
MANUS, MORTARS AND THE KAVA CONCOCTION

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INTRODUCTION

This paper addresses yet again the question of the function and origin of the finely-fashioned stone mortars and pestles from New Guinea which Ralph Bulmer and others enquired into and published on in the 1960's. I have set out to suggest that some connection exists between the development of the widespread stone mortars and their use in the early preparation, selection and propagation of the important Oceanic plant, kava. The suggestion is based on the possible role of mortars in the preparation of distasteful concoctions, and their apparent distributional overlap with wild and cultivated forms of kava, Piper wichmannii and Piper methysticum.

ASCRPTIONS OF FUNCTION

During 1963-64 Ralph Bulmer spent six months in the Highlands of eastern New Guinea, working with the Kalam people of the Kaironk Valley and, among other things, recording local perceptions of the natural environment. Stone pestles and mortars were notable artefacts of the region, along with their occurrence in a broad area of the Highlands and the Bismarck Archipelago. Local informants had no consistent explanation for the origin, manufacture or use of these sometimes elaborately fashioned stone objects. A search for a functional and historical explanation of the mortars and pestles, and other artefacts formed by pecking, grinding and polishing, such as stone club heads, has exercised many commentators on the material culture of New Guinea. Some suggestions about the age and possible uses of stone mortars were made by Bulmer (1964) who favoured the option of seed and nut grinding, especially of the edible nuts of Castanopsis acuminatissima and other rain forest tree species.

In support of the nut-grinding application for mortars and pestles Bulmer pointed to a concordance between the altitudinal limits of Castanopsis and the reported locations of mortars. Castanopsis requires humid conditions but may occur from the lower montane zone to sea level in some favourable areas (Paijmans 1976:65).
Bulmer's 1964 review gave a total of 127 mortars from the three administrative districts of the Highlands and their fringes, 35 from other parts of the eastern New Guinea mainland including 20 from above about 900m elevation, and 21 from the larger islands of the Bismarck Archipelago, New Britain and New Ireland. Mortars have generally been found below 1800m with the greatest concentration in the large intermontane valley systems of the Papua New Guinea Western Highlands (Bulmer and Bulmer 1964:70). This region has one of the highest present day population densities, based on the cultivation of the Ipomoea sweet potato over the last three to four centuries, and preceded by taro cultivation for the previous 9000 years or so.

BRONZE-AGE INSPIRATIONS?

Bulmer and Bulmer (1964:72) also suggested that bronze and pottery prototypes were the models for the elaborately formed, pecked and polished stone mortars, and implied therefore that these artefacts were relatively late in their development in New Guinea. On distribution alone it is difficult to reconcile the predominantly western New Guinea presence of bronzes and the almost exclusively eastern New Guinea occurrence of ornamented stone mortars (Pretty 1965). Although Specht (1969:283) regarded the technological connection between mortars and pestles and certain elaborately ornamented axes from Bougainville as rather tenuous, his view that the rather complex almost free-form plastic axe shapes mimicked early pottery styles was reiterated by Bellwood (1978:243) who saw parallels between pottery, the axes, and mortars and pestles.

The idea that the stone mortars and pestles could be a late introduction, having something to do with bronze and pottery, was seen to concur with a picture of their former widespread use, to become obsolete later with the destruction of extensive forest resources following the relatively recent introduction of sweet potato. Subsequent archaeological work in the Highlands Wahgi Valley swamps showed the ancient beginnings of an agricultural drainage system there by 9000 years ago (Golson and Hughes 1980). One of the lineages of taro, Colocasia esculenta, is now seen as having its domestication from wild forms in Northern Australia – New Guinea (Coates et al 1988). This gives support to the view that taro was a primary crop in the drained Highlands swamps (Golson 1976). The postulated short time range for the mortar and pestle complex, with pottery-bronze as the inspirational starting point, and forest clearance for intensive food production with sweet potato marking the end point, is shown to be untenable in the light of this new evidence.

Forest clearance for gardening is now well documented for the Highlands by at least 5000 BP (Powell 1982:33), long before any possible bronze inspiration for the stone artefacts could occur. More importantly there is now some archaeological evidence for the age of the mortars from three sites in the Papua New Guinea Highlands. Watson and Cole (1978:193) have radiocarbon dates from deposits stratigraphically below a stone mortar fragment at 3530±130BP (UW260) and above it at 3070±95BP (UW261). The site is at the edge of the Noreikora swamp, about 8km south of Kainantu. Bulmer (1973), again from the Eastern Highlands, has described a buried soil at Wanlek containing a mortar rim fragment and dated to between 5455±105BP (16860) and 2840±90BP (16861). White (1972:134) estimates an extrapolated age before 4690±170BP (ANU42) for a deposit containing another mortar rim fragment from the Nobme site in the Eastern Highlands. The pecking, grinding, and polishing technique for producing complex forms in stone appears to be well developed and applied to mortars at least two thousand years prior to any metal artefacts reaching the western boundaries of Melanesia, which is generally dated to around 2000 years ago (Bellwood 1985:281, Glover 1986:153, Ambrose 1988). The three dated mortar fragments are from the mid elevation 1600-1700m zone where many other intact and undated mortars have been reported, and while this is consistent with the altitudinal limits of Castanopsis it is also consistent with gardening before the arrival of sweet potato.

Bulmer's original view, that gardening and the destruction of Highlands forests led to the abandonment of stone mortars, would have to be modified, in the light of later evidence, to allow an age before about 5000 years ago for their introduction; but equally mortars could be useful in a gardening context, or a mixed swidden based system where a wide range of plants could benefit from the pulverising pestle, and this could imply an even earlier age for their introduction.

MORTARS AND GARDENING

The altitudinal range of the mortars and pestles, and the considerable antiquity of horticulture in the Highlands, could therefore be seen as an indication of their use for preparing garden plants as well as plants from more typically forested areas, such as Castanopsis, which itself may be propagated as a useful tree (Powell 1976:132). In this realm of garden plants it has been argued that the most likely use of mortars and pestles was for the preparation of mashed taro (Swadling 1981:50). Bulmer and Bulmer considered and discounted the mashing of bulky food items, such as taro, on the grounds of the relatively small capacity of the stone mortars compared with the larger wooden vessels used nowadays to pulp taro in many coastal villages of Melanesia. The small capacity, down to about 10cm cup diameter, their shallowness, usually with a depth of about one half the diameter, and the often elaborately fashioned ornamentation of mortars and pestles, indicate
that they were more likely to be used for ceremonial or cult purposes (Bulmer and Bulmer 1964:70). Whatever they were employed for, a small volume product is implied simply on the grounds of the limited capacity of most stone mortars. Smaller examples of this kind are the elaborately carved wooden mortars for crushing betel nut for the personal use of people too old to chew it in the usual way (Swadling 1981:60). Even smaller capacity portable stone mortars, from Guadalcanal in the Solomon Islands, have been attributed to betel nut crushing and nut cracking (Bühler 1949:259). The cavity of these is usually less than 3cm wide or deep; swarms of small cavities of this size are common on rocks and boulders throughout Melanesia where people have used them for cracking hard nuts such as Canarium.

Bühler (1946-49) distinguished between the common hemispherical bowl-form mortars from the Bismarck Archipelago and those which are relatively deep and voluminous vessels more like pottery, but made in stone. The large collection of mortars from the Highlands was made after Bühler’s survey, but no doubt most would be included in his bowl-form group. As a sub-group in his bowl mortars Bühler identifies those with a tapering funnel shaped outer profile found in New Hanover, northern New Ireland and East New Britain (1949:579). Specht (1966:379) illustrates another mortar of this sort, with a hemispherical bowl-shaped hollow, a flat wide rim, a recessed collar, and tapering to a narrow base which is slightly hollow. The narrow blunt base seems to be a pedestal designed for mounting in soft ground. I recorded another mortar of this form in 1974 at Maragot village, on the northwest coast of Tatau Island in New Ireland Province (Figure 1). The mortar was of unknown use to the people who showed it to me but they recalled that Wampes found it before the second world war. Wampes was dead, but an old man, Wakimat, then about 70 years old, pointed to Tochigor, where a small spring or rivulet escapes down a steep cliff, as the spot where the mortar was found. The distinctive tapering profile, recessed collar, flat rim and slightly hollowed base makes it very similar in detail to the mortar described by Specht (1966:379) from Rabaul, 160km to the southeast. The mortar was made in a light-coloured stone, completely pecked or hammer dressed, and with some flake damage around the rim perimeter. Another related pedestal base mortar is illustrated by Swadling from Tsoi Island near New Hanover (Swadling 1981:57).

A KAVA CONNECTION

A different class of little-known mortars can be found in the Admiralty Islands, about 280 km west of New Hanover, on Lou, Pam and Baluan Islands. These are very simple small capacity, hemispherical bowls ground into slabs of tabular rock, probably collected from nearby Sivisa Island. Their capacity is very similar to the pedestal mortars having a cup diameter between 10 – 15cm. The Lou-Baluan mortars also include a range of shallower hollowed slabs such as those illustrated earlier this century on Lou Island by Bühler (1935:26), as well as tabular slabs that are practically flat. Some of these slabs show multiple cut marks concentrated towards their edges (Plate 1); owners of the sites explain these cuts as part of traditional divination activities where red betel nut saliva and leaves of Piper betle are used to decide the most propitious course of action. The rolled up, cigar shaped, wad of leaf and red saliva is cut on the flat stone; the pattern of saliva on the cut unwound wad in some way indicates the best course of action. Parkinson (1907) relates a similar betel and pepper-leaf custom from Manus but without the use of a stone slab. Both bowl-cavity mortars and flat stones can be found on Lou and Baluan Islands at recently abandoned house sites inland from present day settlements. The use and ownership of these artefacts is still within the memory of older village people. At Umleang on Lou Island, the old owner Korup recalls how the hollowed mortars were used to prepare kava by beating the root to extract the juice which collected in the hollow. Kava use and the old traditional village sites were abandoned when a church established itself and persuaded people to move to the coast at Rei village in the 1930’s. On Baluan Island the same range of flat or bowl mortar slabs are found in areas of extensive stone-walling and terracing where houses once stood. Former owners can point out individual lineages' house locations and the disposition of stones, mortars, and the ceremonially important house gardens referred to as lalkoko. The house gardens were said to contain ornamentals, aromatics, ginglers, and kava or kau, all of which are still grown and occasionally used. Fortune’s work on Manus religion in 1931 pointed to the great importance of ginger in many aspects of magic, as well as betel nut, and other plants which were chewed to produce a desired concoction (Fortune 1965:307).

One of the missing elements in helping to explain the proliferation and demise of stone mortars in eastern New Guinea is ethnographic evidence for their systematic use in non-trivial ways. Reports of them being used water-filled as mirrors, or as containers of sundry items, are examples of trivial use because they exclude the pestle as an integral part of the mortar. The evidence from Lou and Baluan Islands is therefore important as a record of the specialised role of small capacity, bowl cavity, slab mortars in the preparation of kava in a traditional way.
A MAGIC CONNECTION

The association of mortars with serious ceremonial activities is described by Williams who visited the Lake Kutubu area fifty years ago. Williams (1941:30,101) doubts that the mortars were expressly made for the ceremonies he witnessed; none were newly made at the time and all were reported to be found in the ground around Lake Kutubu. Three of the four known mortars were used in the usi ritual which was basically directed to curing sickness. Only those men initiated to usi could deal with sickness caused by spirits of the dead and apply treatments using concoctions prepared in the mortars (Williams 1941:100). The remedial mixture pounded in the mortar included a selection of barks mixed with water. The high tannin content of most barks, whatever else was included, would be likely to make this a very astringent brew. It was drunk from a half coconut shell especially kept for these occasions, and not grown in the district. Williams sampled this "thoroughly disagreeable" mixture and noted "it is worth mentioning the unpleasantness, both to sight and taste, of the usi mixture", which he doubted had any intoxicating properties at all. The origin of the mortars being used at Lake Kutubu may not have been known, but mythical stories surrounding the origin of the usi cult did include the use of a stone mortar to prepare selected bark, while the chief character in the story, Somaia, was induced to dance, reel about, roll his eyes and poke out his tongue. Another version has Hobo, a main character, die leaving his good works in the usi cult behind him. The large flat concave stone used in the ceremony was said to be the hero's sternum, which was carefully wrapped in bark cloth for storage in the men's house (Williams 1940:110).

Williams identified a particularly important ritual plant named takorabo as "either true Piper methysticum (the Polynesian kava) or a kind of pepper very similar to it" (Williams 1940:116). Takorabo was an element in the arrow-head, or Piako Gwabu cult, which Williams thought to be more ancient than the usi. Takorabo was surrounded by religious association at Kutubu but its use as an intoxicant was unknown. Only two specimens of this plant were known to Williams' informants, one at Wasemi, an island in Lake Kutubu, the other from a place at the lake shore. During rituals to ensure hunting success or for mortuary ceremonies, sections of the dried stem of Takorabo tied to the ceremonial arrow-head were given a perfunctory bite by the participants. None of the narcotic properties of the plant were therefore involved. Given the rarity and token use of Takorabo it appears that its ritual importance must either have derived from a practice borrowed from other communities in the region, such as those to the south in the Fly River to Mappi River region where kava was an important item of cultivation and consumption (Nevermann 1938:180; Knauft 1987), or reflect a
Figure 1. Mortar from Maragot village, New Ireland. Total length 61 cm. A similar mortar with a wide flat rim and pedestal base is described by Specht (1966) from the Rabaul district of New Britain.

former period when the Takorabo plant was more plentiful and used as an intoxicant in the normal way. In either case it appears to have had no association with preparation in a mortar, as described above for the Admiralty Islands. The Kutubu use of kava seems consistent with its imminent extinction as a formerly important plant, rather than as a recently introduced novelty.

A GINGER CONNECTION?

Another example of the use of unpleasant distasteful concoctions made from especially selected plants has been described for the male initiation ceremony among the Bismin-Kuskusmin of the mountainous interior of the West Sepik. Poole (1987:149) describes so-called “heart palpitation substances” and “hot sacred substances” that are prepared from plants propagated in ritual gardens or gathered wild and simply eaten at ritual sessions without special pounding or mixing. Wild and cultivated gingers are the most important components of the fulsome menus which may also include the nuts or seeds of Castanopsis acuminatissima and Lithocarpus spp., Pandanus spp., leaves of Colocasia esculenta among others, bark of Glabulimima belgraveana, rhizomes of Kaempferia galanga ginger and others, and various roots, fruits, flowers and saps, mushrooms and tobacco. Some of these contain toxic or psychoactive chemical compounds that may induce cramps, nausea, vomiting, perspiration, rapid breathing, rapid heart rate, and headaches (Poole 1987:171). The use of plants with consciousness modifying properties is widespread in western Pacific societies, with betel, kava, tobacco and ginger being commonly cited along with other less well known plants (Marshall 1987).

As Poole has noted (1987:150), research on much of the useful flora of the western Pacific has concentrated on its value as food, rather than the culturally important pharmacological properties that can alter people’s psycho-physiological states. Strong pharmacological effects can produce strong cultural responses in
controlled forms of ritual. Following Bulmer's suggestion of their ceremonial or cult association, it is to this area that perhaps attention should be directed in considering the ubiquitous mortars and pestles of eastern New Guinea. Poole's detailed analysis of ginger use among the Bismin-Kuskusmin dwells on the effects of chewing and ingesting the rhizome directly; there is no suggestion of pounding in mortars or other preliminary treatment which might diminish or dilute the desired powerful and stressful condition the raw ingredients induce; but in another context, such as that described by Williams for the Kutubuans, the use of mortars for reducing unpalatable ritual plants to pulp was entirely appropriate.

The Zingiberaceae family is used widely in New Guinea for medicinal, stimulant, and ritual purposes with the rhizomes being commonly crushed to release their potent fractions (Powell 1976). This group should surely be considered as a candidate for treatment by pounding in mortars. The gingers occur from the coastline to the lower Montane zone and are often associated with revegetation after fire and gardening (Paijmans 1976). Their widespread use in Indo-Malaysia (Burkill 1935:2335, Ochse 1977:730-70) is paralleled in Melanesia; but however this wide distribution offers no explanation for the predominantly eastern New Guinea distribution of mortars, if indeed the gingers were prepared in these implements. Kava is in some ways a culturally similar plant to ginger in its cultivation, propagation and use from either wild or selected forms. It has a fibrous strong-flavoured rhizome which can be chewed directly or otherwise reduced by pounding. Like the gingers, kava appears traditionally to have been used widely in fraternal, medicinal, ceremonial and ritual contexts. The similarity extends to what Brunton refers to as blurred semantic fields for kava, ginger, turmeric, and areca nut (Brunton 1988:44).

ON KAVA ORIGINS

The *Piper* genus is widespread in Malaysia, New Guinea, the Bismarck Archipelago and the Solomon Islands, mainly as climbing plants, but of particular interest is the distinctive soft-wooded small tree or shrub form *Piper wichmannii*. This is perhaps the commonest species in New Guinea being described from the Vogelkop, Wamaden, the North Coast botanical type site, the Sepik District, the Morobe District, the South Papuan Coast, New Britain [and the Admiralty Islands], Bougainville, Guadalcanal, San Cristobal and Santa Ysabel (Chew 1972:22), and Vanuatu (Lebot et al. 1986). There appears to be a consensus that *P. wichmannii* is the wild ancestor of the widespread Oceanian sterile kava clone, *P. methysticum* (Brunton 1988:36; Lebot et al. 1986:6). The restricted distribution of *P. wichmannii* in Melanesia indicates therefore that this region is the ultimate source of all kava whether wild or one of the many selected variants of the domesticated *P. methysticum*.

Lebot has pointed to the great diversity of *Piper methysticum* in northern Vanuatu as evidence for a locus of domestication there (Lebot 1988:32). On the other hand Brunton has emphasised the ease with which cultivated sterile *P. methysticum* can be erased from the floral record when it is not actively propagated. Large gaps in its distribution between the Bismarck Archipelago and Vanuatu may be the result of its loss of favour for some reason, such as preference for betel nut chewing, and therefore its extinction by neglect (Brunton 1988:97). It could also be that it was never established on certain islands; pottery for instance has a patchy occurrence as a manufacture in Melanesia without impeding its widespread distribution. Another possibility for the diversity of kava forms in Vanuatu includes the later addition of Polynesian types, via the Polynesian outliers, to an already active kava using community.

Lebot has produced detailed chemical analyses on 318 kava specimens including 10 wild examples of *Piper wichmannii* and 308 *Piper methysticum* from a wide geographic range of sources, with the greatest concentration (251) from Vanuatu (Lebot 1988). The close chemical correspondence between far-flung examples of *Piper methysticum* with those from Vanuatu is the basis of Lebot's claim for it being a centre of domestication; but if Brunton is correct in his view that kava was far more extensively used in the past, its recent discriminating consumption in Vanuatu could be a remnant of a once more widespread practice.

Of the two kavas only *Piper methysticum* was carried east from its Melanesian source into the Pacific islands, while its presence there wherever climate and soil allowed shows that it was probably entrained in the cultural profile of the original colonists. Since sterile *P. methysticum* can only be artificially propagated its present day distribution, extending to very remote parts of the Pacific, probably indicates that it was nurtured continuously from the time of initial settlement and therefore its consumption has been a permanent part of Pacific Islands societies since their origin.

*Piper methysticum* has a different balance of active chemical compounds compared with the wild *Piper wichmannii*. Apart from the effects this has on the imbibers, there is also a major difference between the palatability of the wild and selected forms. *Piper wichmannii* is characterised by having a coarse fibrous rhizome with a very bitter and unpleasant taste giving rise to pronounced nausea (Brunton 1988:40). This is different from the rhizome that was customarily chewed by young women in Polynesia, or young boys in the Astrolabe Bay area of New Guinea (Birô 1901:102) and similarly among the Kiwai of the Fly River mouth (Landtman 1927:106) as part of the kava preparation routine.
It is perhaps significant that both the objectionable *Piper wichmannii* and the chewable *Piper methysticum* have been identified in the Admiralties on Baluan Island (Lebot 1988) and that mortars are used for the preparation of both. While a case may be made that powerful nauseating concoctions may assist the potency of rituals, as with the “heart palpitation substances” of the Bismin-Kuskusmin, less extreme potions may be more appropriate for other fraternal, medicinal, and ceremonial purposes. *Piper methysticum* kava can have an important role in all these functions in a way that would be less acceptable for the unpalatable *Piper wichmannii*. By preparing *Piper wichmannii* in stone mortars on Baluan Island the people can dilute the extract for a wider range of purposes without suffering the objectionable effects of eating it raw. A young man from Pam Island informed me that part of the preparation of kava included diluting the mixture with coconut juice. If this was a traditional habit it would make sense in the context of *Piper wichmannii* in rendering the kava more potable.

A SPATIAL CONCORDANCE

Bulmer noted that the mortar and pestle suite had an areal distribution that could indicate a centre of innovation on the northeast Papua New Guinea coast (Bulmer 1964:149), and that the necessary technology was probably introduced by sea-faring people with a knowledge of agriculture (Bulmer and Bulmer 1964:72). There is support for the claim of a maritime connection in that mortars have been found on islands in the Bismarck Archipelago, specifically New Britain, New Hanover, and New Ireland. The degree of maritime expertise needed to reach these islands is not necessarily sophisticated; all are within a chain of inter-visibility from the New Guinea mainland at one end and New Hanover at the other, each within reach by simple paddling canoes; but the great similarity of the pedestal-base mortars suggests that a wider realm of connection existed more consistent with a sail based traffic necessary to overcome the long interconnecting distances. There is no need to doubt the agricultural connection given its long history of development in New Guinea. On the other hand, with so many of the cultivated food plants of the Pacific Islands being ultimately sourced to New Guinea, it is notable that mortars which might have been used for their preparation did not accompany the plants to the East. There is no evidence that the Melanesian stone working technology was imported, but good reason to believe that it developed locally. For instance the technology to create carefully formed waisted axes is shown to be around 40,000 years old in the Huon peninsula of New Guinea (Groube et al. 1986). The isolation of the stone mortar and pestle kit to eastern New Guinea, Bismarck Archipelago, and the Solomon Islands, and its failure to spread with the maritime specialists to Oceania suggests that it was already abandoned before around 3500 years ago when the major eastern movements began.

The areal distribution of *Piper methysticum* kava in mainland New Guinea appears to be exclusively towards the eastern half of the island, but it is very widely established in nearly all the islands with suitable growing conditions throughout the rest of eastern Oceania (Brunton 1988:21). Surprisingly the parent to this very important plant, *Piper wichmannii* has not been clearly reported outside New Guinea and the southwest Pacific islands of Melanesia, while it appears to be absent from eastern Polynesia. Is it possible that the enigmatic mortar and pestle kit and the superseded *Piper wichmannii* have a connected history?

The distributions of *Piper wichmannii*, *P. methysticum* and the ornamented mortars overlap in the Bismarck Archipelago-eastern New Guinea region. Pretty’s graphic presentation of mortar and pestle distribution (1965:122) shows the greatest concentration of mortars at the eastern half of New Guinea which is also the western extremity of *P. methysticum* distribution in Oceania, while the presence of mortar and pestles from Paneai (formerly Wissel) Lakes in western New Guinea is interesting in being within the western range of *P. wichmannii*, but outside the present range of *P. methysticum*. A speculative scenario to account for this general configuration could be as follows.

A FORCEFUL BREW

The dedication to strong or violent tasting concoctions for magical and ceremonial purposes is widespread and presumably ancient in Melanesia; in New Guinea both ginger and wild kava, among other plants, would have served well in this role. They are similar plants as rhizomes, can be propagated in the same way from root cuttings, and can therefore be selected for their perceived qualities. Wild kava appears to be almost inedible in its raw form so that any incidental selection and domestication would have benefited from previous developments in methods for its preparation and dilution. If unpalatability has some correlation with ascribed efficiency in powerful ceremonial or magical contexts, then wild kava can be seen as a powerful plant on taste alone, but the unique added benefit of the real chemically induced narcotic effects could greatly increase its seniority among ritual plants.

Utilisation of gingers along with any of the nut-producing plants noted by Bulmer could have an equally long history but the consumption of wild kava would require it to be diluted in some way. Its pounding along with other plants on querns or in rock hollows could lead to the development of portable specialised mortars suitably ornamented to express the special value of the potent extract. The elevation of wild kava to an
important role in the suite of ritual plants follows from its distinctive pharmacological properties apart from its violent taste. Selection and propagation of a chewable more palatable but sterile *Piper methysticum* clone, but still with the important active chemical components, could ensure the plant’s acceptance in a wider range of ceremonial and secular uses, and a corresponding reduction in the ceremonial and practical value of mortars as an integral part of its preliminary pulping and dilution.

CONCLUDING SPECULATIONS

The time scale involved in this totally hypothetical course of change could be indicated by the known age of prehistoric ornamented mortars and pestles. They could have been manufactured for use before 5000 years ago and be associated with other movements in plant selection in the region such as those identified by Yen (1973:73). Mortars could have been used for all the plants noted by Bulmer for the Highlands valleys before the area became the venue for the specialised domesticated garden plants. The northeast New Guinea Highands to coastal concentration, which suggested a coastal point of arrival for these artefacts to Bulmer, can equally be identified as a location for their dispersal into the Bismarck Archipelago and the source of the eclipse of their usefulness when the new chewable kava clones were developed. The northern coast of New Guinea would make sense as a zone of dispersal for the presence of wild kava on Baluan, among the outer islands of the Bismarck Archipelago, as well as the presence of decorated mortars on New Hanover, New Ireland, and New Britain.

Manus has been settled for more than 10,000 years and has been an active contributor to the Oceanic dispersal of obsidian for at least 3400 years and of pottery for perhaps 2500 years. The delivery of these goods has been by sea in long-distance sailing canoes. As set out before, the Baluan tradition of using rock slab mortars for pounding includes both the wild and domesticated forms of kava and suggests a different legacy for its preparation compared with the common practice of chewing almost universally found elsewhere. Perhaps it is significant that the only other islands where pounding on mortar slabs is recorded unequivocally as the customary method of pulping kava is on Pohnpei and Kosrae in Micronesia, while there are less certain reports of pounding the rhizome in Fiji and Uvea (Brunton 1988:91). There are also affinities between Micronesian and Admiralty Islands languages (Ross 1988:326). The Pohnpei kava mortars are basalt slabs (Hambruch and Eilers 1936:242) that seem to be indistinguishable from the slabs used on Lou-Baluan for the same purpose. The tenuous connection of language, kava, and mortar use could have been mediated through the Admiralty Islands to the New Guinea north coast and Micronesia at any time within at least the last 3400 years. Perhaps the distinctive ornamented pedestal-based mortars from New Ireland and New Britain are older than those in Manus and Micronesia, and from a time when coastal canoe travel was readily achieved but before the major Lapita style voyaging feats from around 3500 years ago were made (Kirch and Hunt 1988).

Ralph Bulmer was probably correct when in 1964 he saw a ceremonial and cult function for the distinctive mortars and pestles. The dating of their appearance and demise can be modified by newer evidence but there is no reason to doubt their special function; ginger and wild kava seem to be good candidates to add to Bulmer’s original list but wild kava alone seems to have a better than normal chance of being primarily involved.

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