been produced there from clay and volcaniclastic sands for temper imported from the mainland or from Garua Island. Small chips of obsidian in 12 Boduna sherds indicate that they were most likely made around Talasea, and element analysis by the PIXE technique suggests that at least one of these chips probably originated from a mainland source in the Voganakai area (Summerhayes *et al.* 1991).

Xero-radiographic images of more than one thousand sherds from the Talasea area suggest several major composition groups. At no site with more than ten or so sherds, such as Boduna or Lagenda, are the sherds of one group only. This may indicate that none of these sites was a production centre, unless several clay/filler mixes were in use at the same time. Given the long duration of Lapita use in the Bismarck Archipelago (Kirch and Hunt 1988; cf. Green and Anson 1987), and the 1000 years range of the currently-available radiocarbon dates for the Talasea sites, the life-span of Lapita in the Talasea area could have accommodated several shifts in the location of production centres, each accompanied by a selection of differing temper styles to accommodate local clay conditions.

Some of the Lapita findspots are not associated with or even close to obsidian sources (eg. Walindi, Patanga, Pasiloke, Lagenda). We are uncertain at this stage whether this reflects differential use of the landscape by a single population, or whether it indicates the presence of two or more populations, each with its own domain (cf. Specht *et al.* 1988). We note, however, that at Bamba village and on Garua and Garala islands the Lapita sites are within a few minutes walk of obsidian sources, while other sites (eg. on Langu and Boduna Islands) are only short canoe trips to the nearest sources. The wide availability of obsidian around Talasea essentially eliminates distance as a factor in

locating settlements to facilitate access to obsidian (cf. Specht *et al.* 1988; Torrence *et al.* in press).

Post-Lapita period

With the end of Lapita there was virtually no further use of pottery in the area; only three definitely post-Lapita pottery finds have so far been recovered:

1) One sherd from the surface of the Walindi site (FRI), attributable to the recent Madang industry on mainland New Guinea.
2) One sherd from Beto (FQW) in the centre of the peninsula south of Talasea. This site is well-known among the Bakovi people of the Talasea area as an ancestral site of recent age, and its archaeological record is a result of a visit with one of our field assistants who wished to visit the place where his parents once lived. The sherd is similar to pottery from the recent Sio- Gitua industries on the New Guinea mainland.
3) One incomplete pot similar to recent Huon Gulf pottery allegedly found just below ground surface at Nahaba hamlet (FQQ), about one kilometre above Bitokara Mission.

No Type X sherds have been found, though Lilley (1988, pers. comm.) has reported this pottery type from the Siassi and Kove Islands to the west of the Willaumez Peninsula.

SUBSISTENCE

Pre-Lapita period

Subsistence data for the pre-Witori period are elusive. The stiff clays representing this period contain no macroscopic organic remains. Microscopic examination by Fullagar of residues adhering to the working edges of obsidian tools from several sites indicate the presence of starch grains, possibly from a tuberous plant such as taro or a related species, but these have yet to be identified with certainty (Fullagar 1990b, Fullagar and Bowdery 1991).

Lapita period

There is slightly more information on subsistence for the period following the Witori eruption. At the Walindi site we have recovered many charred fragments of *Canarium*, coconut and other nutshells (identified by D. Yen) dated to about 2000 years bp. The Boduna Lapita site has yielded several small unidentified bone fragments, and marine shells consistent with the island's coralline nature (eg. *Chama* sp.).

Post-Lapita period

The most recent sites again contain little evidence for subsistence activities, and these appear to be consistent with the limited data for the previous period, with the addition of pig and fish bone, and a wider range of marine molluscs.

The data provide no substantive information on subsistence history through the three periods. The plant remains from Walindi are consistent with what is known about Lapita period plant use elsewhere in the Bismarck Archipelago (eg. Kirch 1988; Gosden *et al.* 1989:574-75), but in the absence of any pre-Witori plant remains, we cannot argue for the introduction of the use of these plants with the appearance of Lapita pottery. The nature of the wet, humid climate and the soil environments appear to be inimical to the preservation of macroscopic organic materials, though further work on residues and phytoliths (Fullagar and Bowdery 1991) may provide clearer evidence. We hesitate to claim the presence of taro or other tubers in the period before the Witori event, but note that the evidence is consistent with data for the late Pleistocene on Buka Island (Wickler and Spriggs 1988), and that the majority of uses indicated by residue studies by Fullagar seem to indicate plant materials. This contrasts with ethnographic data, which suggest a concentration in recent times on using obsidian in connection with flesh, particularly the human body (Specht 1981).

DISCUSSION

Do the data suggest that the introduction of Lapita pottery to the area resulted in any major changes in settlement location, stone technology, pottery use or subsistence? The answer is "no" for settlement location and stone technology. Indeed, there seems to have been a long-standing stability in the selection of settlement locations, irrespective of whatever else might be indicated by the artefactual evidence and the fact that some locations might have been utilised for the first time only with the appearance of Lapita pottery. On this latter point we have noted Gosden's (1989) observations in the Arawe Islands on the south coast of New Britain that the appearance of Lapita pottery in that area seems to have been accompanied by a shift in settlement patterns. At the same time he acknowledges that certain parts of the coastline were only then becoming available for settlement as a result of uplift. A similar situation may have existed around Talasea.

Changes in obsidian technology were already underway in the period before the Witori event and these continued in the same direction, from controlled production of specific forms to a more expedient use of obsidian. Similarly, residue studies suggest a continuity of tool function until after the disappearance of Lapita pottery. The subsistence data are too sparse and incomplete to draw conclusions about possible changes resulting from or related to the introduction of Lapita pottery.

Lapita is the first pottery to appear in the area, and was probably produced locally. It was used for about 1000 years or more, after which pottery use in the area never again reached the same level of activity. The post-Lapita Type X pottery is currently unknown around Talasea, although it is common to the west on both the south and north coasts and on the Huon Peninsula. Even in recent times, pottery imported from the New Guinea mainland seems never to have reached a high volume. None of the Talasea Lapita sites seems to match the spectacular sites of the Mussau, Watom and Arawe Islands in terms of either pottery or associated artefacts, though the surface finds reported from Boduna over many years include sherds that may match some of the diversity of forms and

decoration of those other areas. Indeed, we are tempted to view the Lapita expression at Talasea as a poor relation of those other sites, though the disturbed nature of the Lagenda site and poor preservation of beach-side sites generally may give a misleading picture of the Lapita expression around Talasea.

Our view that few changes of any significance can be identified with the introduction of Lapita pottery to the Talasea area must be considered in the light of the region's volcanic history, since the marker beds of tephras signify two cataclysmic events. Studies by the Rabaul Volcanological Observatory, Macquarie University and Tokyo Metropolitan University (C. McKee, R. Blong and H. Machida, pers. comms) on the volcanic history of the Hoskins and Willaumez Peninsulas (cf. Blake and McDougall 1973; Lowder and Carmichael 1970) indicate that there was little volcanic activity in the late Pleistocene, but in the Holocene there have been at least nine major events. The Witori caldera-forming event is dated by ourselves to 3500 years ago, and to about 2600 years ago by Blake and McDougall (1973). This would have devastated much of central New Britain, including the flora and fauna. Its impact on the human populations is not clear at this stage. Evacuation of the area would have been essential, if the population survived the initial falls of tephra, since the tephra is likely to have been about one metre thick around Talasea. We are uncertain whether the same people, or their descendants, re-colonised the area, or whether other people(s) moved into a vacant landscape. The introduction of Lapita pottery seems to have occurred at that time, though the dating of both the appearance of the pottery and the Witori event requires further clarification.

Not only does there appear to be a difference between the Talasea Lapita sites and those elsewhere in the Bismarck Archipelago, but there are differences between the Talasea sites themselves, since Boduna and Lagenda stand apart from the other pottery sites. This may indicate that they were the main Lapita settlements of the Talasea area, and may reflect a difference between production-sites and importing-sites. How, then, do we explain the other pottery sites of the area? Does the presence of a few Lapita sherds justify their inclusion in the broader Lapita cultural complex, or are we dealing with sites of a different cultural group that imported pottery from the Lapita producers? At this point the discussion must return to the long-standing debate about what Lapita constitutes: was it just pots or a people? The Talasea data do not yet provide an answer, but do indicate that, in this area at least, the introduction of Lapita pottery was but one element in a long and complex history of continuity and change.

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