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– ARTICLE –

Oceanic Tattooing and the Implied Lapita Ceramic Connection

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ABSTRACT

Skin ornamentation is a universal human practice, whether by painting, incising, burning or tattooing, and it ranges in importance from simple personal adornment to a ceremonially aligned practice executed by specialists on high-ranking individuals. In Oceania, as elsewhere, tattoo is widely accepted wherever suitable skin, on any body part, can bear its permanent visible designs (van Dinter 2005; Krutak 2007). The ethnographic picture of the richly tattooed Polynesians has been seen by some as an expression of a decorative style applied in the dentate stamp designs of Lapita pottery from more than 2500 years ago. This view rests on an implied connection between the acts of tattooing on skin and dentate stamping on pottery. The persistence of complex designs over such a long time span may be doubted where surface decoration on later pottery in the region changed quickly in style and technique. The evidence for tattoo alone is hard to find in the archaeological record, but what little there is suggests a more complex story. This paper examines the comparative technologies between the complex multi-point Polynesian tattooing kits recorded ethnographically and Lapita stamped decoration. The survey shows a clear lack of equivalence between the tattooing tools of the Bismarck Archipelago or any putative 'Lapita Homeland', pottery dentate stamps and the implements of Polynesian tattoo.

Keywords: Oceania, dentate Lapita, tattoo tools, comparative technology.

INTRODUCTION

The paucity of information on the source of Lapita pottery dentate stamp ornamentation as a visual art has led archaeologists, for example Bellwood (1978: 247), to perceive continuity between the techniques of pottery decoration and historic Polynesian tattooing. The most considered statement of a relationship between tattoo and other ethnographically recorded productions from Polynesia was that of Green (1979), following Mead (*et al.*1973; 1974), who suggested that the formal elements of the Lapita art style were a likely basis for much of the later Polynesian style, as a result of deep structures indicative of continuous cultural transmission (Green 1990: 38). However, Mead's early tabulation (1971: 492) of 34 basic design units isolated from adze handles from 28 ethnographic areas of Polynesia, plus New Guinea, Celebes, Borneo, Formosa and China, showed only 8 tattoo design unit correspondences between two areas, Borneo and the Marquesas. Mead's modified design system for Lapita ceramics was technologically confined to dentate stamp sherds (Mead *et al.* 1973: 6) before its wider application to other Polynesian arts. Despite Green's caution (Green 1979: 28) that 'on the subject of Polynesian tattoo design, it is not so easy to set out a case for the use of rules similar to those on Lapita pottery', Kirch has adopted and expanded on the theme by claiming that tattooing was the inspiration behind Lapita pottery decoration (Kirch 1997: 142). This view is now so entrenched that Sand (2010: 227) believes that few archaeologists doubt the link between tattoo and Lapita decoration. Without evidence this view simply presumes that tattooing was the model for dentate stamped designs on pottery.

The acceptance of the *Tattoo to Lapita* equation has obscured other possible continuities in these design systems, such as an overarching primacy of fibre works as the source of patterned designs. It may also imply that the social observances within Polynesian tattooing had been foreshadowed by similar customs amongst Lapita potters. It is therefore important to examine the direction of the tattoo-pottery linkage used by so many authors in discussing the meaning, production and disposal of ornamented Lapita pottery. The simple functional similarity between Polynesian multi-point tools for tattooing and dentate stamping tools for Lapita pottery decoration supports a superficial claim for continuity in the traditions of recorded Oceanic art, but the implied connection would benefit from an examination of the two technologies in deciding the merits of the claim. It is also pertinent to question how pottery designs from between 3200 and

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2500 years ago could be reflected in recent Polynesian tattooing. Comparing the technology of pottery decoration from archaeological sources of some thousands of years earlier with ethnographically recorded tattoo is hazardous, and there is no demonstrated connection between Lapita tools of dentate stamping and tattoo implements used in Oceania.

Tattooing implements

Robitaille (2007) offers a comprehensive review of Oceanic tattooing technology and the distribution of what he refers to as 'perpendicularly hafted tattooing instruments' (PHTI). Robitaille (2007:160) notes that tattooing tools made from bone are almost exclusively found among Oceanic sub-group speakers of the Austronesian language family. His review of the ethnographic distribution of tattooing instruments is accompanied by a typological classification from which he produces a hypothetical historical development of PHTI technology in Oceania. This class of tattooing tool with angle-hafting in axe, adze or hoe-like form is in contrast to tools that have their points directly in line with a shaft handle in pen-like hafting. Simpler terms would be 'angle-hafted' as with hoes, adzes and axes on one hand, and 'straight hafted' as with pens and spears. In this paper I use the terms 'angle-hafted' and 'straight-hafted'.

In the case of tattooing there is a dearth of multi-toothed precursor implements in the Lapita archaeological record compared with later evidence. The difference is significant because many surviving Lapita tools are made from bone, a material that otherwise is well documented as fishhooks, ornaments, awls and needles in numerous archaeological sites spanning the last 3000 years. Tattooing blades are found fairly often in East Polynesian sites dating to the last millennium. For example, excavations at the Tangatatau Rockshelter in Mangaia, Cook Islands (Kirch *et al.* 1995) recovered eight well-preserved tattooing blades in deposits dated to around 1300–1400 AD. There are hundreds of tattooing implements from New Zealand, the last settled of the large Pacific islands, that have allowed Davidson (1984:91) and Furey (1996:54, 2002:53) to demonstrate changing technology over the short span of time since Polynesian settlement around 1200 to 1400 AD (Anderson 2009:25). In contrast to these records, the only reported bone multi-toothed tools from Lapita-associated deposits are the four from a midden at site TO1 Tonga (Poulsen 1987:207, Plate 68), (Figure 1) that appear to have prompted speculation about tattoo and its linkage to Lapita stamped designs. A shell artefact reported as a tattooing chisel from the Lapita age Kamgot site on Babase Island, Anir Group (Szabó & Summerhayes 2002:95) could be a small ornament. It has been rejected as a tattooing implement by Best (2003:76).

Tattoo was historically present in most of the Pacific islands and while early descriptions of the technology are limited it is possible to make broad regional comparisons. In contrast to Lapita dentate stamps the curved elements of tattoo designs were usually produced with a kit of sharp single or multi-pointed tools mounted in alignment or bound in clusters. There is a contrast between the materials used for dentate stamped pottery and tattooing tools. Straight and bent turtle scute from the Hawksbill turtle (*Eretmochelys imbricata*) is a likely raw material used for fashioning Lapita dentate stamps (Ambrose 1997, 1999, 2007). Frazier (2005) outlines the importance of turtle in general for coastal societies. Luna (2003) reviews the archaeological evidence for the important place of turtle in Oceania. Best likewise (2002:68), in quoting an unpublished paper by Marshall Sahlins, emphasises the high value of turtles to Pacific societies. An example is the legendary importance of turtle in Funafuti, Tuvalu where it was a symbol of chiefly supremacy (Roberts 1958:411), and Kubary's (1895:188) claim for its sacred place in Palau. Lapita pottery's complex ceremonial disposal is indicated at the Vao Island Lapita site in Vanuatu where meticulously applied dentate stamp designs were completely obscured by an over-painted layer of white lime as an undercoat for red ochre designs (Bedford 2006). The turtle shell that was used in creating the elaborate ornamentation might have complemented the ceremonial importance of Lapita pottery.

Figure 1. Tongatapu
The four bone tattooing blades excavated by Poulsen (1987). Length of the largest blade is 32 mm. Author's photograph.

West-east differences in Oceania

A survey of ethnographically recorded tattooing implements and their distribution in Oceania and Island SE Asia shows clearly the main technological differences within the region and, by implication, the difficulty of deriving the Polynesian tattooing kit from a Lapita 'Homeland'

source in the Bismarck Archipelago. The ethnographically recorded technology used for permanent skin markings in New Guinea in the region of the 'Lapita Homeland' lacked manufactured multi-toothed tools fashioned on a single bone blade, the standard tattooing implement in Polynesia and parts of Micronesia, a point recognized long ago by Finsch (1893: 282), who also drew attention to other differences between east and west Oceania, including the different roles of women and men as tattooists. Rivers (1914: 436) expanded on this theme and offered several hypothetical reasons for the differences. There is a contrast between the widespread distribution of simple tattooing implements using natural plant thorns and fish spines compared to the complex Polynesian kits with their multi-pointed tools manufactured from mammal bone, or large bird bone such as frigate bird, albatross, and in earlier New Zealand collections, moa.

This survey begins in far eastern Polynesia and extends through Micronesia to Island Southeast Asia in the west; finally arriving in Fiji via Melanesia. To borrow a term from Best (2002), this is a 'view from the East'. All the described tools are 'angle-hafted' in contrast to the 'straight-hafted' tattooing implements from Japan, parts of the Philippines and Pacific Coastal Americas.

TATTOOING TOOLS AND THEIR DISTRIBUTION IN OCEANIA

a) Eastern Pacific

Rapa Nui (Easter Island)

Ethnographically recorded examples are rare but Métraux (1940: 241) gives a comprehensive review of sources relating to tattoo in Easter Island, and provides a sketch of a six-toothed tattooing blade that tapers to a slight constriction where the small rounded butt is bound to the handle with tapa. This has a similar outline to a blade described below from Hawaii. An unusual feature of both the Easter Island blade and the Hawaii equivalent is their binding to the handle at a distance from the shaft end. This may be due to movement of the blade after it was collected but it can be regarded as a possible variant on normal distal-end hafting. Other tools described by Metraux (1940: 238) were housed in the Museum für Völkerkunde in Berlin, and the same institution in Vienna (Figure 2). Ayres (1995: 153) refers to tattooing implements in the Berlin Geisler catalogue from Easter Island described by Thomson in 1891 as unfortunately no longer available to be seen. Nevertheless Metraux's (1940: 237–238) account gives the following description, 'The combs are made of bird bone with the convex surface to the front. The length varies between 75 mm. and 90 mm. and the maximum width between 7 and 8 mm. The comb tapers toward the rounded butt or is slightly constricted near the top to facilitate lashing to the handle. The distal end has five to seven teeth.' Although these blades have a usual number of teeth they are longer than similar one-piece bone tattooing tools described from Oceania.

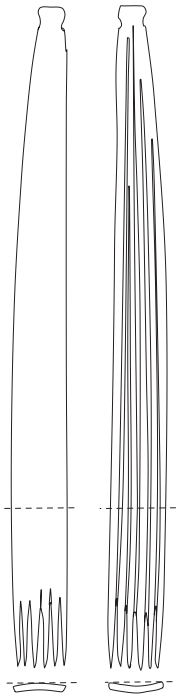

Figure 2. Easter Island
One of four similar blades from the Museum für Völkerkunde, Vienna. These blades are atypically up to 85 mm long compared with other Oceanic forms. The distinctive deep surface incisions are seen also in Figure 3c from Hawaii and Figure 6a from New Zealand. The dimensions given in the text by Métraux (1940: 241), are inconsistent with the length / width ratio of his published sketch. By permission of the Museum für Völkerkunde, Vienna

The Hawaiian Islands

The practice of tattooing in Hawaii was relatively limited according to Emory (1946: 263). In contrast, Allen (2006) provides a comprehensive report of tattooing implements. Although depictions of tattooed Hawaiians and descriptions of the process are recorded (Emory 1956, Allen 2006) there are no references to tattooing tools in Kaeppler's inventory of Cook's 3rd voyage artefacts (Kaeppler 1978b). Kirch (1989: 119) illustrates an ink-stained three-toothed tool from site D6–58 dated to the early 17th century AD (Figure 3a). Emory gives a description by a late 19th Century chronicler of several other Hawaiian tattooing implements housed in the Berlin Museum, but none are illustrated. Allen (2006: 108) reports 'several dozen' and provides illustrations of many artefacts, some from private collections including an implement with unusual binding, also described by Emory (1946). This is a seven-toothed blade tapering to a pointed butt end that was lashed to

an 11 cm long shaft of coconut leaflet midrib (Figure 3b). The bone blade is directly attached parallel and midway to the shaft, in 'axe-form', so that it cannot rotate to the usual 'adze form' hafting. Allen (2006: 49) reproduces an illustration made by Arago in about 1819 in which the tattooist was using an implement with the blade side-hafted midway on the shaft handle. Other parallel-hafted tools using composite fish bones or thorns are recorded historically in Kiribati (Allen 2006: 120), Manus (Ohnemus 1998: 115) and Taiwan (Ho 1960: 46 & Fig 2).

Several early post-contact bone blades illustrated by Allen (2006: 118) have three perforations, one at the butt end, one towards the toothed end and another between them. The latter perforation would be suited to binding the individual blades side-to-side as a composite tool. Allen also includes single bird beaks in an array of post-contact tattooing tools. A set of composite blades excavated by Emory and Sinoto (1961: 73) from Makani'olu, O'ahu 'of a type hitherto unknown' shows an implement with four blades deeply incised on one surface to produce teeth at the sharpened end and a pair of blades also incised on one surface. Allen (2006: 116) observes that the set of four blades fashioned as a group to provide a wide comb with 35 teeth, has no evidence of use. But the double, finely-incised Makani'olu blades with a total of 34 teeth show ink residue stains (Figure 3c). Kirch (1989: 119) remarks that the multiple-bladed Makani'olu tools are quite different compared with other implements excavated in Hawaii.

It appears from this that the multiple blade tools are probably a relatively recent introduction to Hawaii, being similar to other Polynesian forms such as those from Tahiti. Emory and Sinoto (1961: 39) describe numerous bone needles, bone picks, and fish spines from Oahu sites which, they infer, were used as natural picks to extract meat from shellfish, but Kirch (1989: 119) prefers the term 'awls'. In another context they could equally serve as single point tattooing tools.

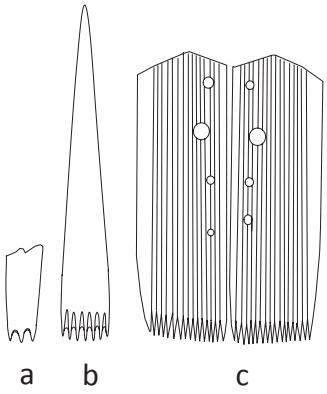

Figure 3. Hawaii
3a) Adapted from the blade photograph in Kirch (1989: 119). The fragment is 13 mm long; 3b) Drawn from the blade photographs of Emory (1946: 262) and described by Allen (2006: 115). Blade length 43 mm; 3c) Drawn from a photograph of a blade pair excavated by Emory and Sinoto (1961) from the Makani'olu site, Oahu. Allen notes that the tool appears to be unused. Drawn from the author's photograph. Length of tool 3c is 40 mm.

The Marquesas Islands

Suggs (1961: 97) refers to rare pottery sherds from Nuku Hiva that 'may be Tongan or Fijian in origin', but Dickinson's analysis (2006: 38) of Plain Ware pottery from the sites shows it to be manufactured locally, during the colonization phase of settlement. The presence of early pottery indicates a central Polynesian connection without the elaborate Tongan/Samoan tattoo tools that are recorded ethnographically, as set out below.

Sinoto (1970: 107) refers to tattooing implements from Hane, a Phase 1 settlement site originally dated to 300–600 AD (later re-dated by Anderson & Sinoto (2002: 252) to within 900–1200 AD). The simple un-perforated bone tattooing blade tapering towards the attachment end (Sinoto 1979a: 114; 1966: 52, and plate II, 30), is in a form very similar to items from Hawaii (Emory 1946: 262; Allen 2006: 115) and those described by Métraux (1940: Fig 23a) from the lost Easter Island blades (Ayres 1995: 152). Thomas (*et al.* 2005: 16) reproduced one of the surgeon-naturalist Langsdorf's drawings, now in the Bancroft Library, University of California, showing five half-sectioned tapered bird bones with the narrow end of one inserted directly into a twig or reed. (Figure 4) The wider end of each has several teeth that appear very short compared with those from central Polynesian collections. A translation from German reads, 'Fig 1. The instrument used for tattooing. 2,3,4,+ 5. The bird bones (serrated like a comb) necessary for the different figures of tattooing'. Langsdorf (1811: 14, 1813: 118) describes bird bone implements of various widths, all with sharp serrated points, used for details of the tattoo. The tools have the curved end profiles of split sections of bird bones, unlike the prepared flat tabular forms described for Tahiti and islands further west. The fastening system of the illustrated Langsdorf items, where an angle-hafted blade is directly inserted into a rod handle, resembles the simplicity of the implements from Easter Island and Hawaii. A comparison of the tabular Hane bone blade with the historic Langsdorf collection shows simplification in the blade technology over time.

Govor's research (2005: 65) on the Russian expedition to Nuku Hiva in 1804 notes that five depictions of a single individual by three artists all differ and raise 'serious theoretical questions about the validity of overly literal interpretation of the detail depicted in representations of Polynesian tattoo produced in the pre-photographic era'. This problem is given greater attention by Govor (2010: 104) in an extended treatment of the Russian expedition reports. She notes that the issue is compounded by the fact that the two main informants were European residents on the island.

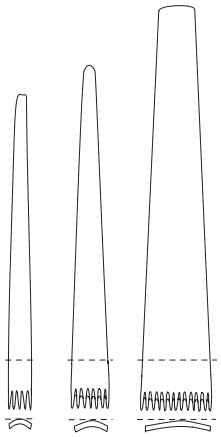

Figure 4. Marquesas
Three outline drawings from Langsdorf's illustration of four blades recorded from the Russian expedition 12-day stay in Nuku Hiva in 1804 (Govor 2010) and published in Thomas *et al*. (2005:16) that are housed in the Bancroft Library, University of California, Berkeley. Sketches of four blades are published by Langsdorf (1811:15) and described (1813:118). Unknown scale.

Handy likewise (1922:5), in reviewing Langsdorf's description of the social context of tattooing, draws attention to the two resident informants. Nevertheless Langsdorf's technical drawings of tattooing implements should be less subject to error than interpretations of the complex tattoo designs. A summary of early 19th Century chroniclers' descriptions by Handy (1922:10) describes a range of bone materials about 3 inches (~75 mm) long with blades of different widths having three to about twenty teeth employed according to the design and the body part being tattooed. The butt of the blade was inserted into a slit in a reed stalk or cane, with the tattooing being done by men expert in an operation that was surrounded by *tapu*.

An early 20th century rendition of a Marquesas tattooing tool kit from Steinen's own collection (von den Steinen 1925:83) shows two angle-hafted blades in adze-form with the narrow butts of the blades simply imbedded into a handle without binding or gum. He also refers to the blade being made of turtle shell, which is unusual compared with earlier descriptions of other Polynesian tattooing equipment. This may indicate that it was a tool manufactured for sale rather than use. Buck (1958:161) relates the case of early commercial traders importing rock from the Marquesas for manufacture into prized poi pounders in Germany for export and sale back to Marquesans, with several finding their way to the Bishop Museum. Govor (2010:151) shows that early Russian visitors in 1804 were already being offered non-traditional tattoos in exchange for gifts. Kjellgren and Ivory (2005:50) note that a Western market for Marquesan curiosities developed in the mid to late 19th Century that had a large influence on traditional wares. For example intricately detailed tattoo patterns were carved in low relief on wooden, life-like representations of four human legs. These were made to order for a colonial officer and had tenons so that they could be used as furniture legs. These cases should alert us to the rapidity of change after the arrival of Europeans. In an analogous situation, Kaeppler (1979:188) has documented rapid changes in tapa design and tapa beaters under the influence of missionaries, commercial traders or artefact collectors.

The Society Islands

The Cook collections include several well-documented tattooing implements from Tahiti. Kaeppler lists 18 bone blades from the voyage collections, with illustrations of some (1978a: Fig 48; 1978b:134, 152). Another complete tattooing tool from the Cook collection is an item included in the private Blackburn collection (Kaeppler 2010:309). All of these examples show adze-type, angle-hafted blades directly attached to the ends of handle shafts. The blades include narrow forms made from half sectioned bird bones (Figures 5a, b), and edge-bound composite forms to produce wider implements (Figure 5c). Of the five tools in the Göttingen University Cook voyage collection described by Urban (1965:63) two are made from a pair of bone blades symmetrically edge bound to form wider versions of 34 and 35 mm. The other three single blade widths are 12 mm, 12 mm and 4.5 mm. Moschner (1955:229) (Figure 5d) illustrates a rare triple blade instrument from the Cook collections. There are other tattoo instruments of more typical form in Stockholm (Söderström 1939), and in the British Museum illustrated in Edge Partington's lithographs (1890). From the Vaito'otia-Fa-ahia waterlogged site on Huahine, Emory (1979:203) mentions 'pearl-shell tattooing needles' that need fuller description. Sinoto (1979b:5) refers to artefacts from the Vaihi site in Ra'iatea as tattooing combs made of dog mandibles. These are unlike the Vaito'otia tools that he likens to Marquesan forms. Emory's claimed pearl-shell tattooing tool could be an incomplete tabular ornament. Sinoto also (1966 plate II, 31) identifies a pearl shell tattooing blade without teeth that may also be seen more appropriately as a small ornamental unit. On the other hand, Douglas (2005:36) quotes from Fesche, a witness on Bougainville's 1768 visit to Tahiti, who described the tattooing implement as an extremely thin piece of shell, toothed at the end. None other than bone implements have appeared in the Cook collections. Oliver (1988) has published parts of Captain Bligh's second journey to Tahiti in 1792 and included sections from Third Mate Tobin's diary. Tobin details that the 'Marking instruments are of various breadths, from a quarter of an inch…This is fastened to an handle forming an adze.' (Oliver 1988:71). Tobin's reference to 'marking instruments … formed of fish bone with teeth like a comb' was recorded a generation after the Cook visit and that makes it difficult to define the 'original' tattooing kit, particularly since early missionaries were attempting zealously to outlaw tattooing

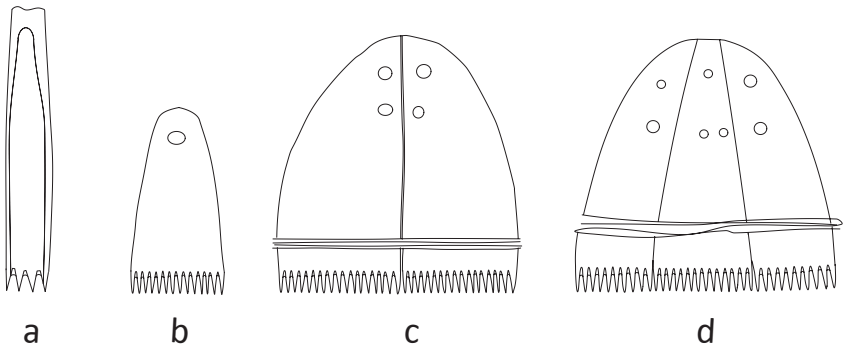

Figure 5. Tahiti
5a, 5b) Drawn from figures of Cook collection tools in the British Library published in Kaeppler (1978b: 152, 134); 5c) A typical blade drawn from a photograph of the Cook Göttinger Collection (Urban 1965: 63). Blade length ~35 mm; 5d) Line drawing from the illustration of Moschner (1955: 229) of Cook collection artefacts from Die Wiener Cook-Sammlung, Südsee-Teil, in *Sonderdruck aus Archiv für Völkerkunde*. The triple-blade tool is a rare complex example of the tattooing series from the common simple split bone implement at 5a. The full blade length is 33 mm.

(D'Alleva 2005: 94). Nevertheless fish bone tattooing needles occur elsewhere in the western Pacific, as described later.

The Cook Islands

Kirch *et al.* (1995) excavated a well-preserved and stratified series of artefacts and faunal and botanical remains from the Tangatatau Rockshelter on Mangaia Island. Included were eight bone tattooing blades of various sizes, possibly dated to within 1100–1500 AD. Both dog and pig bone were available for fashioning into wide blades on Mangaia. One of the two illustrated blades is in a tabular form, about 35 mm × 25 mm with eleven teeth (Kirch *et al.* 1995: Fig 7a). A second illustrated blade is formed from a split bird bone with six teeth. The teeth were formed using a technique familiar in early Archaic period New Zealand blades (Fig 6a) where one side has a parallel series of grooves while the obverse side remains plain. The teeth points can be simultaneously sharpened by simply honing a bevel on the grooved side. This efficient system for forming the teeth also appears in ethnographic specimens from Eastern Polynesia in Easter Island and Hawaii (Fig 2, Fig 3). The Tangatatau blades have single perforations and small indentations at the butt to aid attachment to the handle shaft using the same system that can be seen in early New Zealand collections (Fig 6a).

b) Southern Pacific

New Zealand

Compared with the relative scarcity of tattooing implements recorded archaeologically from the rest of Polynesia, New Zealand has large archaeological and ethnographic collections. The late period North Island Oruarangi site dating from about the 15th to the late 18th century AD has produced at least 210 tattoo blades with a range of plain and perforated varieties (Furey 1996: 4, 31), all based on a single split bone form with various teeth numbers. These blades are simpler in manufacture than those in the earliest New Zealand Archaic age sites where blades were made from tabular bone pieces. This simplification in blade production over time has the same tendency described above for the Marquesan tools.

The early South Island site of Wairau Bar (Duff 1956), dated by Trotter (1975: 80) to between 1350 to 1450 AD and not older than 1200 AD (Higham *et al.* 1999: 426) has a range of blades, with five having a single perforation at the butt end for attachment to a handle. Six of the Wairau blades have a small semicircular notch at the butt end to accommodate a shaft handle. In the Shag River Mouth site, dated mid-14th century (Anderson *et al.* 1996) there were also four bone tattooing blades; in three that were finished the attachment consisted of semicircular notches in the butt, and two had lateral notches as well (McGovern-Wilson *et al.* 1996: Figure 12.8). The butt-notch for blade attachment is the same design as that used in the Mangaia blade from the Cook Islands (Kirch *et al.* 1995). The availability of large Moa bone provided the tattooist with single, wide tabular blades with up to 18 teeth. (Figure 6a). Other South Island collections in the Otago Museum include blades with butt notch modification, with and without binding holes. None of these New Zealand blades show edge perforations or lateral asymmetry that could indicate they were bound as composite tool forms such as those seen in the ethnographic Cook collections from Tahiti.

The AD 14th century North Island Houhura collection of nine blades illustrated by Furey (2002: 53) is similar to the South Island Wairau Bar collection from the 13th century. These early tabular blades have single binding holes. The later Houhura blade collection has only two of

the nine with the same butt modification. Furey's study (2002:53, 2004:42) shows a reduction in blade width over time from early broad forms to later narrower types made from split section bird bone, as seen in the Oruarangi collections (Figure 6b). Confusing this picture is an illustration of 'Native implements used in Tattooing' by Polack (1840:45) that shows a typical Tahitian composite edge-bound blade. This illustration was redrafted in Robley's (1896:49) publication of New Zealand tattoo or moko with the caption 'Tattooing instruments'. Without evidence of its origin the Polack blade must be seen as an unlikely New Zealand form.

Significant technological change is shown in a collection of nine tattoo implements collected around 1830–1840 (Palmer 1958:390). Both bone and metal blades are contained in the tattooing kit. All four bone blades and one metal version show toothed ends whereas the other four metal blades are chisel ended. Later descriptions refer to the unconventional New Zealand practice of tattooing with sharp toothless chisel-ended tools, but these post-colonial observations are contrary to the evidence of the archaeological collections. The perverted trade in preserved heads and their post-mortem tattooing with chisels may also be involved.

The review of linguistic information by Anderson (2009:25) indicates the arrival in New Zealand of diverse founding populations from central East Polynesia islands around 1200 to 1400 AD. The closest collection to the early New Zealand blades in both form and age is that from Mangaia (Kirch *et al.* 1995). However the composite blades such as those described from Tahiti, are not recorded in New Zealand. This short chronology may indicate that the very wide composite double blades of Tahiti were developed some time after Polynesian mariners had departed for New Zealand or, that the tattooing implements of the founding New Zealand population used plentiful Moa bone suited to wide blade manufacture without the need to produce laterally stitched blades.

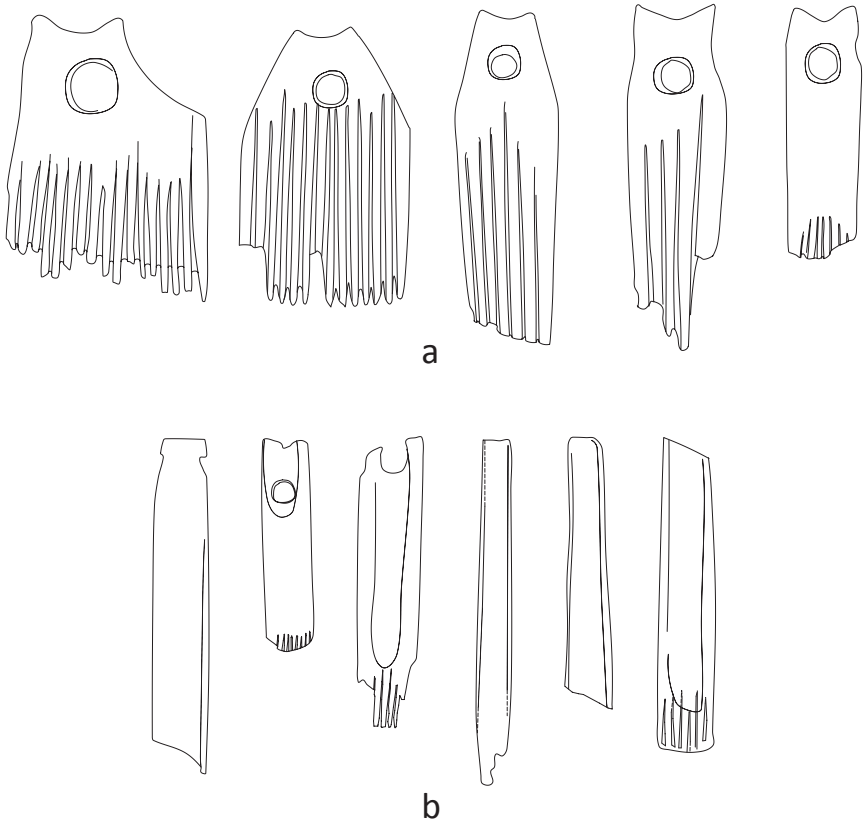

Figure 6. New Zealand

The New Zealand tattooing blade collections are the largest in Oceania and include a variety of forms. The two main categories could be described as flat tabular and split bird bone sections. 6a) Wairau Bar collection in the Canterbury Museum. The blades are made in flat tabular form. Length of longest tool is 45 mm. The grooved surface is also found in blades from Easter Island, Hawaii and Mangaia. Drawn from author's photograph. 6b) Oruarangi blades in the collection in the Auckland Museum. The six illustrated blades are from a collection of several hundred that are predominantly made from split bird bone. Many are damaged or appear to be in the process of manufacture. Length varies but is usually between 3 to 5 cm. From the author's photograph.

c) Central Pacific

Tonga

More than 229 Lapita pottery sites in the Western Pacific had been reported by 2007 (Bedford & Sand 2007; Anderson *et al.* 2001:3) but only one excavation in Tonga, near the eastern limit of recognisable Lapita pottery distribution, produced toothed tattooing implements (Poulsen 1987) (see Figure 1). Dentate stamp decoration on Lapita pottery was abandoned around 2600 years ago when it was replaced by plain ware in the Tonga – Samoa Polynesian heartland (Burley 1998:351). Pottery itself was abandoned in the Polynesian eastern Pacific from where most of the long distance Lapita art form comparisons are made. Only one of the tattooing tools from the Cook voyage ethnographic collections has been traced to Tonga (Kaeppler 1978b:212). It has the same construction as the Samoan versions where the bone blades are separated from the handle shaft by a turtle shell plate. The Cook example comprises five perforated bone blades bound together to produce a wide 28 to 29 point tool. It is mounted on a turtle shell backing plate that, in turn, is bound at its triangular apex to a handle. This indirect connection of the bone blades to the handle appears to be a system confined to the Tonga – Samoa collections.

The four tattooing blades recovered in Poulsen's 1963–1964 Tongan excavations of site TO1 (Poulsen 1987:207, & plate 68) are simple un-perforated rectangular forms, unlike the ethnographically described implements. Although Poulsen quoted McKern in likening the blades to modern implements they lack binding perforations. This makes them unsuited to hafting with turtle shell backing in the historically recorded manner. Groube (1971:295) raised doubts about the dating of the Tongan shell middens that Poulsen had excavated in 10 cm spits and the likelihood of their having been disturbed at a later date. The four blades show no obvious signs of weathering despite having polished surfaces, and one having delicate needle points. Lapita stamped tools, conversely, have blunt points, as are seen in sherds from the Ambitle EAQ site New Ireland in (Summerhayes 2000) or the Teouma site on Vanuatu (Bedford 2006), (Figure 7). Poulsen (1987:207) refers to the disturbance of the tools by a pit of post-ceramic age dug into the layer from where the implements were recovered, thus raising the question of their true age. Smith (2002:213) examined the radiocarbon determinations for Poulsen's site TO1 and concluded that the age of K-904 2779 ± 100 BP, used by Poulsen to date the layer relevant to the tattooing blades, was unacceptable. A later re-dating of the layer gives an age of (NZ-597) 464 ± 82 BP (Smith 2002:213).

Despite subsequent and extensive archaeological research in Tonga no other excavated tattoo blades have been reported (Burley 1998). In light of the importance and rarity of the Poulsen finds, and the question of their stratigraphic location, the disturbed nature of the deposits and the problems of dating, it has to be concluded that available evidence for the age of the four tattoo blades is inconclusive. Should they be of Lapita age they would be the earliest evidence for blade-style tattooing implements in the Pacific, and could thus be the prototype for other Polynesian tools. On the other hand, should they be of the later date then a Tongan model of origin would be difficult to reconcile with the existence of more complex and earlier tools from Mangaia and New Zealand, and the probability that they had originated in still earlier Tahitian forms.

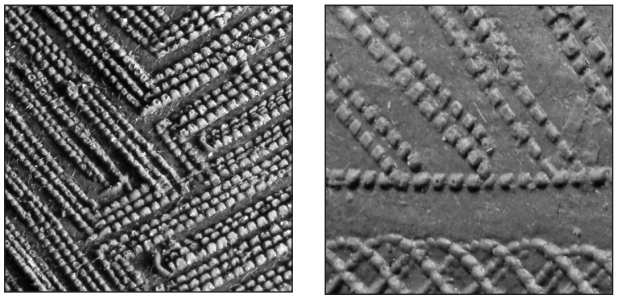

Figure 7. Photograph (left) of the typical dentate tooth form of a sherd from the EAQ Ambitle Lapita site, New Ireland, Papua New Guinea (Summerhayes 2000), and the Teouma site Vanuatu (by courtesy of Stuart Bedford). The images are oblique views of silicone impressions from indentations that are characteristically made with a blunt-ended stamping tool. Similarly formed impressions are present in the stamped decorated sherds from Nagsabaran site in Luzon (Cheng-Hwa Tsang 2007).

Samoa

There are no archaeologically reported tattoo blades from Samoa despite extensive research by Green and Davidson (1974). Marquardt (1899:9) likens the historic Samoan tattooing implements to the toothed blades of Tahiti, citing Joest (1887:69), but there is a clear difference in the attachment of the Tahitian version with the blade/s directly laced to the handle, whereas the recorded multiple Samoan blades have a connecting turtle shell piece between the blades and the handle. (Figures 8a, b). Marquardt illustrates a large range of blade widths in one collection, with one having up to 60 points. The ethnographically collected Samoan and Tongan bone blades are distinctive in having a small length-to-width ratio where the economising of the bone blade production is balanced by a greater use of turtle shell in the tool kit. The turtle's apparent ceremonial importance is relevant to the parallel role of high social status given to tattoo in Samoan practice. The Tonga-Samoan hafting method would also allow for blades of different widths to be assembled according to tool kit requirements, and for replacement of sections

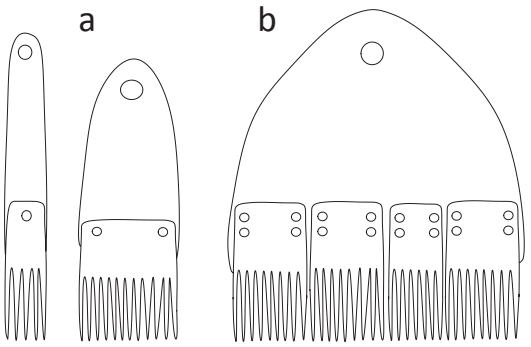

Figure 8. Samoa
Drawn from the photographs of Marquardt (1899). 8a) Single tabular bone blade narrow and wide forms; 8b) Typical multiple tabular blade form with bone sections attached to a turtle shell backing plate.

Figure 9. Tokelau
Drawn from a split bone blade illustrated by Edge Partington (1890) as Figure 5 in a Micronesia collection and held in the British Museum. The blade is described as having a 'bone head inserted in wooden handle'. Blade length ~50 mm.

that were damaged without the need to dismantle the entire tattooing tool. The combined Samoan tattooing tool kit is therefore more highly developed than in any other ethnographic collection from Oceania, apart from shared forms in Tonga. Unlike the finely fashioned handles of Tahiti, the Samoan blades are attached to short bamboo or light wooden shafts (Krämer 1903:75) in the manner of thorn implements commonly used by tattooists in the western Pacific. But like the Tahitian kit, the Samoan striking baton is a manufactured item. Marquardt (1899:20) refers in a footnote to the report by earlier authors Stair and Turner of an early 19th century custom of raising burn scars on the chest and upper arms with a glowing stick, or a burning wad of tapa placed in the desired skin location to produce adornments.

Tokelau, within sailing reach of Samoa has very simple blades made from split bird bone according to the item illustrated by Edge Partington (1890), (Figure 9). It is pertinent to note that Leach and Davidson (2008:477) show a high incidence of successful drift voyages to and from Taumako within a large part of the southwest Pacific. Rather than being isolated, drift and purposeful voyages from Tokelau and a wide arc of eastern islands between Kiribati and Fiji have a reasonable chance of a successful landfall on a Polynesian outlier.

d) Western Pacific, (south equatorial)

Polynesian outliers

Firth (1936:176) recorded the traditional view that there was no tattooing in Tikopia until its introduction from Rotuma about eight generations previously by a man known as Pu Tau Rotuma. Unlike other Polynesian tattooing, however, Tikopia lacks strict ritual observances and has some similarity to Melanesian practice. Pendergrast (2000:30) noted that although many men were practitioners of the art, there were also women recognised as experts. Pendergrast and Firth both describe the simple Tikopia implements as being made from a section of bird bone with one end diagonally bevelled to produce a sharp edge where several teeth were filed using sea urchin spines (Figure 10). Kirch and Yen's fieldwork in 1971 (1982:255) reported the same technique, confirming the description of the working tattooing kit. Kirch has described a major cultural change occurring in the Tikopia Tuakamali phase, beginning around 1200 AD (Kirch 2000:144). This might be evidence that the simple, single blade tattooing tools are an earlier type introduced to Tikopia before the more complex blades that are bound indirectly to a handle with an intervening turtle shell plate were developed in Samoa–Tonga. But in the example of Tokelau, relatively close to Samoa, this is not a simple case of late technology transfer. The skilled women tattoo experts in Tikopia were similarly present at other Polynesian Outlier islands Nukumanu and Nuguria where toothed bone tattooing blades from 2 mm to 6 mm wide were used (Parkinson 1907:232). A

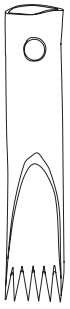

Figure 10. Tikopia
A typical split bird bone tool as described by Pendergrast (2000:20), with an approximate bone length of 34 mm.

study of Ontong Java and Nukumanu tattooing in 1908–10 by Sarfert and Damm (1929: 63) questions parts of Parkinson's account, and they illustrate four narrow imperforate bone blades with two to five teeth attached to the handle in a slot without binding. The striking batons are simple wooden rods. A tooth sharpener is made from a facetted 9cm long sea urchin spine. One tool from Nukumanu has a turtle shell blade and is attached to a handle made from an arrow shaft ornamented in Solomon Island style. This may be another example of an unconventional tool manufactured for sale rather than traditional use.

Figure 11. Marshall Islands
Descriptions of tattooing blades by Finsch (1893: 430) and (Spennemann 2009: 103) include simple tools with from three to twelve teeth, and bundled fish spines (Krämer and Nevermann 1938: 91).

e) Western Pacific, (north equatorial)

Micronesia

Unlike Polynesian colonization, over a period of 2000 years, of hitherto uninhabited islands in the central and eastern Pacific, or the relatively long isolation of New Guinea and Island Melanesia, the scattered archipelagos of Micronesia have experienced cultural influences from Taiwan, the Philippines, the Bismarck Archipelago, the Solomon Islands and Polynesia (Intoh 1999, 2008: 326, Irwin 1992: 127, Kirch 2000: 165, Lewis 1972), in a long process referred to by Rainbird (2004: 70) as settling the seascape by fusing islands and people. At the same time the many islands were connected through the efficient sailing canoes of the region. Petersen (2006: 84) refers to the first settlement entering from the west with a subsequent set of eastern cultural traits coming to typify western culture in a unifying agricultural change (involving adoption of a hybrid breadfruit variety as a mainstay food source) at around 1000–1500 AD. The first Spanish chroniclers noted tattoo in 1529 but the long period of contact with traders, missionaries and other foreigners disrupted traditional practices before there were reports of Micronesian tattooing in the later colonial and military historical periods.

The Marshall Islands

Marshall Islands tattooing was described on-line by Spennemann (1998) and in print (2009), drawing on a wide-ranging review of early German sources. After nearly 300 years of visiting ships from Spain, Britain and the United States the first available details of tattooing were recorded during the Russian exploring expedition under Captain Otto von Kotzebue in 1816, 1817 and 1824, but the artist who accompanied the expedition was less than accurate in his depictions, and these were modified further by later copyists (Spennemann 2009: 12). Marshall Islands tattooing tools included narrow bone blades with 3 to 5 teeth and wider versions with up to 12 teeth angle-hafted to wooden handles (Spennemann 2009: 103; Finsch 1893: 430) (Figure 11). According to Spennemann's review (2009: 134), professional master craftsmen were the tattooists and the procedure was done with great ceremonial attention in special housing at restricted island locations. According to Finsch, the male tattooists in the Marshall Islands use a pair of blades similar to those described by Kubary (1887: 79) for Palau and Yap, where women there were the expert tattooists. According to the report of the Hamburg Science Foundation South Seas Expedition of 1908–1910 by Krämer and Nevermann (1938: 91) toothed bird bones and bundled fish spines were used to produce implements of different size. The use of toothed bone blades, as well as of natural spines and thorns, may indicate that a relatively recent technological change was taking place.

Within the range of archipelagos from Tokelau in the south through Gilbert, Marshall and Caroline islands to Palau in the west, tattooing was performed with simple toothed bone blades. At the same time, some operators employed natural plant spines. Finsch (1893: 347) noted that the Kiribati (Gilbert Island) tattooing equipment differed significantly from the Marshall Islands kit to the northwest. Women were the tattooists and use a thorn in the manner he found similar to that on the Papuan coast of New Guinea. Finsch remarked on the speed of tattooing achieved with a single thorn angle-hafted on a wooden shaft, and in his experience the pain was not great. The black design was drawn on the skin and later punctured in by a tap on the shaft holding the thorn.

Pohnpei

From Pohnpei, O'Connell's sometimes creatively-embellished travelogue gave an account of his 1826 arrival and sojourn on Pohnpei with details of tattooing as a female skill, in which citrus thorns bound to a wooden handle were used (O'Connell, ed. Riesenberg 1972: 113). In a footnote, Riesenberg refers to both thorns and a bird bone with filed teeth as the implements used, echoing Hambruch and Eilers (1936: 267) who give details of the process, equipment and ceremonial aspects. They illustrate three implements (p. 271) that were collected during the 1908–10 Hamburg South Seas Expedition (Figure 12). One with four thorns angle-hafted and bound with fine twine

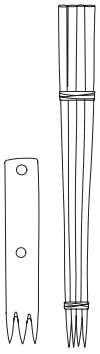

Figure 12. Pohnpei
A simplified outline from the isometric illustrations of Hambruch and Eilers (1936: 267). They give drawings of one perforated bone blade and two thorn-based implements.

to the end of a cane handle, one with ten thorns bound to the end of a wooden handle, and an unusual specimen of a three-toothed bird bone with a supporting strut that extends from a perforation midway along the length of the blade to the wooden handle. The striking baton was a rough piece of wood.

The Caroline Islands

The central Caroline Islands have similar multi-pronged tattooing implements made from bird bone. Damm (1938: 15) illustrates a distinctive carved striking baton in bird form from Ifaluk that differs from the usual undecorated wooden version. From Sorol he illustrates a set of three tattooing blades about 32 mm long with 3, 5, and 9 teeth respectively that were lashed to the thicker end of a 30 cm long tapered wooden handle (1938: 232). He also records a local story that the introduction of tattooing to Sorol Island was by a man from Mogemog. Damm (p. 160) refers to tattooing tools from Faraulip Island with the usual Caroline Islands form. From Oleai in the central Caroline Islands, Krämer (1937: 230) describes toothed blades made from frigate bird bone, and a baton 45 cm long with a bird-shaped striking end. In Fais, tattooing on women was done by women (p. 324). In the west Caroline Islands of Tobi and Ngulu, Eilers (1936: 146) gives detailed descriptions of the tool kit with three blades and two carved striking batons. One blade with 14 teeth is said to have unconventional binding and is made from tortoise shell. The other two are the usual split bird bone blades one with four teeth and all perforated to accommodate a bamboo handle sharpened at both ends. The batons are carved from *Calophyllum* wood 32 and 34 cm long and around 5 cm wide. One has a finely carved grip while the other has a flattened grip wrapped in coir. The ornamented carved striking baton is a feature of Central and West Caroline Islands implements compared with the more common simple wooden shaft.

Palau

The chronology of settlement in Palau in western Micronesia is important in connecting the islands with the broader history of settlement to the east in Oceania. Clark (2005) identifies initial occupation at around 3000 BP when expansion elsewhere from the 'Lapita homeland' in the Bismarck Archipelago was approaching its limits in Tonga and Samoa. Historically, tattooing with complex designs was well developed on Palau and Yap; Intoh (2008: 331) refers to the intricate tattoo designs shared between Palau, the Southwestern Islands and the Central Caroline Islands. Women were the tattooists using bone tools (Kubary 1887: 79), and they employed basic rectangular blades made from fruit bat bone, one with two or three teeth, and a larger one with seven. (Figure 13) Both blades have perforations for binding to the handle. Eilers (1934: 312) likens the toothed blades of Palau to those of Nukuoro and Nukumanu. Krämer (1926: 34) notes that the perforated tattoo blades are made from the bones of flying fox and frigate bird, and illustrates one with a handle penetrating the blade with another bound with fibre to the side of the handle made from the stem of a ginger plant. Later observations of tattooing on Palau by Dark (1987: 6) could find no traditionally used tattooing tools, but informants described blades made from megapode and dugong bone. The blade could have a notch or hole to accommodate the handle. Other tools were made from ray tail spines. Three steel needles were used in the 1980s.

In summary, the range of implements employed in Micronesia encompasses the basic toothed blades with the use of bound natural spikes appearing to be confined to the eastern islands of Pohnpei, Marshall and Kiribati. Either women or men have the right to practice tattooing. The increased frequency and availability of inter-island travel in the colonial period built upon the traditional transfer of people, designs and technology. Although the traffic and sharing of equipment and designs could reduce any earlier regional differentiation, the basic simplicity of bone blade and plant thorn implements appears to be a reflection of widespread pre-colonial tattooing kits. The simple blades would not be out of place in other islands

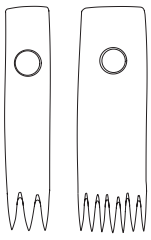

Figure 13. Palau
Drawn from Kubary's (1887: 79), description of basic rectangular blades made from fruit bat bone, one with two or three teeth, and a larger one with seven.

in Polynesia, including Poulsen's TO1 group. This raises the interesting issue of whether the original tattoo practitioners in these archipelagos used natural spikes or manufactured toothed blades where now both may occur. The angle-hafting of both is consistent with attachment systems from Hawaii and Easter Island to Palau, but natural spikes are predominantly used in regions to the far west in Island South East Asia; the Bismarck Archipelago and coastal New Guinea.

f) Far Western Pacific: Island Southeast Asia

Tattooing was common from Japan to Indonesia. Thorns or metal replacements are used throughout Island Southeast Asia and the coastal mainland. The fastening of points directly to the handle in pen style is the familiar method used in Japanese, Burmese and Thai tattooing implements (Dinter 2005: 66,76,79). This direct hafting method has a discontinuous distribution from Japan to Burma being interspersed with angle-hafted implements from Taiwan to Indonesia.

Taiwan

Taiwan records show that over half of all the aboriginal tribes from coastal plains to mountain practiced tattooing (Ho 1960: 44). The Atayal women tattooed with multiple thorns bound together in a row in axe-like hafting implements (Ho 1960: 46 & Fig 2; Krutak 2007: 62–64), (Figure 14). Two of Ho's five illustrated implements have fibre lashing to aid the fastening of the bound thorns, while three are simply embedded into the handle. Also shown is a wooden club 4 cm in diameter and 19 cm long. One end is reduced to a handgrip about 3 cm in diameter. Atayal women tattooists undertook special training for their role (Ruey *et al.* 1955: 126). The illustrated southern Paiwan tattooing instruments used a single citrus thorn angle-hafted into the handle while both men and women 'of noble birth' practiced the art. The depth of the thorn penetration was limited by a binding at a short distance from the point (Ho 1960: fig 5).

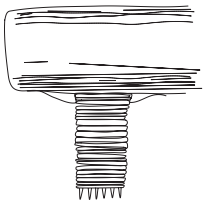

Figure 14. Taiwan
Atayal. Drawn from Ho (1960:46 & Fig 2) who described and illustrated multiple-thorn based tools.

The Philippines

The Philippines have great cultural diversity but records of traditional tattooing seem to be restricted to the use of simple implements. The Peabody Museum, Boston, has a Philippine tattooing implement (#74362) from Ifugao in Luzon with two straight-hafted thorns bound into the end of a bamboo shaft. The Bontoc Igarot men use 'four to ten commercial steel needles in a straight line in the end of a wooden handle' (Jenks 1905: 188). An angle-hafted tool is described by Salvadore-Amores (2002: 109) who interviewed the last of the traditional tattooists in Kalinga and was given his implements after he said he was no longer capable of doing the work. The handle is made from 'carabao horn (gisi), bent by fire with lemon thorns and/or four needles (gambang) attached at the tip'.

Thiel (1986: 243) illustrates four implements from Arku Cave, northeast Luzon made from horn or bone with three having serrated ends, 'that may be tattooing chisels'. The radiocarbon dates for the layer 2 deposit bearing these objects have a two-sigma range (GaK-7038) of 370 BC–AD 220. Thiel notes (1984–5: 122) that site disturbance from secondary burials meant it was not always possible to associate artefacts with a particular burial. Rather than being tattooing tools, the serrated Arku-type implement would be more suited to the incised striations in the decorative treatment of sherds such as those recovered from upper cultural layers of the Nagsabaran site in northern Luzon reported by Cheng-Hwa Tsang (2007: 82, & Fig 3) and dated to around 2,300–1,300 BP. The red-slip pottery bearing distinctive dentate stamp decoration from lower cultural levels with a basal date of 3,700 BP (Cheng-Hwa Tsang 2007: 83 & Fig 2) has simple linear designs showing the use of coarse stamps with blunt ended points that are familiar in the decoration of dentate stamped Lapita wares, as can be seen for example on the tooth impressions in sherds illustrated in Figure 7.

The distribution map (Figure 15) comparing thorn-spike tools with the manufactured bone tools of the Pacific Islands shows that from Taiwan and the Philippines to Indonesia, the regional source for pottery entering the 'Lapita Homeland' in the Bismarck Archipelago, the tattooing instrument of choice is based on natural points.

Indonesia

Early 20th century North Borneo tattooing practice observed by Rutter (1985: 119) describes the use of 'four to six needles lashed into a piece of bamboo'. Freeman (2009: 91) described Iban tattooing in operation where an angle–hafted 'instrument consisted of twelve needles tied to the end of a long stick, which the tattooer tapped rapidly with a heavier stick.' Krutak (2007: chap. 2) reviewed Borneo tattooing and recorded that Dayak, Iban and Kayan traditionally used angle-hafted thorns fixed with a wad of resin to the handle. Apart from the Iban, women were the

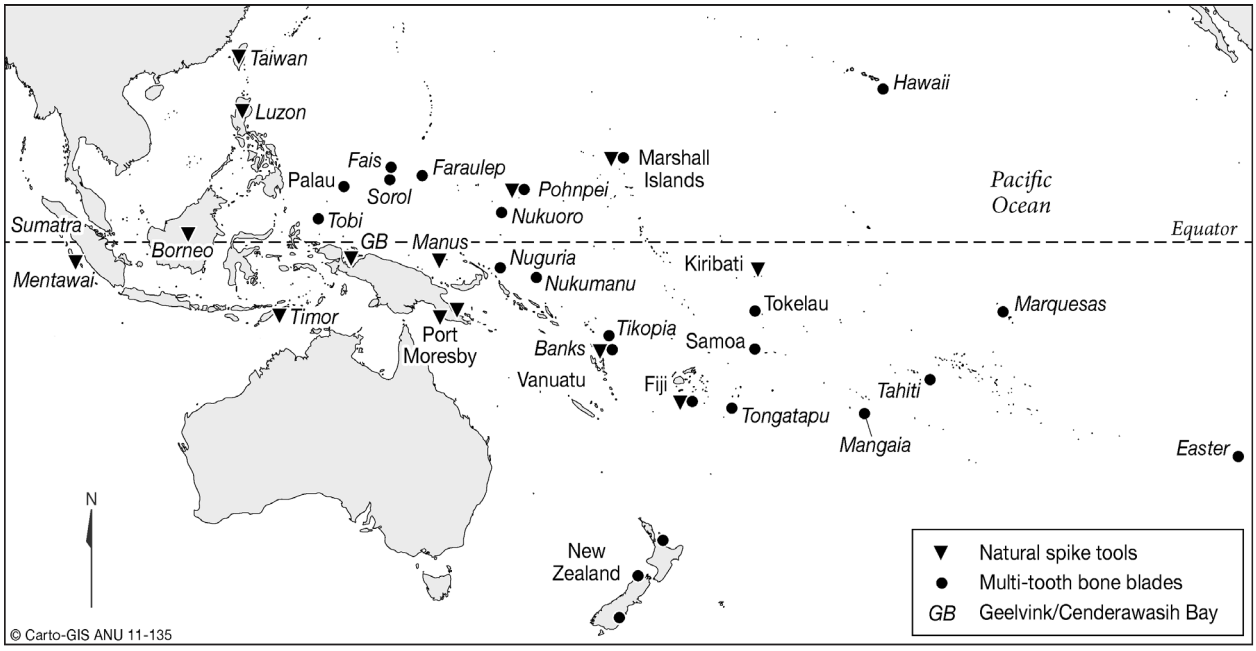

Figure 15. Distribution map. There is a separate distribution in the ethnographically described tattooing tools between natural spikes and manufactured blades. Natural spike-based tools dominate tattooing practice in Island Southeast Asia, extending through what would be known as the 'Lapita Homeland' in the New Guinea, Bismarck Archipelago region, and to Vanuatu and Fiji. The bone-based tools extend from Tobi Island in Micronesia to Easter Island in Polynesia. There is no support for a connection between multi-tooth blade tattooing implements and Lapita stamp technology in this distribution.

skilled practitioners for tattooing on both men and women. Interestingly Krutak likens many of the tattoo designs to those on prestigious fabrics produced by women. Dinter (2007: 221) provides photographs of tattooing operations for Iban and Kayan and from the Mentawai islanders off the coast of Sumatra from where he illustrates five angle-hafted tools each with a single thorn. Two have the thorns mounted at the distal end of the handle shafts, while three have thorns almost equidistant between the shaft end and an enlarged handgrip. One of the tools with a midway thorn has an ornamental shaft extension that curves upward to a right angle.

Vroklage (1952: 468) describes tattooing on Timor. The Belu of central Timor use a thorn to puncture the design that has been set out using dense black nut oil. This is a technique used also in eastern coastal Papua New Guinea.

g) Melanesia (Southwestern Pacific)

The Admiralty Islands

The westernmost reported Lapita pottery evidence is from Manus Islands (Kennedy 1981; McEldowney and Ballard 1991). Moseley (1877: 401) visited Nares Harbour, northwest Manus Island in 1875 and reported that the men were mostly marked by burn cicatrices, whereas tattooing was universally present on the women. The tattoo was made up of a series of short lines or cuts probably made with obsidian flakes. Spry (1878: 225) simply refers to both sexes in Nares Harbour having their shoulders and arms roughly tattooed. Permanent skin ornamentation on Manus was produced by repeated parallel cuts of about 5 mm with an obsidian flake, with or without the addition of pigment rubbed into the wound to produce a permanent mark. Glowing pieces of coconut shell were applied to produce burn cicatrice designs on Manus Island (Bühler 1935: 15). Miklukho Maklai (MS,78) was tattooed in Loniu Village in 1877 where he described both men and women who were tattooed with slivers of obsidian. He remarked that the tattooing was not done with pricked points as in Micronesia (MS,70) and included burn scars, and scars caused by rubbing some substance into a wound. Miklukho Maklai (MS, 92) describes almost all the women in the Hermit Islands, west of Manus, as being beautifully tattooed with long thin cuts probably made with slivers of glass.

Later publications reported skin puncture tattooing with an implement having several fish bones angle-hafted to the handle (Nevermann 1934: 93, Ohnemus 1998: 115), in a manner similar to that of the Waropen of Geelvink Bay (Held 1957: 27). The Manus Islands are a relatively isolated island group where the use of repeated skin incisions, burns, irritant induced scars and natural spikes to produce tattoo patterns is typical of other Melanesian groups. There are no recorded bone one-piece multi-pointed tat-

tooing implements that could be analogous to Lapita dentate stamp tools either archaeologically or ethnographically from the Manus archipelago.

New Ireland and New Britain

Despite Finch's view (1893:28) that tattooing was unknown in New Ireland, Stephan and Graebner (1907:42) described tattooing in southwest New Ireland in a manner similar to that in Manus, with sharp stone flakes, glass or mussel shell and the introduction of soot into the wound. Raised scar designs were also used. In New Britain body marking was similarly done with a sharp sliver of obsidian used repetitively to cut small 2–3 mm incisions in a parallel series to produce a scar band that had candlenut (*Aleurites* spp.) soot rubbed in as a permanent colourant. Parkinson (1907:137) regarded the practice as arriving in New Britain from southern New Ireland where the Siara used the same technique and where he recorded the term 'tatau.' It is not clear how this Polynesian name was introduced, but Thilenius (1903:124) reported an example of a man from Guadalcanal in the Solomon Islands with tattoo typical of Blanche Bay, New Britain, who had worked in Samoa and that it was not surprising that tattooing was occasionally found that is typical of other regions from New Ireland, New Britain or Polynesia, or that, implicitly, it was accompanied by the terminology.

New Guinea

In 1940, Held (1957:27) in Geelvink Bay, coastal West Papua, reported the non-ritual tattooing of young women during the years of puberty. Women were generally regarded as the specialists but Held believed that anyone wishing to take on the task was able to do so. The designs were first marked out in black colourant on the chest, legs and arms. This was followed by puncturing the tattoo pattern 'by means of two fish-bones, tied close together to a couple of pieces of wood, which are softly tapped with another piece of wood. Then the small wounds are rubbed again with blacking so that they become slightly inflamed, with the result that the motif is indelibly fixed in the skin'. This system closely matches the Motu and Collingwood Bay procedure at the eastern end of New Guinea where plant spines are used. Höltker (1968:10, 11) refers to tattooing, as with the Hula, east from Port Moresby, who use thorns and also to scarification, as being widespread from the coast to the hinterland where scar tissue is promoted by adding irritants to a cut or burn wound. Skin adornment implements can be split bamboo, bamboo knives, obsidian flakes, the edge of a hot mussel shells, and sharp stone flakes. Miklouchо-Maclay in 1872 (1975:166) reported scarification with small pieces of burning bark and hot stones being used on men and women on the Rai Coast.

The simplest spiked tattooing implement is illustrated in the Edge Partington lithographs (1890: II, 113) from SE coastal New Guinea where a twig is the handle for a thorn in growth position. (Figure 16). Barton (1918) gives a detailed record of the terms, imagery and traditional stories attached to tattoo along an approximately 350 km stretch of the coast from Waima west of Port Moresby to Mailu Island to the east, and to Collingwood Bay centred on Wanigela and Uaka on the northeast coast. Tattooing with a single thorn attached to a wooden shaft was widely reported (Caley-Webster 1898:249, Finsch 1893:89, Miklouchо-Maclay [1871] 1982:398). Miklouchо-Maclay (ms:190) describes his own tattoo by expert women in Karepuna Village where 'a small stick...on the end of which was left a sharp thorn', was tapped into a painted design on his skin. From the earliest records to contemporary reports only women have been tattooists (Barton 1918:22, Barker and Tientjen 1990). The method consists of painting the desired patterns on the recipient's skin with a black pigment made from a mixture of water and soot collected on a pottery sherd from burning tree gum, followed by tapping the thorn into the pattern marked out on the skin. Among the Managalasi from the inland Mountain Koiari, a close male family member tattooed boys as an age-based operation. A thorn angle-hafted to a flexible shaft was used. Close male relatives also tattooed girls (Noble 1978:908). At the time of his visit, tattooing had been largely neglected for at least 35 years, but some children had tattooed themselves on the forearm with little or no importance for either the tattooists or the children doing their own designs.

The discovery of an extensive Lapita site on the Papua New Guinea mainland South Coast at Caution Bay (McNiven *et al.* 2011) is in a region where the ethnographically described tattooing implements are all based on natural spikes. Pottery manufacture continued in the immediate area of the Lapita settlement from 2900 cal BP up to the ethnographic present.

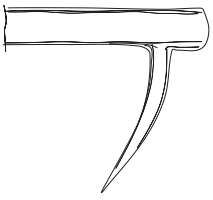

Figure 16. Papua New Guinea
Port Moresby, Motu. Redrawn wild orange twig with thorn illustrated by Edge Partington (1890) as New Guinea (11):80. Figure 3, from a collection in the Free Library and Museum Reading. Edge Partington refers to several specimens in the Liverpool Museum. Finch (1893:90, Fig 8) illustrates the same tool type made from a thorn in growth position on its twig cut to length as a handle.

Solomon Islands

Codrington (1891: 237) reported that a man skilled in the art on Florida Island did the tattooing at great expense to the recipient's family. The pattern was marked out in circles with bamboo and the skin was cut with the bone of a bat's wing. The tattooing was done to a young woman at a special pre-marriage occasion and accompanied by payment of much money, pigs and food to the tattooing expert. Guppy (1887: 135) observed tattooing practices on St. Christoval, Santa Anna, Bougainville Straits and Malaita that exhibited variations in the application and pigmentation of the designs. Curiously, Guppy described tattoo without colourant where, on St Christoval and adjacent islands, people had their cheeks marked with shallow grooves producing designs hardly differing from their general skin colour. The tools employed on Santa Anna included abrading the skin with a piece of shell, the sharp edge of bamboo, the tooth of a flying fox, and even long finger nails. Guppy noted that the most prevalent skin ornamentation was the raised burn cicatrice, also seen on the south and southwest coast of New Guinea and in the Admiralty Islands.

Vanuatu

Bonnemaison *et al.* (1996: Fig 12 and Fig 73) reproduces two drawings of tattooed women from Vanua Lava made by Miklukho-Maklai in 1879 where the designs appear to have been made with small cuts. Codrington (1891: 240) cited instances of tattooing in northern Vanuatu, as part of a girl's betrothal rites. Speiser (1990: plate 42) illustrated a side-hafted array of citrus thorns from NE Santo, a side-hafted bone tool with three teeth from Gaua in the Banks Islands, and a single side-hafted tool with three citrus thorns from Aoba (Figure 17). Scarification was illustrated (plate 41) from Banks Islands and Santo. Speiser (1913: 251 and photograph) described tattooing on Aoba Island as being done mostly on women by well-paid women who used an angle-hafted tool with three orange thorns. Only the wealthy could afford to have women tattooed 'all over' according to Speiser.

New Caledonia

Since the original Lapita site 13 was excavated and gave its name to the ceramics (Gifford & Shutler 1965), no archaeological site in New Caledonia has produced artefacts that could be seen as dentate stamps or multiple point tattoo implements. Sand (2010: 226), by juxtaposing a dentate stamped 'labyrinth' design on pottery and Samoan tattooing implements is continuing a conventional view in suggesting that such a connection does exist between the two. New Caledonia appears to be in the same tradition of archipelagos to its west where scarification is the norm. Anderson (1880: 220) referred to tattoo marks on the chin and near the mouth, while cutting and burning patterns made on the arm 'is a popular fancy with the women.' Sarasin (1929: 174) described both tattoo and scarification designs on women and burn scars on a boy.

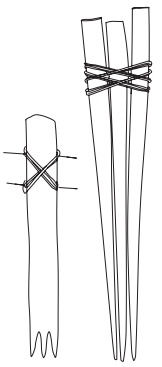

Figure 17. Vanuatu
Gaua- Santo- Aoba. Adapted from Speiser (1990: plate 42) who illustrates three different tattooing tools. One side-hafted bone blade from Gaua, blade length ~26 mm, and two thorn mounted implements. One tool from north-eastern Santo has three bound thorns ~48 mm long, and another from Aoba where the orange thorn is bound with fibre into a long shaft that in turn is angle-hafted to a wooden handle.

Fiji

This circum-Pacific survey of tattooing implements that began in Easter Island ends in Fiji. Along with Tonga and Samoa, Fiji is at the eastern margin of Lapita colonisation. There are reports of both bone blade and natural spike tattooing implements in Fiji, as in Micronesia. Spry (1878: 152) gives some details of tattooing from his visit to Kadavu Island where 'the skin is punctured with an instrument made of bone, or with the spines of the shaddock tree; whilst the dye injected into the punctures is obtained chiefly from the candle-nut'. Urban (1965) illustrates three tattooing implements ascribed to Fiji without further information; one appears to fit the description of Spry as being made of a group of thorns bound at an angle to the end of the handle (Figure 18). Best (2002: 69) summarises evidence from several authors for the importance of citrus (*Citrus grandis*) on ceremonial, burial and sacrificial occasions in Fiji. The use of citrus thorns for tattooing could therefore be more than a simple functional matter. The ethnographic record shows that Fiji is a significant eastern boundary in the southwest Pacific for the cultural practice of tattooing with natural spikes. In addition, from Fiji to the west in Island Melanesia and Island Southeast Asia both women and men are tattoo operators. In Central and Eastern Polynesia the tattooists are exclusively men. Fiji, despite its connections to Tonga subscribed to the western tradition.

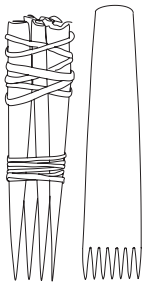

Figure 18. Fiji
Drawing adapted from Urban (1965) who illustrates multiple-thorn angle hafted tools 'from Fiji'. Spry (1878: 152) describes bone and thorn tattooing tools from Kandavu.

SUMMARY AND CONCLUSIONS

The general ethnographic picture appears to be as follows. The simplest natural spike tattooing tools are found in a broad area including Taiwan, Philippines, Indonesia and the coastal 'Lapita corridor', of island Melanesia, while thorn implements are reported in Pohnpei, Marshall Islands, and Kiribati. These plant and fish bone tools could be regarded as disposable compared with the manufactured toothed bone blades that are confined to Polynesia and Micronesia. The simplest manufactured blades are seen in Hawaii, the Marquesas, Rapa Nui, Micronesia, Fiji and late New Zealand, the group from the Polynesian outliers and the Lapita context in Tonga. The composite wide Tahitian form requires a mirror-matched pair of blades that are joined through perforations at their edges and fixed at their apexes to the handle. The Cook Islands Mangaia tattooing kit is very similar to early New Zealand forms with wide blade tools having a perforation for fibre binding, as well as simpler narrow blades. In New Zealand longer narrow blades became the dominant form. Although the narrow blade version matches the Easter Island and Hawaiian tools these differ in having some of their blades directly imbedded into the handle, or attached at a distance from the handle end. The most complex tattooing tools are found ethnographically in Samoa and Tonga where sets of short rectangular blades are bound and fixed to a backing plate of tortoise shell for attachment to the handle at the shell's apex. These modular tools can be assembled to provide a large number of points or narrow single blade versions. The widespread single narrow blades and simple plant thorns or fish spines may be fixed to a lightweight reed or disposable handle. But the handle shafts of single thorn implements used by the Mentawai, Indonesia, are quite elaborate in manufacture and form. Wider blades require more permanent attachment to the handle and permanent handle shafts may be especially made for the task as an integral part of the implement kit, along with a striking baton.

Manufactured bone tattoo blades in the Polynesian outliers west of Fiji are relatively late introductions to the Melanesian area where cutting tools, plant thorns and fish spines are the norm. Thorn puncture implements have a discontinuous presence in eastern Micronesia possibly as a result of complex multiple influences from the east, south and west. The presence of simple, tabular, toothed tattooing blades in the Marshall Islands, Pohnpei, and through the Caroline Islands to Palau, may represent relatively late introductions that displaced a more universal natural spike tool. Without archaeological evidence, however, it is not possible to determine whether the tabular bone tattooing implements common to Polynesia were derived from an early Micronesian innovation. A related question may be whether the toothed tattooing blade was inspired by the innovative dentate stamp technique itself, now reported for Nagsabaran pottery (Cheng-Hwa Tsang 2007: 83), in which case a Palau introduction to the Pacific may be contemplated, but the difficulty with this is the persistence to the present of natural or metal spikes as tattooing tools throughout Island South East Asia. Sand (2007: 267) in referring to the Nagsabaran pottery points out that only straight-line dentate stamps were used so that 'The absence of curved stamps on these pots may indicate that the transfer of the tattooing methods to clay was not [as] straight forward as often advocated… '.

Conclusions

Perpetuating a superficial claim for the primacy of tattooing over dentate stamp Lapita pottery ornamentation hinders a broader analysis of these two separate activities. By analysing their technological affinities as discrete entities it is possible to find wider connections, and examine deeper chronological ties. Only one excavation in Tonga, of more than 200 reported Lapita pottery-bearing sites, has a claim to tattooing blades. The change from spikes to tattooing blades appears to have occurred in central Polynesia and was possibly coincident with the demise of dentate stamp pottery designs. On present evidence the multi-toothed bone blade was an innovation that became an essential item in the development of Oceanic tattooing as it developed to its greatest complexity with the multiple blades of Tonga, Samoa and Tahiti. The Caroline Islands Tobi and Palau are the western extremity of the toothed tattoo blade innovation. It is absent from Taiwan, the Philippines and other parts of Island Southeast Asia. In the Lapita staging area of the Bismarck Archipelago, the most likely tool used by women for skin puncture tattoo, would be a plant thorn, fish spike or a single pointed bone, none of which are matched by the dentate stamps used to decorate the pottery. The designs themselves are more likely to be inspired by high value plaited and ornamented textiles and these could have a wider source that includes archipelagos to the west of the Bismarck 'Lapita homeland'. Finally the use of the innovative, toothed, bone tattooing blades could

be an idea transferred from the earlier technological innovation of Lapita dentate stamping in central Polynesia.

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