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Trans-oceanic transfer of bark-cloth technology from South China–Southeast Asia to Mesoamerica?

Judith Cameron

Department of Archaeology and Natural History, Australian National University, Australia
judith.cameron@anu.edu.au

Introduction

Scholars have long recognised the important role bark cloth plays in articulating status in Polynesian societies. In life (and death), Polynesian chiefs were traditionally presented (or shrouded) with copious quantities of bark cloth, the precise number of strips contingent on status. The considerable economic expenditure required to produce such large quantities reflects the significance of this item of material culture in its cultural context, as well as the importance of hierarchy in traditional Polynesian societies. Kleinschmidt's unforgettable drawing (Figure 1) of a Fijian chief wearing more than 180 m of tapa during a ceremony to mark the conclusion of 100 days of mourning for a paramount chief captures this symbolism dramatically.

It is therefore fitting that on his retirement, we honour our Polynesian colleague (archaeologist and chief) by symbolically presenting him with paper through this festschrift. From a technological perspective, bark cloth and paper are not markedly different, but they represent different stages of production. Both are produced by beating plant fibres; paper simply requires additional pounding and softening to completely macerate the fibres. Chinese historical documents indicate that bark-cloth production was abandoned in the early dynastic period when paper was invented; greater returns could be obtained from the processing of paper and clothing made from woven bast fibres (Shih Sheng-Han 1961). Elsewhere, I have demonstrated firm parallels between prehistoric bark-cloth beaters from Neolithic sites in southeast China and prehistoric bark-cloth beaters from mainland and Island Southeast Asian contexts (Cameron 2006). This chapter extends this typological reconstruction to Mesoamerica, which suggests the possibility of pre-Columbian contact long before bark-cloth technology diffused into the Pacific.

South China

The earliest archaeological evidence for bark-cloth production is from coastal Neolithic sites in the Pearl River delta region of southeast China (Figure 2). During the 1985 excavations,



Figure 1. Kleinschmidt's depiction of bark cloth worn by a chief of Viti Levu at a ceremony (from Kooijman 1972:436).

archaeologists from the Shenzhen Museum (1990, 1991) recovered 14 stone beaters in the basal layers of the site of Xiantouling. The first reports dated the site between c. 4500 and 3700 BC, but recent radiocarbon dates from the fifth season of excavations push the date back to 5000 BC (Shenzhen Museum 2007). The beaters were not isolated finds; the same tool types were recovered from an additional 10 archaeological sites in the region, including the site of Dahuangsha, which has a calibrated radiocarbon age of 4680–3870 BC (Chan Hing-Wah in Shenzhen Museum 1993:Table 1). Not only are the Xiantouling finds the earliest bark-cloth beaters in the archaeological record, they also form the largest assemblage of prehistoric beaters found at a single site. The concentration of early forms in this region is significant from an 'origin' perspective, since the coastal Neolithic of South China has long been linked to early population movements into Island Southeast Asia (Chang 1964, 1977; Bellwood 1979; Higham 2003).

All of the Neolithic stone beaters from the Pearl River sites are distinguished by longitudinal grooves (1–2 cm in depth) carved on their surfaces. Some have parallel rows of grooves, while others have grooves intersecting at right angles and a few feature intersecting diagonal grooves.

Southeast Asia

Stone bark-cloth beaters have been recovered from many Neolithic sites in mainland and Island Southeast Asia. Figure 3 provides a typology of the basic types. All but one of the eight different types have been identified in Island Southeast Asia. Because of geographic proximity, the parallels between the beaters from South China and those from Southeast Asia have previously been interpreted as evidence for diffusion from South China, rather than independent invention (Cameron 2006).

Type 1

Despite their obvious ambiguity, ungrooved beaters with smooth surfaces are classified as Type I beaters in the typology. Such basic forms have been recovered from Neolithic sites in South China (Ling 1962), Taiwan (Ling 1962) and Cambodia (Levy 1943). In Taiwan, they were immediately identified as bark-cloth beaters because of their ethnographic parallels, and it is very likely that this basic type was used more widely than generally recognised, and perhaps it was a multi-functional tool.

Type II

Regional differences are clearly discernible in Type II forms. Distinguished by horned protuberances, Type II beaters are confined to archaeological contexts in a small group of

adjoining islands in Southeast Asia, such as Taiwan (Ling 1961), the Philippines (Beyer 1948) and Sulawesi (Stein Callenfels 1951), with surface finds from Borneo (Harrison 1964). Most are devoid of surface grooves, although a horned version with deep longitudinal grooves on its upper face was excavated from Ampah in Borneo (van Heekeren 1972:125).

Type III

Modifications of the basic pounder form include Type III beaters, which are elongated oval pebbles with grooves carved on the upper surface. Type III beaters first appear in South China in the middle layers of Xiantouling, which is dated c. 2900–2200 BC. They occur slightly later at Yuanshan sites in Taiwan (Chang 1989), the Batanes Islands (Bellwood and Dizon 2005) and Sabah (Chia 1979), with a similar form found in Thailand (Evans 1930).

Type IV

Type IV beaters are distinguished by rows of parallel grooves extending over the entire surface of the tool face, and this form has a different distribution pattern. Not only does this type occur at Neolithic sites in the Pearl River region, it is also found on Hong Kong islands (Chiu and Ward 1979; Meacham 1994), Vietnam (Ha Van Tan 1980) and Sulawesi (Stein Callenfels 1951; van Heekeren 1972) as early as 3000 BC.

Type V

Type V beaters differ from other forms in one important respect; while their surfaces have the same grooves that distinguish other types, the stone is hafted so the handle is incorporated into the implement itself. These beaters have a different distribution. The earliest handled Type V beaters are from Vietnam (Colani 1933; Ha van Tan 1979), where they are known as *ban dap*; they also occur as surface finds in Sabah (Harrison 1964:Plate XIII), the Philippines (Cameron In press) and Taiwan (Lien 1991). These appear to be prototypes for the handled wooden beaters widely used throughout Polynesia.

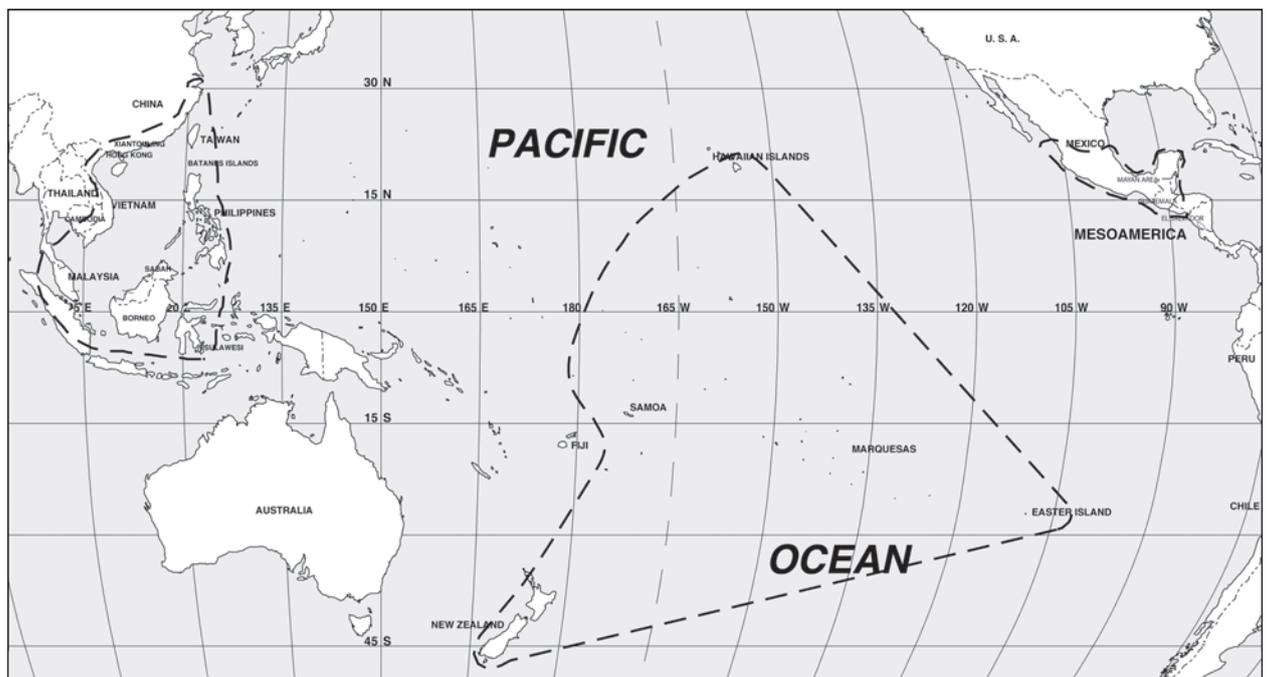


Figure 2. Location of Xiantouling and other early bark-cloth beater sites in Southeast China. Distribution of bark-cloth beaters in South China and Southeast Asia (left dotted line), Mesoamerica (right dotted line), and the Polynesian triangle (middle dotted line).

Type VI

A very different distribution pattern is discernible for the Type VI beaters, which differ from other forms in that they have three worked faces. This type first occurs at Neolithic sites in Vietnam, where they have been described as ‘small blocks of parallel elliptic schist with parallel lines on two opposed lateral faces while a big line goes through other faces’ (Ha Van Tan 1979:80). The Type VI beater would have been attached to a basketry handle; the hafted lateral surfaces ensure that the handle can be firmly fixed. Examples of the type have also been unearthed in Taiwan (Kano 1952:Plate 14) and the Philippines (Beyer 1948).

Type VII

Type VII beaters differ morphologically and functionally from other types. These beaters are effectively stone choppers with grooves on a rounded base. Known as the ‘Malay type’, they have been found in Thailand (Chiraporn Aranyanak 1991), Malaysia (Sieveking 1956) and the island of Borneo (Harrison 1964).

Mesoamerica

More than 100 years ago, the German anthropologist Max Uhle (1889–90) recognised parallels between prehistoric Mexican and Mayan bark-cloth beaters and bark-cloth beaters used by contemporary groups in Sulawesi. As well as using the same types of beater, the Maya used similar fibres and production techniques for making tunics, ceremonial clothing, banners and codices. The earliest bark-cloth beaters in Mesoamerica come from sites in the Maya area and its periphery, particularly along the coasts of Guatemala and El Salvador, where they first appear about 2500 years ago (Tolstoy 1961, 1991). The technology then moved westwards and eastwards from the Maya homeland. Tolstoy has long maintained that the above-mentioned parallels are the result of pre-Columbian contact with Southeast Asia, but Tolstoy’s proposition (and others based on different data sets) has been met with scepticism by archaeologists.

Tolstoy was not aware of the Chinese finds and we do not really know whether Tolstoy’s proposition can be extended to the Southern Chinese Neolithic. Two of the beater types in the typology (Figure 3) are represented at Mesoamerican sites. The modifications of basic pounders (Type III beaters) first appear c. 2500 BC at Xiantouling (South China), then in Taiwan, the Philippines and Sabah. The elongated oval pebbles with grooves carved on the upper surface (Type IV) first appear in South China in the middle layers of Xiantouling that are dated 2900–2200 BC, then later in the Hong Kong islands, Fu Tei Wan (Meacham 1994:40) and Man Kok Tsui (Chui and Ward 1979:89), the Yuanshan layers in Taiwan (Chang 1989), Sabah (Chia 1997) and Sulawesi (Stein Callenfels 1951; van Heekeren 1972) as early as 3000 BC.

Discussion and conclusion

Typological reconstructions are based on the premise that similarities in artefact form are the result of a shared mental template. My earlier typological study demonstrated this with Southern Chinese and Southeast Asian bark-cloth beaters (Cameron 2006). For this reason, the unequivocal parallels between prehistoric bark-cloth beaters from China, Southeast Asia and Mesoamerica outlined in this paper could also be interpreted as evidence for shared origins. However, there are problems with such an interpretation. If bark-cloth technology diffused to Mesoamerica during the prehistoric period, where is the intermediate evidence? How do we explain the absence of stone bark-cloth beaters in archaeological (and ethnographic contexts) in Polynesia? Fragments of bark cloth have been excavated from archaeological sites in Tonga (Davidson 1969) and French Polynesia (Suggs 1961), but stone bark-cloth beaters have not

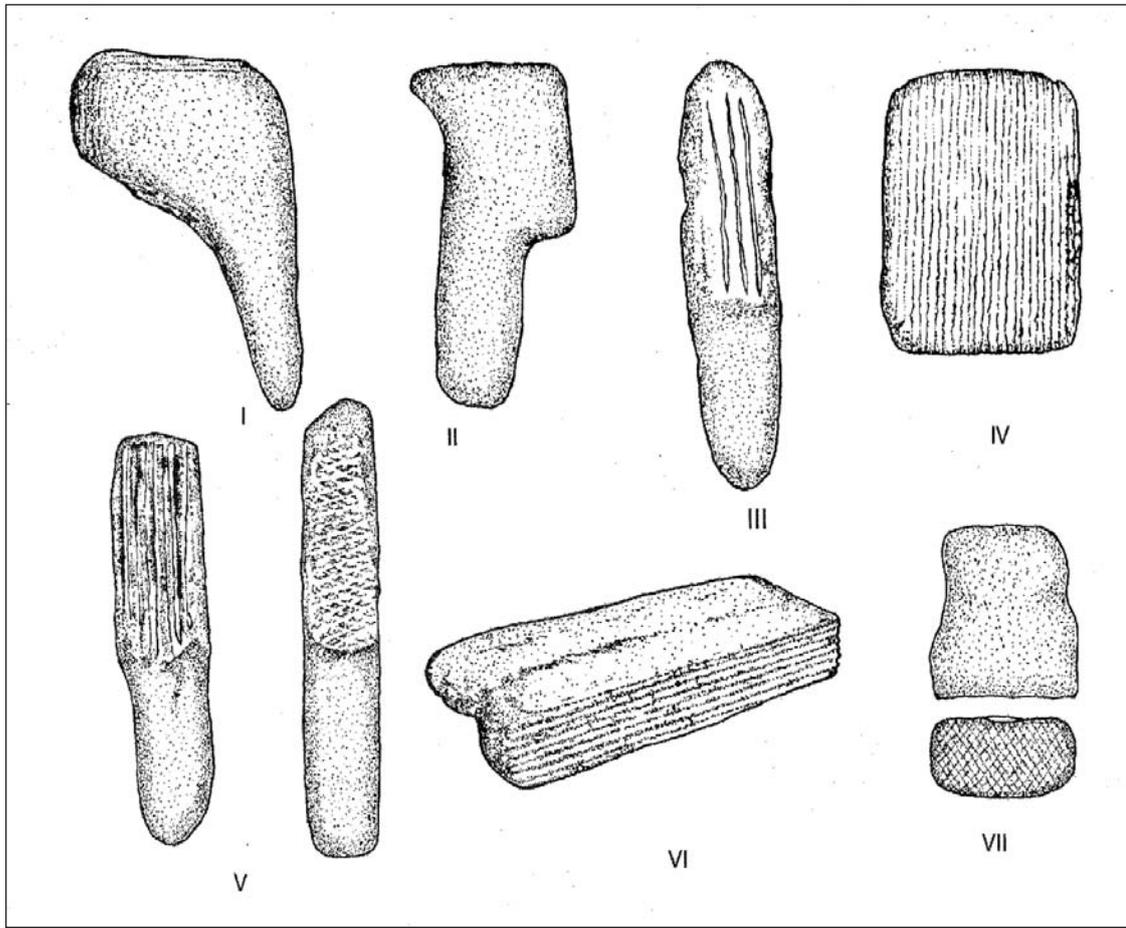


Figure 3. Typology of prehistoric bark-cloth beaters from South China and Southeast Asia (from Cameron 2006).

been reported. One plausible explanation for this absence comes from the anthropologist Tolstoy (1963, 1991), who rejects any notion that the tapa of Polynesia provides a credible link between Southeast Asia and Mesoamerica, and he argues instead that bark-cloth technology was introduced into Mesoamerica, not island to island, but in a single voyage sailing north of Hawaii along an island-less route to Mesoamerica.

Notwithstanding the above-mentioned parallels, there is also the possibility that the Mesoamerican archaeological bark-cloth beaters belong to an independent cultural tradition that has no links with Southeast China or Southeast Asia. Although the Southern Chinese and Southeast Asian beaters suggest interaction, parallels are neither necessarily nor exclusively resultant from interaction. An alternative explanation is that prehistoric groups in Mesoamerica independently developed stone bark-cloth beaters. In manufacturing material culture, there is a limited range of raw materials and there could be geological reasons, such as an abundance of river-smoothed pebbles of appropriate size and weight in both regions. The diagnostic features of the beaters in the typology might also be purely functional, rather than stylistic. Grooves on the faces of beaters enhance the maceration of bark fibres and prehistoric groups in Mesoamerica could have realised this quite independently. In the same way, prehistoric groups with hafted beaters on the two continents could have invented hafting independently, as groups in other parts of the world have done.

Some of the questions raised in this paper warrant further investigation, not the least being the absence of stone bark-cloth beaters in the Polynesian archaeological record. Although stone

beaters have never been identified, it is significant that the ungrooved beaters classified as Type 1 beaters in my typology are widely distributed at Polynesian sites, where they are identified as pounders. Certainly, these are ambiguous artefacts, and their function might be determined through residue analysis.

Further research into the factors influencing the material composition of contemporary Polynesian beaters is needed. There is evidence to indicate that choice was not environmentally determined. For example, in Tonga, where bark cloth is made daily, women use wooden beaters despite having access to volcanic stone (Geoff Clark pers comm.).

A technological explanation for the use of wooden beaters in Polynesia seems plausible. By the time the Pacific was colonised, bark-cloth production had been practised for millennia. While Neolithic groups would certainly have used plants such as *Broussonetia* sp. for their bark cloth, domestication was only in its initial stages during the Neolithic, and it is reasonable to assume that food-producing plants would have been domesticated first. By the time the Polynesians colonised the Pacific, knowledge of agronomy was more advanced and cultivation practices better developed. Young cultivated plants harvested annually do not require as much maceration as tougher, older fibre-producing plants, and wooden beaters would suffice. Craft production is also inextricably linked to social changes in prehistoric societies. As societies become more complex, elites use prestige goods to display status. When the Polynesians moved into the remote Pacific, the role of bark cloth as a semiotic system would almost certainly have been established, and control over the production, distribution and consumption of high-quality bark cloth would have enabled chiefs to attract, maintain and increase followers.

Finally, diffusionist paradigms linking China with Mesoamerica are not new and the list of material-culture parallels, best documented by Joseph Needham and Gwei-Djen Lu (1984), is extraordinary. Nevertheless, there is no compelling evidence that the parallels between Mesoamerican, Southeast Asian and Chinese bark-cloth beaters outlined in this paper are the result of Neolithic trans-oceanic movement. The available evidence suggests Neolithic groups from the two regions simply came up with the same solution to a technological problem. While Needham's other material-culture parallels are unequivocal, there are such temporal differences between them and the beaters that it seems far more likely they relate to a later period when trade and exchange would have been well established.

Endnote

The term bark cloth is generally used for felted bark fibres, produced through the application of moisture, heat and pressure, and does not include unbeaten bark sewn into clothing. Bark cloth is produced by beating the inner bark of certain trees and shrubs after the fibres have been softened through soaking or boiling. Fibres from the *Moraceae* family (*Antiaris* spp., *Artocarpus* spp., *Ficus* spp.) are best suited to the process because of the natural interlacing of their internal structures, while *Broussonetia papyrifera* (paper mulberry) produces the softest and finest cloth. Strips of bark are pounded with beaters to bond them together and increase the area and thickness of the material. This combined soaking and beating causes the superimposed strips to adhere to each other in a process called felting.

Acknowledgments

This research is funded by the Australian Research Council and supported by the Australian National University. The typology (Figure 3) draws from a classification produced by Ling Shun-Sheng (1962), but differs from it in several important respects. In terms of classification, Ling showed a propensity to clump, whereas the writer would be described as a ‘splitter’. This typology also differs markedly in scope, including the Shenzhen Museum data (not known in the 1960s) and Vietnamese data. I am indebted to the anonymous reviewers whose comments greatly improved the paper.

References

- Aranyanak Chiraporn 1991. *Archaeological Textiles in Thailand*. Bangkok: Fine Arts Department.
- Bellwood, P. 1979. *Man's Conquest of the Pacific*. New York: Oxford University Press.
- Bellwood, P. and E. Dizon 2005. The Batanes Archaeological Project and the “Out of Taiwan” Hypothesis for Austronesian Dispersal. *Journal of Austronesian Studies* 1(1):1–35.
- Beyer, H.O. 1948. *Philippine and East Asian Archaeology, and its relation to the origin of the Pacific Islands Population*. National Research Council of the Philippines: Quzon City.
- Cameron, J. 2006. The Origins of bark cloth production in Southeast Asia. In M. Howard (ed), *Bark Cloth in Southeast Asia*, pp. 65–74. Bangkok: White Lotus Press.
- Cameron, J. In press. Report on the bark cloth beater from the Linaminan Site, Palawan. In K. Szabo, the Linaminan Site, Palawan. *Hukay*.
- Chau Hing-wah 1994. Periodization of Prehistoric Culture of Pearl River delta. In Shenzhen Museum (ed), *Archaeological Discoveries and Research in Shenzhen*, pp. 54–62. Beijing: Cultural Relics Publishing House (in Chinese).
- Chang, K-C. 1964. Prehistoric and early historic horizons and tradition in South China. *Current Anthropology* 5:335, 368–75, 399–400.
- Chang, K-C. 1989. Taiwan Archaeology in Pacific Perspective. In Kuang-chou Li, Kwang-chih Chang, A. Wolf and Chien-chung Yin (eds), *Anthropological Studies of the Taiwan Area: Accomplishments and Prospects*, pp. 87–97. Taipei: The National Taiwan University.
- Chia, S. 1997. *The Prehistory of Bukit Tengkorak as a major pottery making site in Southeast Asia*. Unpublished PhD thesis, Universiti Sains Malaysia, Penang.
- Chiu, T.N. and V. Ward 1979. A Bark-cloth Beater? *Journal of the Hong Kong Archaeological Society* 7:98.
- Colani, M. 1933. Céramique, procédés anciens de décoration: Racquettes de potiers en schiste. *Bulletin de l'Ecole Française d'Extrême-Orient* 33 (1933):349–354.
- Davidson, J. 1969. Archaeological excavations in two burial mounds at ‘Atele’, Tongatapu. *Records of the Auckland Institute and Museum* 6:251–286.
- Evans, H. 1930. Stone objects from Surat, Peninsular Siam. *Man* 30:157–160.
- Ha Van Tan 1980. *Về những cái gỏi lá ban đap trong các di chỉ văn hóa Phung Nguyen*. In *Những Phát Hiện Mới Về Khảo Cổ Học Nam*, pp. 52–54. Hanoi: Viện Khảo Cổ Học (in Vietnamese).
- Harrison, T. 1964. Bark-cloth beaters from Sabah, Sarawak and Kalimantan. *Sarawak Museum Journal* 11:597–602.
- Heekeren, H. R. van 1972. *The Stone Age of Indonesia*, Second edition. The Hague: Martinus Nijhoff.
- Higham, C. 2003. Southern China and Southeast Asia during the Neolithic. In *Prehistoric Archaeology of South China and Southeast Asia. Proceedings of the International Conference to celebrate the 30th anniversary of the excavation of Zengpiyan*, pp. 23–39. Beijing: Cultural Relics Publishing House.
- Holbé T.V. 1915. Quelques mots sur les préhistorique Indochinois à propos des objets recueillis par M. de Pray. *Bulletin des Amis du Vert Hué*, 2^{ème} année 43 (in French).

- Kooijman, S. 1972. *Tapa in Polynesia*. Bishop Museum Press, Honolulu, Hawaii.
- Levy, P. 1943. *Recherches prehistoriques dans la region de Mlu Prei (Cambodge)*. Hanoi: Imprimerie d'Extreme-Orient (in French).
- Lien, C. 1991. *Excavations of the Peinan site. Vol.3*. Taipei: University of Taipei.
- Ling Shun-sheng 1962. Bark cloth culture and the invention of paper-making in Ancient China. *Bulletin of the Institute of Ethnology, Academia Sinica* 11(1961):29–50.
- Meacham, W. 1994. *Fu Tei Wan: Archaeological Investigations of Chep Lap Kok Island*. Hong Kong: Hong Kong Archaeological Society.
- Needham, J. and Gwei-Djen Lu 1984. *Trans-Pacific echoes and resonances: listening once again*. Singapore: World Scientific.
- Shenzhen Museum 1990. The Preliminary report of the excavation at Xiantouling. *Wenwu* 2:1–11 (in Chinese).
- Shenzhen Museum 1991. *Archaeological Finds from the Pearl River delta in Guangdong, China*. Hong Kong: Chinese University of Hong Kong (in Chinese).
- Shenzhen Museum 1994. *Archaeological Discoveries and Research in Shenzhen*. Beijing: Cultural Relics Publishing House (in Chinese).
- Shenzhen Museum 2007. Neolithic site at Xiantouling in Shenzhen City, Guangdong. *Kaogu* 7:9–16.
- Shih Sheng-Han 1961. *Chhi-Min Yao-Shu Hsuan Tu-Pen (Selections from the Chhi Min Yao Shu)*. Shanghai (in Chinese).
- Sieveling, G. de G. 1954. Excavations of Gua Cha, Kelantan. *Federation Museums Journal* 1–2:75–143.
- Stein Callenfels, P. V. van 1951. Prehistoric sites on the Karama River. *Journal of East Asiatic Studies* 1(1957):77–97.
- Suggs, R.C. 1961. *The Archaeology of Nuka Hiva, Marquesas Islands, French Polynesia*. Anthropological Papers of the American Museum of Natural History 49(1).
- Tolstoy, P. 1963. Cultural parallels between Southeast Asia and Mesoamerica in the Manufacture of Bark-cloth. *Transactions of the New York Academy of Sciences* 25:646–662.
- Tolstoy, P. 1991. Paper Route. *Natural History* 100:6.
- Uhle, M. 1889–90. *Kultur und industrie Sudamerikanischer Volker Leipzig Museum fur Volkerkunde*. Berlin: A. Ascher.