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Trade and Culture History across the Vitiaz Strait, Papua New Guinea: The Emerging Post-Lapita Coastal Sequence

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ABSTRACT. This paper, focusing principally on post-Lapita times, outlines the course and outcomes of work undertaken over the last two decades in the West New Britain–Vitiaz Strait–north New Guinea coastal region. It presents two principal arguments. The first is that major periods of movement and abandonment documented in the archaeological sequences of this region from about 3,500 years ago coincide with the record of volcanism in the Talasea-Cape Hoskins area. The second is that the post-Lapita sequences of this region differ significantly from the post-Lapita sequences emerging in the island arc reaching from Manus via New Ireland to southern and eastern island Melanesia, which show continuous occupation and pottery production.

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Focusing principally on the post-Lapita period, this paper considers the results and culture-historical implications of research that Gosden, Summerhayes, Torrence and I have undertaken over the last 20 years in the West New Britain–Vitiaz Strait–north New Guinea coastal region (Fig. 1)—a region that Jim Specht (1967) began opening up some 35 years ago. Specht taught me how to do archaeology in New Guinea. I worked with him in West New Britain in 1980 and 1981 and literally and figuratively followed in his footsteps for many years afterwards. This places me in a good position to draw together aspects of the work undertaken on some archaeological issues close to his heart.

The aims of this paper are two-fold. The first is to demonstrate that major changes in the archaeological sequences in West New Britain and areas to the west across the Vitiaz Strait and along the north New Guinea coast from about 3,500 years ago align reasonably well with episodes of catastrophic volcanism in the Vitiaz Strait and the Talasea-Cape Hoskins area of north-central coastal New Britain. Linguistically this latter area is the proximal source of North New Guinea and Papuan Tip Austronesian languages (Ross, 1988). It is also well-known as the geological source of much of the archaeological obsidian found in island Melanesia. The broad correlation between archaeological and vulcanological sequences may help account for the ways in which the central social, linguistic and biological characteristics of the coastal and island peoples in the region developed during the late Holocene. The second aim is to show that this emerging post-Lapita sequence in the West New Britain–Vitiaz Strait–north New Guinea coast region differs significantly from the post-Lapita sequences emerging in the island arc stretching from Manus down through New Ireland into southern and eastern island Melanesia where, in general, there is no break in pottery manufacture and the deposition of cultural materials is evident following the Lapita period.

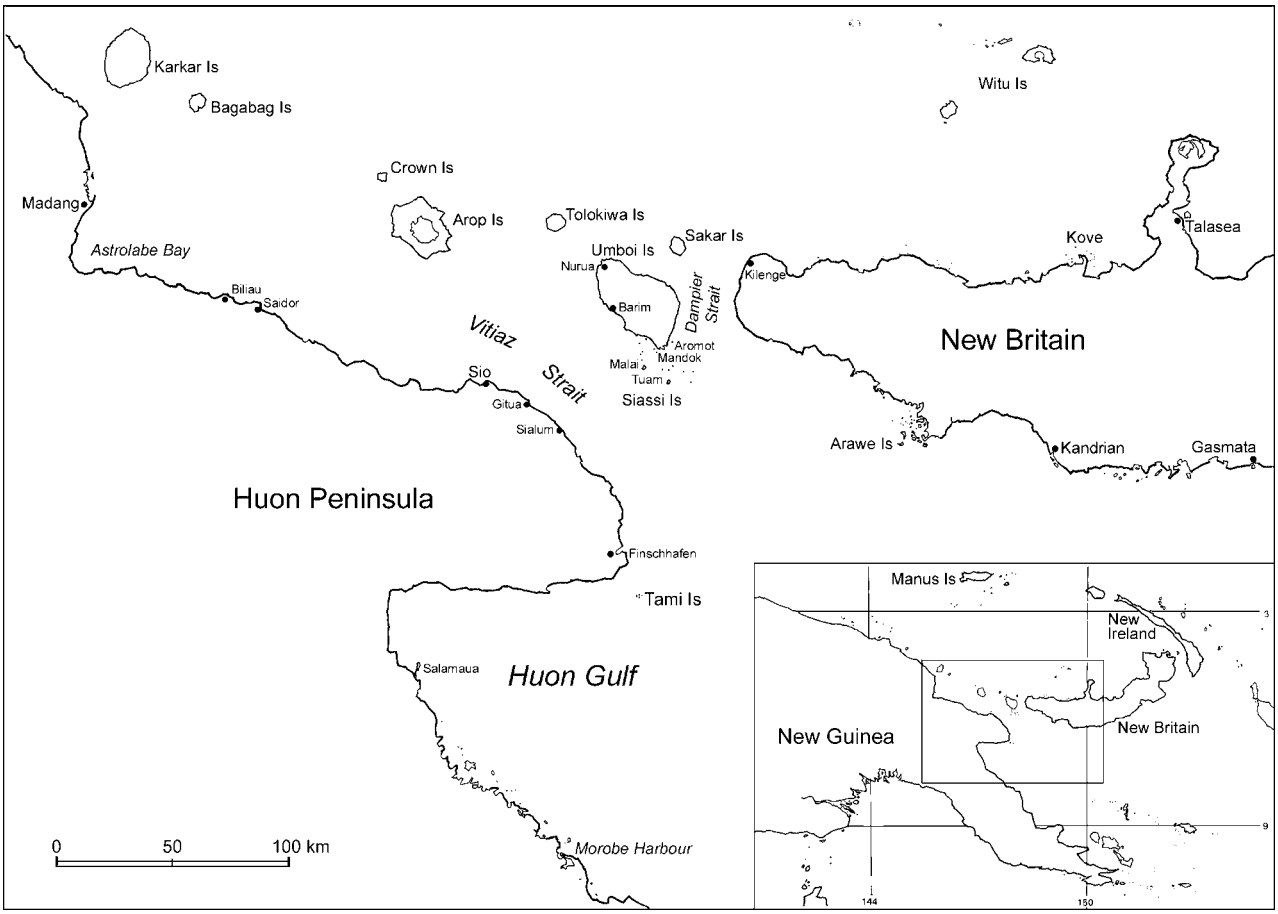

Fig. 1. Map showing places mentioned in the text.

Siassi and Sio

Specht (1973) completed an extensive survey of the Huon Peninsula in 1972 during the first field season of his long-running Trade and Culture History across the Vitiaz Strait Project (TACHAVS). He found 68 sites but only two, both in the Sio area, were considered worthy of further study: the large and highly disturbed shell middens of the KBP site on Sigawa (Sio Island), and the series of mounds forming the KBQ site on the adjacent mainland coast. I excavated these sites in 1984 immediately after finishing the first archaeological exploration of the nearby Siassi Islands and excavation of sites KLK on Tuam and KLJ on Malai (Lilley, 1986, 1986–1987, 1988*a,b*, 2002). My results are summarized at some length here, as they are pivotal to the arguments developed later in this paper. Age estimates (as elsewhere in this paper) are based on calibrated radiocarbon dates unless otherwise specified and are rounded up or down to the nearest 50 years. They differ slightly from the dates for these sites that I have published elsewhere owing to continual changes in calibration procedures.[1] Details of the dates in question, including laboratory numbers and standard deviations can be found in the site reports referred to above.

Although neither is continuous, the sequences in the Siassi Islands and Sio area can be amalgamated to suggest a culture-historical model of the development of regional exchange networks from about 3,150 years ago to the historical period (Fig. 2). As Harding (1967) anticipated in his *Voyagers of the Vitiaz Strait*, the earliest evidence for long-distance exchange in the Vitiaz region dates to the Lapita period, in this case a Lapita occupation some 3,150 to 2,750 years ago at the KLK site on Tuam in Siassi (Lilley, 1986–87: 57–61). Petrological analyses pointed to general compositional similarities between the Lapita and more recent pottery from the coastal Madang area (both contain coral-sand temper), but there is no evidence for cross-strait movement of commodities of any sort at this time, including pottery. Simply put, this means that the two-way cross-strait exchange which formed such a fundamental part of the historical trading system described by Harding cannot be derived from patterns of exchange during Lapita times. Moreover, in addition to being configured differently, the posited Lapita exchange system disappeared approximately 1,000 years before the emergence during what I call the Sau-Tambali Phase of an exchange system which can be considered ancestral to the ethnographic pottery-trading network.

The emergence of the "proto-system" of long-distance exchange some 1,700 years ago is signalled by the sudden appearance in the archaeological record of three, and somewhat later a fourth, distinct and distinctive styles of pottery, as well as the first evidence for cross-strait transfer of pottery, obsidian and probably chert. That the ethnographic trading network evolved from this proto-system is indicated by underlying continuities in most aspects of material culture and in the nature of local subsistence strategies. However, there are several noteworthy differences between the proto-system and the historical trade network. The most important here is that the configuration of pottery manufacture and movement differed markedly.

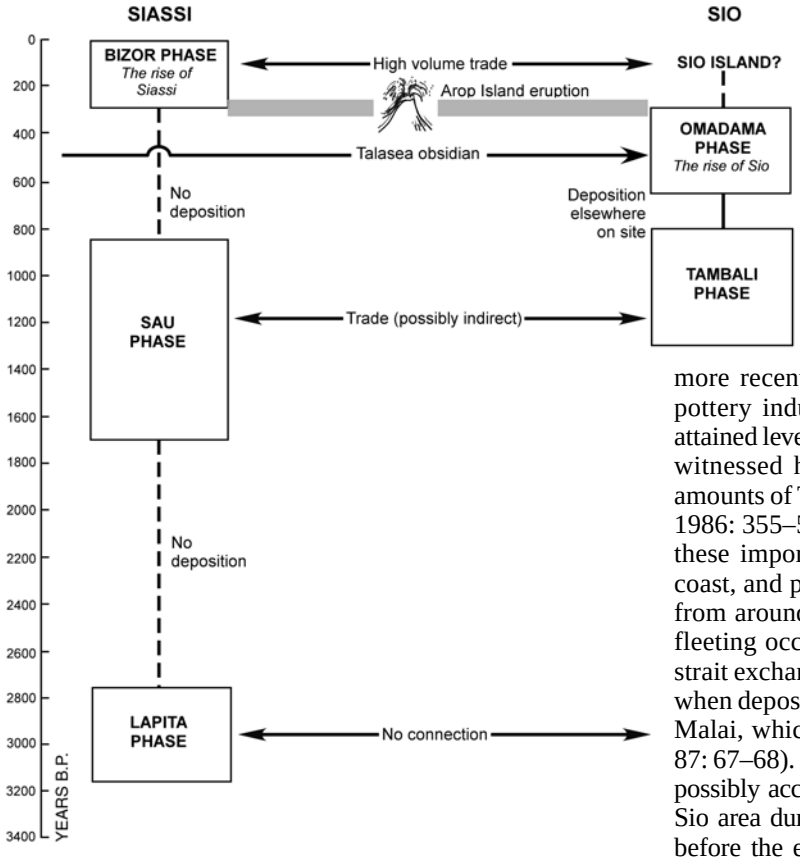

Fig. 2. Diagrammatic sequence of cultural change in Siassi and Sio.

Only one of the pottery industries that operated at the very beginning of the proto-system, Sio, survived into the ethnographic present. Another ware associated with the proto-system, Madang, also survives today, but it is present in the Sio area (and perhaps nearby Arop or Long Island)[2] only from about 1,300–1,000 years ago and may not have been made or at least traded very far before then. Of the two other early wares, I have already described Type X (Lilley, 1988*a*). I have little further information about the other, formally undescribed ware which I call Type Y (Lilley, 2000, 2002). It is very distinctive visually and petrologically, and on the latter basis may originate in West New Britain. Its dating remains uncertain. It may be associated with a radiocarbon determination of about 2,300 cal. B.P. (ANU 4619) from Siassi and thus may link with what might be late Lapita-early post-Lapita pottery from undated contexts in the nearby Arawe Islands (see below). At present, though, there is only this single determination of that age from my excavations on the Siassi Islands and in the Sio area (or Kove for that matter—see below), and it does not overlap with other dates from any of the sites. Moreover, nothing else was found that suggested an early post-Lapita presence. Thus, despite the ambiguous Arawe Islands material and the possibility of Type Y finds at Specht's Kreslo Lapita site (Lilley, 2002; Specht, 1991) and at Pililo in the Arawe Islands (Lilley, 2002; Summerhayes, pers. comm.), I hypothesize for now that Type Y is more likely to have appeared along with Type X and ancestral Sio pottery around 1,700 B.P.

The KLK site in Siassi was abandoned from about 850 to 500 B.P. (Lilley, 1986–87: 61), but at site KBQ on the mainland at Sio there are unambiguous indications that a number of important developments occurred at some stage between about 800 and 650 B.P., even though no deposits dating to this critical period have been excavated in the Sio area (Lilley, 1986–87: 71–72; Lilley, 1988*a*: 97–98). Most notably in the present context, excavated evidence from more recent deposits at KBP clearly shows that the Sio pottery industry of the Omadama Phase (650–300 B.P.) attained levels of intensity and specialization similar to those witnessed historically, at the same time that increasing amounts of Talasea obsidian began reaching the site (Lilley, 1986: 355–57). However, it should be stressed that despite these important developments on the north New Guinea coast, and patchy evidence for a human presence in Siassi from around 550 B.P., there is no indication of more than fleeting occupation of Siassi or of a resumption of cross-strait exchange until approximately 300 B.P. (Bizor Phase), when deposition accelerated at the KLJ site on the island of Malai, which is adjacent to Tuam in Siassi (Lilley, 1986–87: 67–68). In other words, a general intensification of activity, possibly accompanied by other major changes, began in the Sio area during the Omadama phase, almost four centuries before the emergence of an exchange system exhibiting a pattern of linkages like that recorded ethnographically.

There is no excavated evidence from the KBQ site on the mainland to cover the last 300 years, and the focus of local occupation seems to have shifted to the irretrievably disturbed KBP site on Sio Island during this period (Lilley, 1986–87: 68). However, there is a dramatic increase in the deposition of Sio pottery at the KLJ site on Malai at this time (Lilley, 1986: 297–301). This clearly indicates that there was a significant increase in the quantity of coastal New Guinea pottery transferred across the strait, which in turn suggests the possibility of further intensification of production in the Sio area. The Malai data also indicate that the bulk of the excavated Madang pottery was transported across the Vitiaz Strait during historical times. These developments are associated with increased deposition of a much expanded range of utilitarian artefacts and faunal remains and the first appearance of valuable manufactures in the Siassi Islands.

In short, while a shift to specialist pottery production had occurred in the Sio area by about 650 B.P., the excavated data suggest that the production of Sio pottery and cross-strait trading activity did not reach the levels of intensity recorded ethnographically until some time later—around the time that William Dampier first saw the Vitiaz Strait in 1700 A.D. (250 B.P.). I do not think Dampier or any other European who sailed through the region after him had anything to do with these developments. The changes may, however, be related to the fact that around the time of Dampier's visit, a cataclysmic eruption on nearby Arop Island caused the "time of darkness" that is discussed by Blong (1982) and perhaps implicated in Sio stories of a magically induced catastrophe that led people to move from the mainland to Sio Island. The volcanic event appears to have resulted in widespread disruption and population dispersal, which in turn may have necessitated a rearrangement of regional interaction patterns (Lilley, 1986: 476–478).

The Arawe Islands

After accompanying Specht on a visit to the area in 1985 (Specht, 1985), Gosden undertook detailed research in the Arawe Islands in southwest New Britain until 1992 (e.g., Gosden, 1985, 1991; Gosden & Webb, 1994; Specht *et al*., 1992). Work undertaken by Gosden and others associated with his projects (e.g., Summerhayes, 2000) has dealt almost entirely with Lapita, which I will not consider here, but post-Lapita deposits are present in some of these sites. Few detailed descriptions of the excavated post-Lapita material have been published or included in field reports. Working only from dated sites (and using the calibrated dates provided by Summerhayes [2000] rather than those Gosden has described elsewhere), it seems that the last vestigial traces of Lapita ceramics disappeared from the Arawe Islands by 2,300 years ago (Summerhayes, 2000: 27), and that ceramics did not reappear until about 800 cal. B.P., in the form of Type X, Sio and/or Madang wares from the New Guinea mainland. This material occurs in surface sites, as well as in sandy sediments above Lapita deposits, as at the Makekur (FOH) site on Adwe Island and at the Apalo (FOJ) site on Kumbun Island; or in shell middens stratified above a red-brown clay containing Lapita sherds, as at the Paligmete (FNY) site on Pililo Island (Gosden & Webb, 1994: 35–47, Summerhayes, 2000: 22–25).

It is this last site on Pililo Island that provides the date for the re-appearance of ceramics: 790 cal. B.P. from the base of the midden. (Summerhayes, 2000: 25). The picture changes somewhat if pottery in undated sites is considered. Incised and applied ceramics and sherds exhibiting "all-over [finger]nail impressions" were excavated in deposits of unknown antiquity at Winguru on Pililo Island (Gosden & Webb, 1994: 47 and fig. 15). Although the excavators presume them to be "late or post-Lapita", it remains uncertain how these ceramics articulate culturally and chronologically with the pottery recovered from the dated sites. It can be surmised that the finds are more than 1,000 years old owing to their stratigraphic position in the clayey deposits. However, from the information available it cannot be ascertained whether they were deposited without a significant break throughout the post-Lapita period, whether they were deposited only in the immediately post-Lapita times, before say 2,000 cal. B.P. at the latest, or whether they only appeared in the late post-Lapita period, from, say, 1,500 years ago.

The principal problem at Winguru is the dating of the various clay layers and the implications for continuity of occupation and deposition in the Arawe Islands. In their 1991 field report Gosden & Pavlides (1991: 1) note that their work at Makekur "confirmed the suspicion that… there is a period in the prehistory of this area of West New Britain during which pottery was not in use… it appears that this period will fall between 2,000–1,000 years ago". However, Gosden & Webb (1994: 47–49) argue for continuous occupation throughout the post-Lapita period on the grounds that the Lapita-bearing clay at Paligmete has a date of 2,682 cal. B.P. (Summerhayes, 2000: 25) from near the bottom, and dates of 1,048 cal. B.P. and 1,061 cal. B.P. from the top of the underlying clay, while the base of the overlying midden containing recent New Guinea ceramics has a date of about 790 cal. B.P.

There may in fact have been a substantial gap between the time the clay was deposited and the time the midden formed above it: a period of at least 1,000 years, perhaps more, coincident with the period mentioned by Gosden and Pavlides during which pottery was not deposited. This is because, despite the dates of c. 1,000 cal. B.P. at the top of the clay, it contains only Lapita ceramics, and in fact "proper" Lapita, as opposed to the cruder "terminal" Lapita from Winguru. A date of 1,000 cal. B.P. is far too recent for Lapita of any description, anywhere. Results from Siassi, Sio and Kove (Lilley, 1991) indicate that by that time, definitely post-Lapita ceramics such as the Type X found in the Paligmete midden and elsewhere in the Arawe Islands ought to have been present for upwards of 500 years. This suggests that, rather than indicating continuous deposition from 2,700 to 1,000 cal. B.P., the Lapita-bearing clay at Paligmete (and by extension, that in the other Arawes sites) may actually date only to the Lapita period, and that the 1,000 cal. B.P. determinations at the very top reflect downward migration of the dated material from the overlying, much younger midden owing to human scuffage and treadage and/or through natural processes. This in turn would imply that the material in the undated Winguru clay is in fact terminal or immediately post-Lapita rather than anything more recent. I return to this issue below.

Talasea

Building on work that Specht began many years ago (e.g., Specht, 1974; Specht & Sutherland, 1975), Torrence's studies in the Talasea area of West New Britain, especially on Garua Island and most recently on the mainland between Talasea and Kimbe, have been the subject of a series of valuable papers dealing with long-term variations in resource (especially obsidian) use and the disposition of human activity across the landscape (e.g., Torrence, 1992, 1994; Torrence *et al*., 1990, 2000). Her broader interpretations are discussed at some length as they bear directly on the relationship between the history of volcanism around Talasea and Cape Hoskins and the late Holocene archaeological record in the wider Vitiaz region that I want to highlight.

Although initially convinced that local events and processes were responsible for a continuous long-term sequence of gradual change which she detected in the Garua and wider Talasea sequence, Torrence has of late allowed for a more punctuated sequence of development and greater influence from non-local factors, especially during the Lapita period. Thus in her 1994 conference paper (p. 5), she noted that pottery appeared suddenly with Lapita, but then disappeared just as suddenly some time later (presumably immediately after production of classic Lapita ceased, as the only other ceramics known from the area are recent wares from the New Guinea mainland). She also noted that there was an abrupt shift in settlement pattern when Lapita appeared, and argued this was "the result of social changes unique to the Talasea region" (1994: 5–6). She went on to propose that there were underlying continuities bridging the pre-Lapita, Lapita and post-Lapita periods. She accepted, for example, that distinctive tanged obsidian tools, long known from work done in the TACHAVS Project (e.g., Specht, 1973) and recently described in detail by Araho (1996), were dated into as well as before the Lapita period (Torrence, 1994: 2, though cf. Torrence *et al*., 1990: 462). She also argued that other changes she observed in lithic behaviour represent "an accommodation" to gradual shifts in the subsistence and settlement system which unfolded over the last 6,000 years

(1994: 3). This perspective maintained the firm stance she took in 1992 when she argued that "changes…at Talasea can best be explained as the result of a long-term, slow, continuous change in subsistence and settlement patterns, rather than the sudden arrival of different people, ideas or material culture" (Torrence, 1992: 111–112).

In her most recent publications, Torrence continues to emphasize the benefits of a long-term view of change, and indeed maintains the same basic position that "a punctuated trend in lithic technology [can be] inferred to reflect a decrease in mobility and an increase in the intensification of subsistence practices" (Torrence *et al*., 2000: 225). It is fair to say, though, that she also acknowledges the elemental nature of shifts in the archaeological record and the likelihood of exogenous sources of change in the Lapita period in a way she did not do earlier. True, in 1990, with Specht and Fullagar, she argued that Lapita was somehow involved in the recolonization of Talasea following the cataclysmic W-K2 eruption about 3,600 B.P. They said, however, that "whether [these]…people bearing Lapita pottery were new to West New Britain or were previous residents returning with an adaptation to the new risks they would face, cannot yet be determined" (Torrence *et al*., 1990: 463). In 2000 she and other colleagues noted that after the W-K2 eruption:

> the character and speed of change is much more radical than before; for example, pottery is introduced, stone tool types [tanged forms] disappear, and the whole pattern of artefact discard is transformed…[it seems likely] that a major difference in human behaviour is required to explain the changes after the W-K2 event (Torrence *et al*., 2000: 241).

That difference is seen much less ambiguously as a result of migration or colonization dependent upon "processes taking place outside the study regions and probably beyond the island of New Britain itself" (Torrence *et al*., 2000: 241).

While three major eruptions occurred in Torrence's study area in the post-Lapita period, she and her colleagues note that two were much more limited in scale than W-K2, that unlike earlier events, the third, more violent eruption seemed to have affected only the Willaumez Peninsula, and that all three had significantly less impact on regional sequences of archaeological change than W-K2 (or the much earlier W-K1). They argue (Torrence *et al*., 2000: 242) that:

> in contrast to W-K2, W-K3 and W-K4 [which occurred in the period 1,400–1,700 B.P.] had very little impact on human occupation…Not only were the depths of tephra small…but it also seems likely that social strategies introduced after W-K2…created a large enough safety net such that the loss of resources could be coped with, perhaps through exchange networks or by seeking temporary refuge with people belonging to the same social network…social relations may also explain [rapid] reoccupation after the very severe Dk [Dakataua c. 1,000 B.P.] event…

This insight is central to the argument I develop below.

Discussion

The overall picture emerging from the foregoing research seems relatively straightforward. Following the catastrophic W-K2 eruption about 3,600 cal. B.P., people who made or used Lapita pottery colonized coastal areas of the Bismarck Archipelago from Siassi eastwards by about 3,300 cal. B.P. Lapita ceramics disappeared from the region between 2,500 and 2,000 cal. B.P. (Specht & Gosden, 1997).

In at least some areas, there was then an hiatus in the manufacture and deposition of pottery for a period in the order of 1,000 years. Aceramic activity seems to have continued around Talasea, but there appears to have been no archaeological deposition at all between 2,750 and 1,700 years ago in the Siassi Islands, in the Sio area, or the Kove area immediately west of Talasea. The situation in the Arawe Islands is unclear. Even though clays eroding from elevated parts of some of the islands contain only Lapita ceramics, they may have continued to be deposited from Lapita times until about 1,000 cal. B.P., well after the Lapita period. However, dated deposits less than 1,000 years old contain only recent New Guinea mainland pottery. Some undated ceramics recovered from clays below middens are thought to be late or post-Lapita, but exactly how "late or post-" is still unknown. I consider this material to be terminal Lapita, that the Lapita-bearing clays were deposited only during the Lapita period as conventionally dated (i.e., between 3,600–3,300 and 2,500–2,000 B.P.), and that there was a 1,000 year hiatus in deposition generally and not just of pottery at the sites, and thus perhaps a break in occupation of the Arawe area as a whole.

It is very important that this issue is resolved, as it has a significant bearing on the description and interpretation of regional patterns of post-Lapita change. This is because about 1,700 B.P., Sio, Type X and probably Type Y pottery appeared in the Vitiaz region, seemingly *de novo* after the postulated 1,000 year gap in deposition. Madang pottery may not have appeared until a somewhat later, as it is first found in the Sio area (and perhaps on Arop Island) in contexts only about 1,300–1,000 years old. Where Type Y fits chronologically is not clear, but whether it is immediately post-Lapita or only 1,700 years old does not affect the overall picture being developed here. Type X, on the other hand, disappeared between about 800 and 650 years ago. This is during the same period that Madang and Sio pottery acquired the distinctive characteristics of high-volume production for trade and began to appear in the Arawe Islands from about 800 B.P. and in the Kove area at the end of the period. Looking further afield, it was also the time that essentially modern Type A Adzera pottery probably replaced the earlier Type B in the Markham Valley (Specht & Holzknecht, 1971). Specht & Holzknecht (1971: 66) had no absolute dates of their own, but they noted White found "Markham Valley" sherds at Aibura in the Eastern Highlands above a level dated to about 680 cal. B.P. (GaK-622). Finally, the Vitiaz exchange network documented by Harding (1967) seems to have emerged only about 300 years ago.

In broad terms, this overall sequence seems to fit quite well with the sequence of volcanism around Talasea and Cape Hoskins described by Torrence *et al*. (2000). In addition to the broad coincidence of the appearance of Lapita and the W-K2 eruption in the period 3,600 to 3,300 B.P., it can be seen that the sudden appearance of the Vitiaz proto-system of exchange from about 1,700 B.P. broadly matches the timing of the W-K3 and W-K4 eruptions which occurred at some time during the period 1,700 B.P. to 1,400 B.P. Although Torrence sees little change occasioned by these more recent and less violent eruptions around Talasea, I propose that they had a flow-on or knock-on effect in areas to the west of the Willaumez Peninsula, prompting people from around the Kove area to move west into the Vitiaz Strait-north New Guinea region, as suggested by the aforementioned linguistic evidence for a relatively recent

west-east movement of Austronesian speakers of precisely this sort (Ross, 1988; also Lilley, 1991).

The flow-on effect may not have stemmed from any single eruption, as neither W-K3 nor W-K4 seems to have been especially devastating. Rather, small-scale population movement may have emerged as a reaction or adaptation to a series of individually relatively minor but cumulatively damaging tectonic events, as suggested by the closeness of the dates for the two volcanic events in question. As has been hypothesized elsewhere (Lilley, 2000), Terrell & Welsch's (1997), findings on the Sepik coast and offshore islands near Aitape fit into this sequence at this time. Their Sumalo ware, initially hypothesized to be pre-Lapita, has now been dated to about 1,300–1,100 B.P. This is roughly 500 years younger than the first post-Lapita Vitiaz wares, and substantially overlaps the earliest current dates for Madang pottery. On that basis, it seems likely that Sumalo ware is further evidence for the east-west population movement in question. I am not sure in this connection what to make of Gorecki's (1992; Gorecki *et al*., 1991) and Swadling and colleagues' (1989, 1991) claims for pre-Lapita pottery in the Sepik-Ramu hinterland. In general I agree with Spriggs' (1996) assessment of the situation, and follow him in noting that Swadling *et al.* (1991) have a charcoal date of 1,800–1,300 B.P. from Akari, which, as they themselves note, contradicts an older shell date of about 6,300 B.P. from the same stratigraphic unit. This puts the pottery from Akari into the same general period as Sumalo ware and the first post-Lapita ceramics from the Vitiaz Strait, and thus may connect it in some way with the proposed westward expansion of Austronesian-speaking potters. I would add, too, that although there is no evidence for when coastal Huon Gulf pottery first appeared, Specht & Holzknecht (1971) consider that ancestral Type B Adzera pottery may have developed in the Markham Valley around this time as well. The notion that these processes of change were sparked by a volcanic event (or series of events in a short time) rather than the internal dynamics of regional cultural systems makes particular sense when it is recalled that prior to the W-K3 and W-K4 eruptions there appears to have been little or no post-Lapita activity in much, if not all, of the region in question.

While it was violent, it seems unlikely that the Dakataua eruption around 1,000 B.P. had the same impact on wider regional sequences, because it appears to have affected only the Willaumez Peninsula and not beyond (perhaps because of the location of the Dakataua crater at the very northern extremity of that landform). This means that while the appearance of the first post-Lapita proto-system of exchange across the Vitiaz Strait can be tentatively tied to the expansion of the North New Guinea cluster languages, and both linked to a period of tectonic instability manifested in the W-K3 and W-K4 eruptions, similar claims cannot be made for developments in the region between 800 and 500 years ago. These developments do not appear to be linked to any linguistic shifts of note and seem to be generated solely by the internal dynamics of regional trade networks. The final phase of development of the Vitiaz trading networks prior to European colonization may be a different story, however, which returns to the theme of volcanism and cultural change. As noted earlier, this is because Arop, just west of Siassi, exploded dramatically around the same time that the ethnographic configuration of trade emerged, with many of the communities with which the Siassi Islanders traded being composed of the dispersed speakers of Austronesian languages of Arop origin (Lilley, 1986; Ross, 1988).

This broad regional sequence is quite different from the one evident elsewhere in island Melanesia, where it appears there was no break in pottery manufacture and/or deposition following Lapita. Pottery certainly disappeared from some places in which it had been manufactured during the Lapita period. In regional terms, however, pottery persisted throughout the post-Lapita period. Moreover, it evolved in a manner which maintained quite clear continuities with Lapita even if it can no longer be claimed to represent a coherent, widespread and long-lived incised and applied relief tradition (Bedford & Clark, 2001; cf. Spriggs, 1992, 1997; Wahome, 1997, 1999).

The same applies to obsidian distribution. White's (1996) sequence of maps shows very clearly that the movement of obsidian continued in the northern and eastern Bismarck Archipelago throughout the post-Lapita period, albeit with changes in quantities moved and in the relative proportions of material from different sources. The evidence discussed in this paper as well as that considered by White indicates that the same situation did not obtain in areas to the west of Talasea, where there was a long gap between Lapita and what followed it (accepting the uncertainty about the hiatus in the Arawe Islands). In gross terms, the pre-Lapita, Lapita and post-Lapita periods seem to differ little in the Admiralty Islands and eastern Bismarck Archipelago whereas there are no connections to speak of to the west of West New Britain before about 1,500 years ago—the five pieces of terminal Lapita-period Talasea obsidian from Borneo notwithstanding (Bellwood & Koon, 1989). In terms of both pottery and obsidian distribution it thus seems that the post-Lapita sequence in the West New Britain–Vitiaz Strait–north New Guinea coastal region differs significantly from that which obtains through a very wide arc of islands stretching from the Admiralties in the north down through New Ireland and into southern and eastern Melanesia. This last region remained a hive of activity, whereas in the western region it appears that after Lapita, those coastal localities known to have been occupied during, and in some case prior to, the Lapita period were abandoned, or at least the scene of quite different and much less intensive activity, the remains of which are yet to be detected archaeologically.

How the West New Britain–Vitiaz Strait–north New Guinea sequence links with post-Lapita events and processes immediately to the south, in the Massim and along the Papuan south coast, is an interesting question in this context. On archaeological grounds there may be some connection (Lilley, 2000), and Ross (pers. comm.) has linguistic evidence for higher level ties between his north New Guinea and Papuan Tip clusters. This is not the place to pursue such matters, however.

In closing, I do not think that volcanism "caused" the scenario outlined above in any but the most proximal sense: geological phenomena have no inherent capacity to cause cultural changes of particular sorts. Rather, as stated elsewhere in relation to the connection between Lapita and the W-K2 cataclysm (Lilley, 2000: 189), eruptions can give "a coincidental fillip to processes already in train", an unanticipated random nudge delivered at a particular juncture in a local trajectory of change that reorients that trajectory to a greater or lesser extent. In the case of Lapita,

W-K2 helped create the conditions for existing processes to produce a novel phenomenon out of long-standing social and economic connections reaching west from the Bismarck Archipelago along the north New Guinea coast towards Asia. In the case of the relationship between W-K3 and W-K4 and post-Lapita developments in the wider Vitiaz region, Torrence's insight about social strategies introduced after the W-K2 eruption, as quoted above (Torrence *et al*., 2000: 242), points to plausible cultural causes.

However, I propose that the reaction at that time to those particular eruptions produced a novel result—colonization to the west. This result can undoubtedly be accommodated by our knowledge of the societies concerned, given their inheritance from the people who overcame the devastation of W-K2. Yet it was certainly not an inevitable outcome of the longer-term processes of change evident in the period prior to the eruptions, a time during which there is little or no evidence for interest in the West New Britain–Vitiaz Strait–north New Guinea region rather than areas to the north, east and southeast of Talasea. In short, while acknowledging the undoubted inertia inherent in long-term trajectories of change, more weight should be placed on the relative influence of singular, random events than Torrence does, at least in her earlier formulations. I consider that chance is often as important as history in moulding the finer details of change in past human behaviour.

Conclusion

Clearly, a great deal remains to be done to test these still speculative hypotheses. In particular, much more fieldwork is required in the West New Britain–Vitiaz Strait–north New Guinea region, at least as far west as Madang and probably all the way to the Bird's Head in West Papua. Fieldwork is also required in the Huon Gulf and south along the coast of Morobe and Oro Provinces towards the Massim, as the former areas remain a complete archaeological blank and only very little has been done round the Papuan Tip. In addition to gaining a record of the archaeological sequences there, such studies would help determine what, if any, links joined developments in the Massim and Papuan Tip/south coast with those that occurred across the Vitiaz Strait. The post-Lapita sequence in the Arawe Islands urgently needs to be resolved as well, and all of the dates discussed in this paper need to be calibrated to the same standards to refine the chronological links (and gaps) under consideration. On a more conceptual level, further thought needs to be given to the interplay of one-off events and long-term processes in the patterning of past human behaviour, especially in a region with the tectonic volatility of island Melanesia, along the lines of the work being pursued by Torrence.

Notes

[1] Conventional radiocarbon ages (CRAs) were converted to calendar years using the CALIB (v4.3) computer program (Stuiver & Reimer, 1993). Determinations based on charcoal and other terrestrially-derived samples (e.g., sediment) were calibrated using the atmospheric decadal dataset of Stuiver *et al*. (1998*a*) with no laboratory error multiplier (K=1.0). Charcoal determinations were not altered for a southern hemisphere offset (McCormac *et al*., in press) given the proximity of the study area to the equator. Dates on marine samples (e.g., marine shell) were calibrated using the marine calibration model dataset of Stuiver *et al*. (1998*b*) with a ΔR correction value of 0±0 with no laboratory error multiplier (K=1.0). This ΔR value was used as a default as no local values are available for the study area (see Reimer & Reimer, 2000).

[2] Egloff (1975) got dates of only about 540 cal B.P. (GX-3561, GX-3633, GX-3632) for Madang pottery around Madang itself, but there is a date of 950 cal B.P. (ANU-1308) from Arop for a "clay B/style group IV" sherd that I think is probably Madang ware (Egloff & Specht, 1982).

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References

Araho, N., 1996. *Obsidian Stemmed Tools from West New Britain, Papua New Guinea*. Unpublished M.Phil. thesis, University of Sydney.

Bedford, S., & G. Clark, 2001. The rise and rise of the incised and applied relief tradition: a review and reassessment. In *The Archaeology of Lapita Dispersal in Oceania. Papers from the Fourth Lapita Conference, June 2000, Canberra, Australia*, ed. G.R. Clark, A.J. Anderson and T. Vunidilo, pp. 61–74. Terra Australis 17. Canberra: Pandanus Books, Research School of Pacific and Asian Studies, Australian National University.

Bellwood, P., & P. Koon, 1989. "Lapita colonists leave boats unburned!" The question of Lapita links with Island Southeast Asia. *Antiquity* 63(240): 613–622.

Blong, R.J., 1982. *The Time of Darkness. Local Legends and Volcanic Reality in Papua New Guinea*. Canberra: Australian National University Press and Seattle: University of Washington Press.

Egloff, B., 1975. Archaeological investigations in the coastal Madang area and on Eloaue Island of the St. Matthias Group. *Records of the Papua New Guinea Public Museum and Art Gallery* 5: 1–43.

Egloff, B.J., & J. Specht, 1982. Long Island, Papua New Guinea—aspects of the prehistory. *Records of the Australian Museum* 34(8): 427–446.

Gorecki, P., 1992. A Lapita smokescreen? In *Poterie Lapita et Peuplement: Actes du Colloque Lapita, Nouméa, Nouvelle-Calédonie, Janvier 1992*, ed. J.-C. Galipaud, pp. 27–47. Nouméa: ORSTOM.

Gorecki, P., M. Mabin & J. Campbell, 1991. Archaeology and geomorphology of the Vanimo coast, Papua New Guinea: preliminary results. *Archaeology in Oceania* 26(3): 119–122.

Gosden, C., 1985. An archaeological survey of the Arawe Islands, West New Britain. In *Lapita Homeland Project. Report of the 1985 Field Season*, ed. J. Allen, pp. 54–55. Melbourne: Department of Archaeology, La Trobe University.

Gosden, C., 1991. Towards an understanding of the regional archaeological record from the Arawe Islands, West New Britain, Papua New Guinea. In *Report of the Lapita Homeland Project*, ed. J. Allen and C. Gosden, pp. 205–216. Canberra: The Department of Prehistory, Research School of Pacific Studies, Australian National University.

Gosden, C., & C. Pavlides, 1991. Report of archaeological fieldwork in the Arawe Islands and the Yombon area of West New Britain Province, January and February 1991. Bundoora: La Trobe University. Typescript.

Gosden, C., & J. Webb, 1994. The creation of a Papua New Guinean landscape: archaeological and geomorphological evidence. *Journal of Field Archaeology* 21(1): 29–51.

Harding, T.G., 1967. *Voyagers of the Vitiaz Strait. A Study of a New Guinea Trade System*. Seattle: University of Washington Press.

Lilley, I., 1986. *Prehistoric Exchange Across the Vitiaz Strait, Papua New Guinea*. Unpublished Ph.D. thesis, Australian National University, Canberra.

Lilley, I., 1986–1987. Archaeological investigations in the Vitiaz Strait region, Morobe Province, Papua New Guinea. *Bulletin of the Indo-Pacific Prehistory Association* 7: 51–74.

Lilley, I., 1988*a*. Type X: description and discussion of a prehistoric ceramic ware from northeastern Papua New Guinea. *Bulletin of the Indo-Pacific Prehistory Association* 8: 90–100.

Lilley, I., 1988*b*. Prehistoric exchange across the Vitiaz Strait, Papua New Guinea. *Current Anthropology* 29(3): 513–516.

Lilley, I., 1991. Lapita and post-Lapita developments in the Vitiaz Strait-West New Britain Area. In *Indo-Pacific Prehistory 1990*, vol. 2, ed. P. Bellwood. *Bulletin of the Indo-Pacific Prehistory Association* 11: 313–322.

Lilley, I., 2000. Migration and ethnicity in the evolution of Lapita and post-Lapita maritime societies in northwest Melanesia. In *East of Wallace's Line: Studies of Past and Present Maritime Cultures of the Indo-Pacific Region*, ed. S. O'Connor and P. Veth, pp. 177–195. Rotterdam: A.A. Balkema.

Lilley, I., 2002. Lapita and Type Y pottery in the KLK site, Siassi, Papua New Guinea. In *Fifty Years in the Field. Papers in Honour of Richard Shutler*, ed. S. Bedford, D. Burley and C. Sand, pp. 79–90. Auckland: New Zealand Archaeological Association Monograph Series.

McCormac, F.G., P.J. Reimer, A.G. Hogg, T.F.G. Higham, M.G.L. Baillie, J. Palmer & M. Stuiver, 2002. Calibration of the radiocarbon time scale for the southern hemisphere: A.D. 1850–950. *Radiocarbon* 44(3): 641–651.

Reimer, P., & R. Reimer, 2000. Marine Reservoir Correction Database. http://calib.org/marine

Ross, M., 1988. *Proto Oceanic and the Austronesian Languages of Western Melanesia*. Canberra: Department of Linguistics, Research School of Pacific Studies, Australian National University.

Specht, J., 1967. Preliminary report on visit to Kilenge West New Britain District, T.P.N.G. Typescript held in the Australian Museum Archives.

Specht, J., 1973. Trade and culture history across the Vitiaz Strait: the 1972 field season. TACHAVS/1. Typescript held in the Australian Museum Archives.

Specht, J., 1974. Lapita pottery at Talasea, West New Britain, Papua New Guinea. *Antiquity* 48(192): 302–306.

Specht, J., 1985. Report on archaeological research in the Arawe and Kandrian areas of West New Britain Province. In *Lapita Homeland Project. Report of the 1985 Field Season*, ed. J. Allen, pp. 48–53. Melbourne: Department of Archaeology, La Trobe University.

Specht, J., 1991. Kreslo: a Lapita pottery site in southwest New Britain, Papua New Guinea. In *Report of the Lapita Homeland Project*, ed. J. Allen and C. Gosden, pp. 189–204. Canberra: Department of Prehistory, Research School of Pacific Studies, Australian National University.

Specht, J., & C. Gosden, 1997. Dating Lapita pottery in the Bismarck Archipelago, Papua New Guinea. *Asian Perspectives* 36(2): 175–199.

Specht, J., C. Gosden, J. Webb, W. Boyd & I. Lilley, 1992. Report on archaeological research in West New Britain Province, PNG. January-February 1992. Typescript held in the Australian Museum Archives.

Specht, J., & H. Holzknecht, 1971. Some archaeological sites in the Upper Markham Valley, Morobe District. *Records of the Papua and New Guinea Public Museum and Art Gallery* 1(2): 52–73.

Specht, J., & F. Sutherland, 1975. *Talasea: An Obsidian Source in New Britain*. Paper presented to 46th ANZAAS Congress, Canberra. Typescript held in the Australian Museum Archives.

Spriggs, M., 1992. What happens to Lapita in Melanesia? In *Poterie Lapita et Peuplement: Actes du Colloque Lapita, Nouméa, Nouvelle-Calédonie, Janvier 1992*, ed. J.C. Galipaud, pp. 219–230. Nouméa: ORSTOM.

Spriggs, M., 1996. Chronology and colonisation in island southeast Asia and the Pacific: new data and an evaluation. In *Oceanic Culture History: Essays in Honour of Roger Green*, ed. J. Davidson, G. Irwin, F. Leach, A. Pawley and D. Brown, pp. 33–50. Dunedin North: New Zealand Journal of Archaeology Special Publication.

Spriggs, M., 1997. *The Island Melanesians. The Peoples of Southeast Asia and the Pacific*. Oxford: Blackwell Publishers.

Stuiver, M., & P.J. Reimer, 1993. Extended ^{14}C data base and revised CALIB 3.0 ^{14}C age calibration program. *Radiocarbon* 35(1): 215–230.

Stuiver, M., P.J. Reimer, E. Bard, W.E. Beck, G.S. Burr, K.A. Hughen, B. Kromer, F.G. McCormac, J. v.d. Plicht & M. Spurk, 1998*a*. INTCAL98 radiocarbon age calibration 0–24,000 B.P. *Radiocarbon* 40: 1041–1083.

Stuiver, M., P.J. Reimer & T.F. Braziunas, 1998*b*. High-precision radiocarbon age calibration for terrestrial and marine samples. *Radiocarbon* 40: 1127–1151.

Summerhayes, G.R., 2000. *Lapita Interaction*. Terra Australis 15. Canberra: The Department of Archaeology and Natural History and the Centre for Archaeological Research, Australian National University.

Swadling, P., N. Araho & B. Ivuyo, 1991. Settlements associated with the inland Sepik-Ramu Sea. In *Indo-Pacific Prehistory 1990*, vol. 2, ed. P. Bellwood. *Bulletin of the Indo-Pacific Prehistory Association* 11: 92–112.

Swadling, P., J. Chappell, G. Francis, N. Araho & B. Ivuyo, 1989. A Late Quaternary inland sea and early pottery in Papua New Guinea. *Archaeology in Oceania* 24(3): 106–109.

Terrell, J.E., & R.L. Welsch, 1997. Lapita and the temporal geography of prehistory. *Antiquity* 71(273): 548–572.

Torrence, R., 1992. What is Lapita about obsidian? A view from the Talasea sources. In *Poterie Lapita et Peuplement: Actes du Colloque Lapita, Nouméa, Nouvelle-Calédonie, Janvier 1992*, ed. J.C. Galipaud, pp. 111–126. Nouméa: ORSTOM.

Torrence, R., 1994. Processes and events: differential rates of change in the Talasea region of West New Britain Province, Papua New Guinea. Paper presented to the 15th Congress of the Indo-Pacific Prehistory Association, Chiang Mai, Thailand.

Torrence, R., 2000. Archaeological fieldwork in West New Britain, PNG, May-June 2000. Australian Museum. Typescript held at the National Museum and Art Gallery, Port Moresby.

Torrence, R., C. Pavlides, P. Jackson & J. Webb, 2000. Volcanic disasters and cultural discontinuities in Holocene time in West New Britain, Papua New Guinea. In *The Archaeology of Geological Catastrophes*, ed. W.G. McGuire, D.R. Griffiths, P.L. Hancock and I.S. Stewart, pp. 225–244. London: Geological Society Special Publication 171.

Torrence, R., J. Specht & R. Fullagar, 1990. Pompeiis in the Pacific. *Australian Natural History* 23(6): 456–463.

Wahome, E.W., 1997. Continuity and change in Lapita and post-Lapita ceramics: a review of evidence from the Admiralty Islands and New Ireland, Papua New Guinea. *Archaeology in Oceania* 32(1): 118–123.

Wahome, E., 1999. *Ceramics and Prehistoric Exchange in the Admiralty Islands, Papua New Guinea*. Ph.D. thesis. Canberra: Australian National University.

White, J.P., 1996. Rocks in the head: thinking about the distribution of obsidian in Near Oceania. In *Oceanic Culture History: Essays in Honour of Roger Green*, ed. J. Davidson, G. Irwin, F. Leach, A. Pawley and D. Brown, pp. 199–209. Dunedin North: New Zealand Journal of Archaeology Special Publication.

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