

From Field to Museum Studies from Melanesia in Honour of Robin Torrence

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Cannibalism and Developments to Socio-Political Systems from 540 BP in the Massim Islands of south-east Papua New Guinea

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ABSTRACT. The consumption of human flesh, popularly defined as cannibalism, has arguably occurred throughout much of human history. In New Guinea, it has been associated ethnographically with warfare, mortuary rites and nutrition. However, it often evades detection in the archaeological record because of difficulties in distinguishing it from other social practices. Here we disentangle colonial myths associated with the consumption of human flesh and report disarticulated, burnt and cut human skeletal remains from two coastal sites spanning the past 540 years in the Massim island region of southeast Papua New Guinea. These sites, Wule and Morpa, both occur on Rossel Island. The skeletal evidence is contemporary with the construction of large stone platforms where human victims were often killed and consumed, and inland villages which were established in response to a well-attested period of conflict on Rossel and throughout the region. Within an ethnoarchaeological framework, we argue that cannibalism became increasingly prevalent in association with feasting as a means of maintaining social relationships and personal power. The findings are placed first within an island, then a regional model of emerging pressures on existing socio-political systems.

Introduction

Cannibalism—popularly but narrowly defined as eating the flesh of another person—has long been a subject of macabre fascination among public audiences because of its association with primitive behaviour (Kilgour, 1998). Yet, the consumption of human flesh has occurred globally throughout much of human history, and for reasons other than the acquisition of food (Fernandez-Jalvo *et al.*, 1999; Andrews and Fernandez-Jalvo, 2003; Boulestin *et al.*, 2009; Defleur and Desclaux, 2019). In most archaeological studies the social and psychological factors which make it a functionally useful practice are poorly defined, although

economical, religious, and political motivations are often elicited (Villa, 1992; Conklin, 1995; Metcalf, 1987; Degusta, 2000). In the Pacific region, disarticulated, burnt and cut human bone have been attributed to cannibalism. However, the possible social implications are rarely discussed in detail (Kirch, 1984: 159; Poulsen, 1987: 250; Spennemann, 1987; Barber, 1992; Rechtman, 1992; Rieth, 1998; Degusta, 1999, 2000; Steadman *et al.*, 2000; Bedford, 2006: 228; Pietruszewsky *et al.*, 2007; Stodder and Reith, 2011). In large part, this is due to uncertainty in attributing skeletal evidence to disarticulation and cooking rather than to some other explanation, and likely also for fear of misrepresentation (Poulsen, 1987; Villa *et al.*, 1986; Vilaca, 2000; Carbonell

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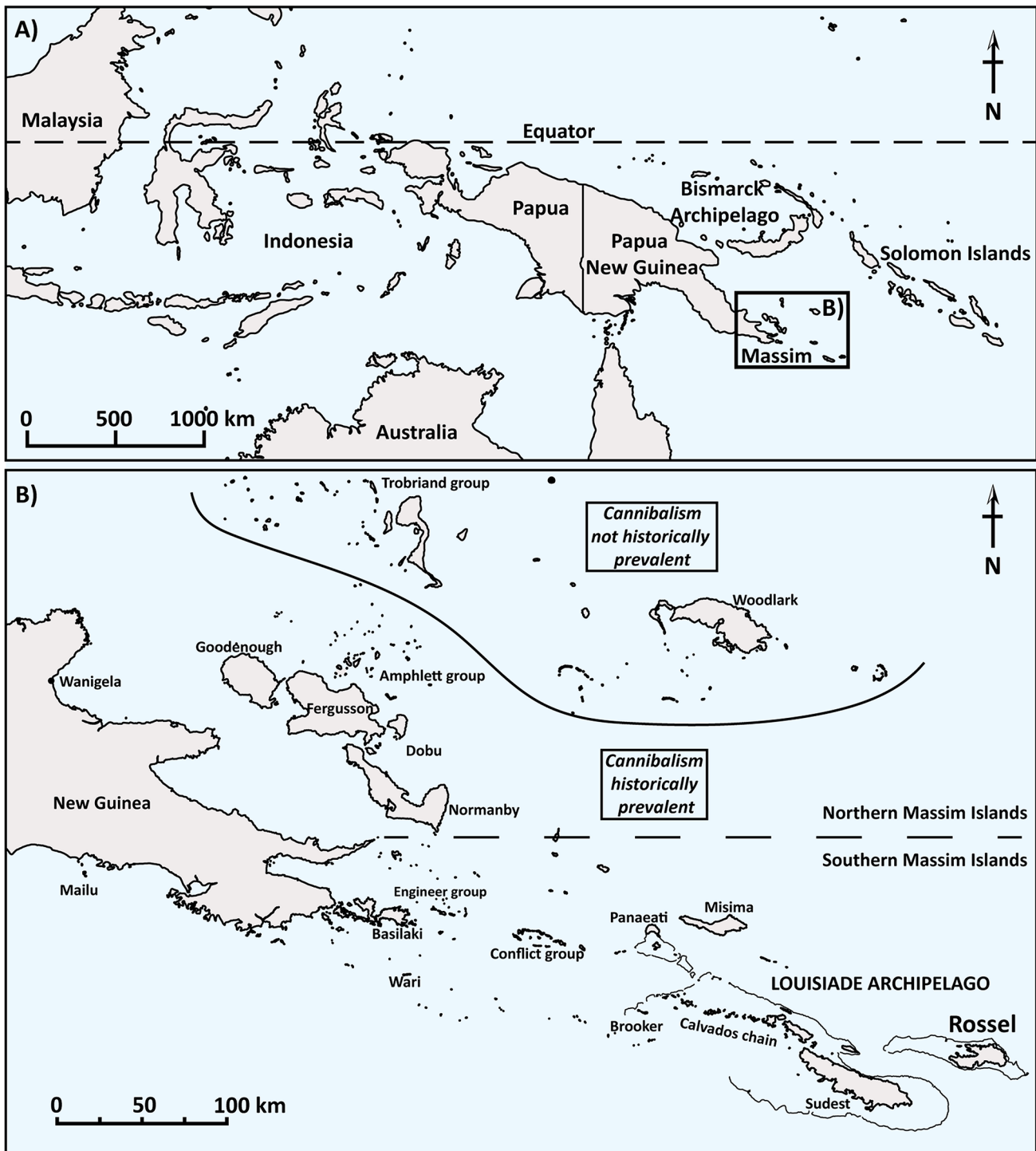


Figure 1. (A) Map of the Indo-Pacific region, showing the location of the Massim islands. (B) Location of Rossel Island within the Massim.

et al., 2010; Bello *et al.*, 2016).

In this paper burnt and cut human skeletal remains recovered from excavations on Rossel Island in the Massim island region of Papua New Guinea (Fig. 1) are argued to reflect deliberate disarticulation and cooking. The Massim islands are well placed to investigate the significance of cannibalism in an archaeological context, because many detailed ethnographic descriptions of mortuary ritual, conflict and cannibalism are available and indicate that these activities continued until the recent past (Lee, 1912: 58–59; Malinowski, 1922: 27–28; Lepowsky, 1981; Macintyre, 1983: 138; Damon and Wagner, 1989; Liep, 2009: 82–84). Cranial and post-cranial skeletal remains from the Wule and Morpa sites span the past 540 years and were analysed within a comparative ethnoarchaeological framework, drawing

on anthropological accounts of cannibalism and mortuary practices from Rossel Island to interpret the excavated data. Cremation and deliberate bone destruction were excluded as explanations for the condition of the human bone because neither practice is known historically or archaeologically in the Massim.

Prior to colonial pacification on Rossel Island, mortuary feasts following the death of high-status individuals involved the killing, cooking and distribution of a victim from another clan to reinforce social relationships in a similar manner to the distribution of cooked pig meats. We argue that such cannibalism was ritualised, and its prevalence coincided with a significant shift in island social organisation when individual rivalries had intensified to maintain social control of a rapidly emerging inter-island trade market.

Separating colonial myth from indigenous reality

Cannibalism—both the word and its connotative meaning—is wholly a colonial construct (Sanborn, 1998). Identifying cannibalism is of limited interpretive value unless the reasons why it was practised can also be defined so that Eurocentric racial stereotypes can be avoided. Fortunately, 20th century ethnographers have increasingly viewed the practice from a culturally relative perspective which has highlighted a myriad of reasons why societies historically consumed human flesh (Villa, 1992; Turner and Turner, 1995; Kilgour, 1998; Rumsey, 1999). Identifying cannibalism archaeologically can therefore contribute significantly to the modelling of past social systems by contributing time and contextual dimensions to the practice.

Accounts of expeditions in New Guinea from as early as 1606 AD have inferred the prevalence of cannibalism among coastal, island and highland cultural groups (Rochas, 1861: 87; Chalmers, 1887: 62; Lindt, 1887; McFarlane, 1888: 15; Beaver, 1920; Booth, 1929; Hilder, 1980: 75). Presumed evidence for cannibalism was commonly based on human bones observed hanging in houses or villages (Moresby, 1876: 133; Lyne, 1885: 166; Thompson, 1890). These remains were often determined later to be the curated bones of ancestors displayed at the final stage of prolonged traditional mortuary practices, and in some cases, were the skulls of enemies.

Some researchers have argued that cannibalism has not been directly observed historically and cannot be distinguished from other social practices in the archaeological record (Arens, 1979; Bahn, 1992). However, systematic analyses of human skeletal remains have been successful in identifying cannibalism based on taphonomic markers (Villa, 1992; White, 1992; Turner and Turner, 1999). In New Guinea, Stodder and Reith (2011) analysed prehistoric skeletal remains from the Sepik region and further stressed that interpreting remains in a context of historically and archaeologically documented mortuary practices allowed regionally nuanced patterns of body treatment to be identified.

Identifying cannibalism in the archaeological record is culturally sensitive. It requires detailed consideration of indigenous perspectives on why and how it was undertaken. Despite the well-known limitations of constructing behavioural analogies based on historical sources (e.g., see Torrence, 2003) it remains the best heuristic means of making sociological sense of the distant past. Even though many historical observations of indigenous social institutions were made after extensive change resulting from the influence of missionaries, traders and government agents (Macintyre, 1995; Roscoe, 2000; Spriggs, 2008), these institutions have their own histories and evolutionary trajectories that can be identified archaeologically in relatable forms in earlier times.

A particularly relevant example of a Massim social institution transformed in the post-colonial era is the regionally networked Kula exchange system, first recorded in detail by Malinowski (1922). Archaeological analyses have indicated that the historic Kula had antecedent roots at least five centuries earlier (Egloff, 1978; Irwin *et al.*, 2019) and it has become increasingly evident that the level of complexity described by Malinowski was only made possible after government intervention ended endemic warfare at the turn of the 20th century (see also Swadling and Bence, 2016; Singh Uberoi, 1962).

Thus, the important question is how far back in time can we extend the historical accounts of Rossel Island

social systems and the role(s) of cannibalism within them? Comparatively little is known about Massim society before the late 19th century. However, recorded oral testimonies of local inhabitants have gone some way in explaining aspects of the more distant past, particularly cannibalism, mortuary ritual and conflict. Here we recognise that while these practices were relatively quick to change following colonial pacification, the underlying belief systems associated with them did not undergo the same rapid transformation (Liep, 1983). The rationale for cannibalism and potentially related practices is still well known in Rossel Island society. Archaeological records in the Massim and adjacent coastal regions within the past 500–1000 years are now also relatively well known. Modelling the data has shed further light on the time depth and transformations of historically known practices (Bulmer, 1982; Shaw, 2016a; Skelly and David, 2017; Allen, 2017). Skeletal evidence on Rossel can therefore be interpreted within a relatively detailed ethnoarchaeological framework.

The historical rationale for cannibalism in the Massim islands

To understand how cannibalism was articulated within Rossel society, here we model the similarities and differences of pre- and post-colonial cannibalism according to the rationales for this activity in the Massim. Prior to colonial pacification at the turn of the 20th century inter-island trading in the Massim was interspersed with violent raids. Occasionally this involved the capture of human victims for cannibalism and skull trophies, which became objects of exchange (Lepowsky, 1991; Moore, 1991; Macintyre, 1994; Liep, 2009: 32). On the islands of Dobu, Misima, Panaeati, the Calvados chain, and certainly others, all of which are close to each other, war leaders held an elevated status in their communities because of their perceived strength and ability to organise inter-island raids (Whiting, 1975; Berde, 1983; Kuehling, 2014). The frequency of raids intensified throughout the southern Massim in the 19th century. Attacks were often undertaken by groups from small impoverished islands because of increasing population pressure on land and access to resources. The relative isolation of Rossel from neighbouring islands—at least 33 km across a rough open sea passage—limits inter-island contact even in the present-day. Historically, inter-island raids from Rossel did not occur and thus were not an explanation for cannibalism.

Unlike the southern Massim, raiding and cannibalism was not widely practised in the northern islands (Seligmann, 1910: 7). However, symbolic tasting of decomposing flesh during mortuary rituals is reported to have occurred on the Trobriand Islands (Malinowski, 1929: 156). Venturi (2002) recorded long bones and skulls with cut and puncture marks in a Trobriand cave dating to < 540 cal. BP. Their association with large *Tridacna* sp. shells and pottery suggests these were likely secondary burials involving disarticulation (see Ollier and Holdsworth, 1969; Egloff, 1972). Nonetheless, disarticulation for other purposes before burial cannot be ruled out.

The most detailed overview of cannibalism in the Massim is provided by Seligmann (1910: 548–564), with aspects having since been confirmed, clarified and elaborated by others (Macintyre, 1995; Jenness and Ballantyne, 1920: 32–35; Roheim, 1954). Most cases were attributed to one of three reasons. The first was eating deceased relatives exhumed soon after burial, with the belief that the dead person in one form or another was regenerated through the transfer of substance or vitality to a living person.

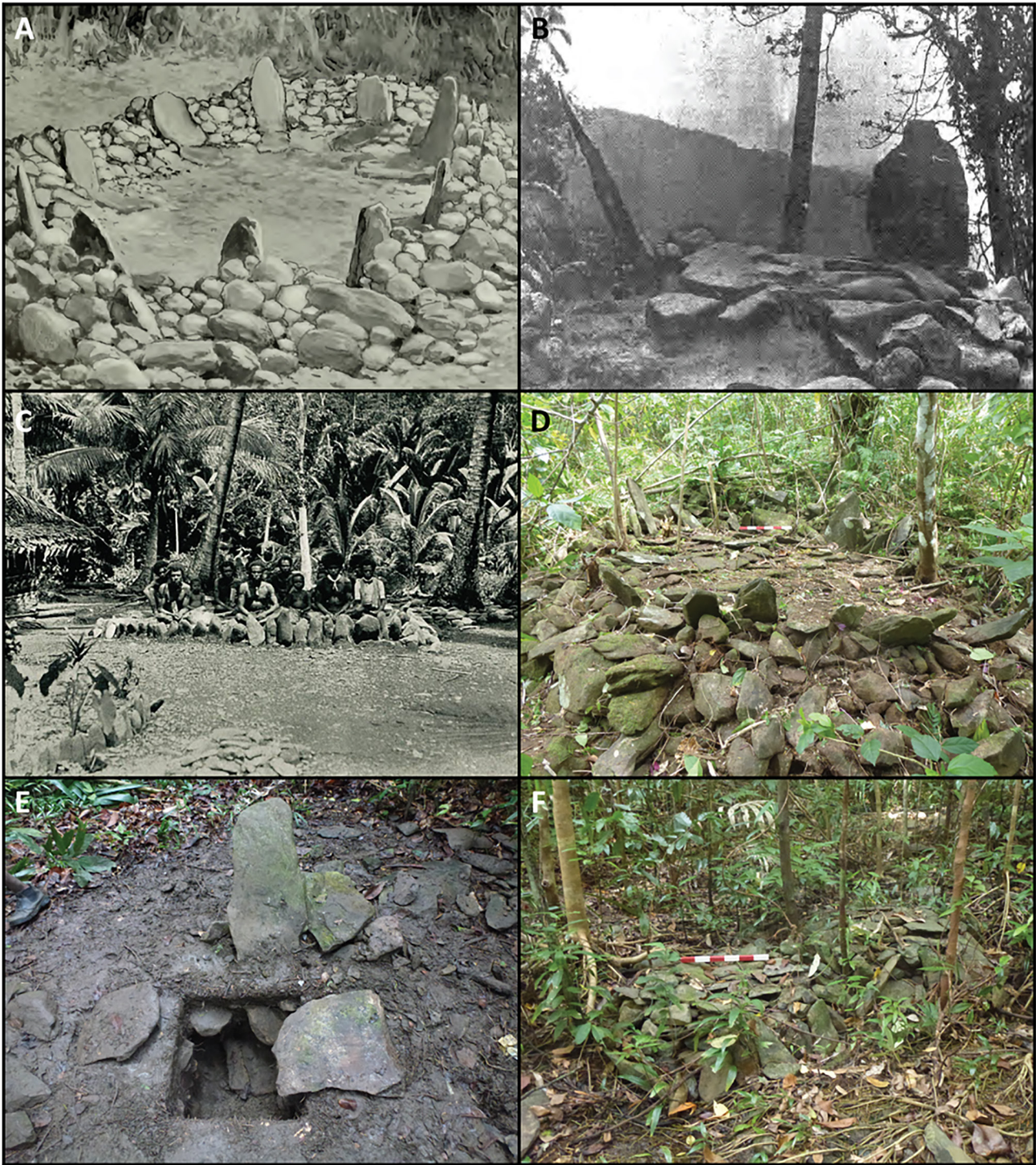


Figure 2. Stone structures associated with cannibal feasts in the Massim. (A) Stone circle (*gahana*) on Taupota Island, from Seligmann (1910: 465–466). (B) Stone platform on Goodenough Island, photo taken by Patrol Officer R. A. Vivian c. 1920 (Cochrane, 1986: 102). (C) Rossel Islanders sitting in a stone structure within their village, 1921 (Armstrong, 1928: 112–113). (D) Keyvu, platform with upright stones as part of a larger stone complex excavated by the lead author, Rossel Island in 2011. (E) Ndapa, paving and upright stone excavated by the lead author in 2012, Rossel Island. (F) Stones used in ground ovens to cook cannibal victims on NE Rossel Island.

Consumption of the recently-deceased was also seen as an act of piety or remembrance (Malinowski, 1929: 156). The second was for the pleasure of eating the flesh. ‘Nutritional cannibalism’ had also been reported in the Gulf region where human flesh was preferred over pig because of the superior flavour, and because stomach cramping or vomiting did not occur as frequently after excessive eating (Murray, 1933: 14; Seligmann, 1910: 552–553; Roheim, 1954). The best pieces of the body were reportedly the tongue, hands, feet, breasts, and the brain, which had to be extracted from the skull, with other parts needing to be disarticulated.

The third, and most prevalent reason was to avenge the death of a clan member that had occurred during a previous raid. The killing and eating of enemies were widely reported throughout New Guinea and was especially common in the Bismarck Archipelago, the island group to the north of the Massim (Parkinson, 1999: 203; Hahl, 1980: 86–87). Revenge killings and associated cannibalism in the Massim were typically organised events and planned well ahead of a raid (Young, 1971: 115). A raid could involve the taking of a targeted individual or a clan member from a related village. Cannibalism, therefore, occurred within an established

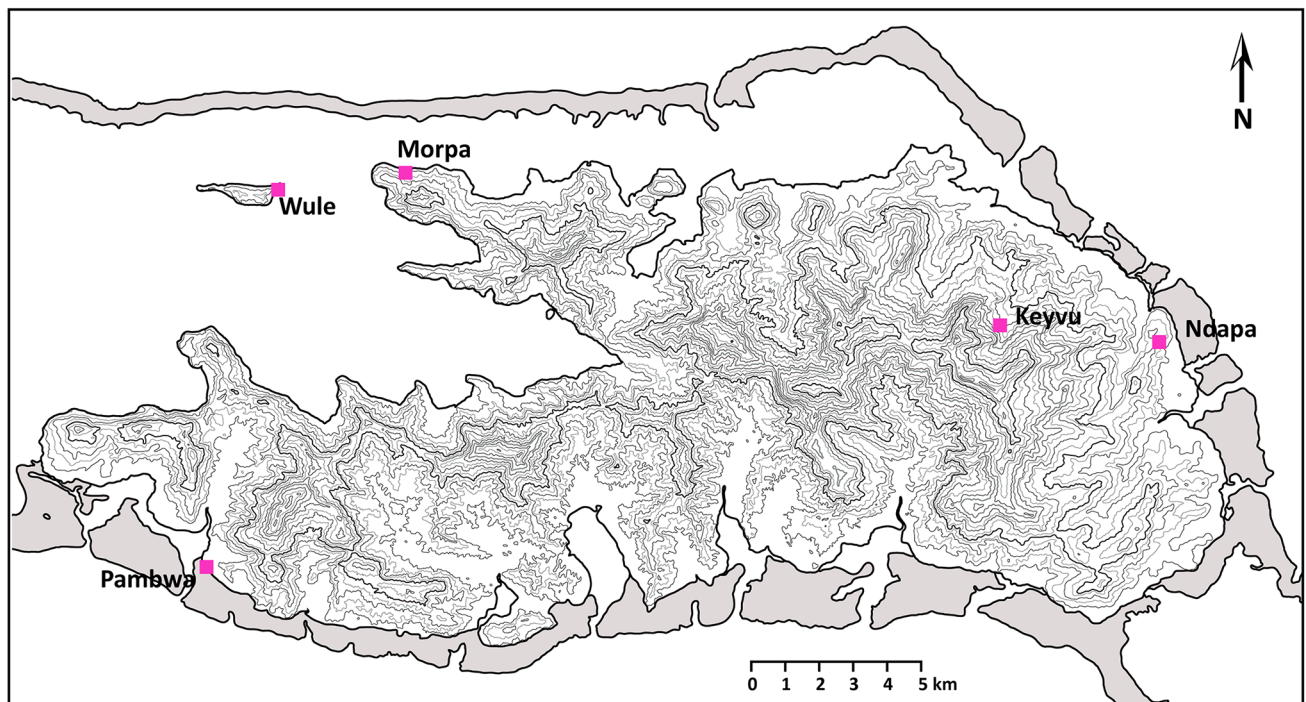


Figure 3. Rossel Island marked with sites mentioned in text.

context of island, clan, and familial organisation, which involved the preparation of a feast and payment of shell valuables and pigs to the individual who captured the victim.

Stone platforms and their connection to cannibalism

Stone circles were often the focal point of the feast where the victim was killed, cooked, dismembered, and distributed. These structures have been reported in several Massim island and mainland villages (Brass, 1959: 31) (Fig. 2a–c). Two stone platform complexes, Ndapa and Keyvu, closely associated with oral histories of cannibalism, were excavated on Rossel (Fig. 2d,e). Radiocarbon dating indicates Ndapa was built between 510 and 300 cal. BP (ANU 32531: 350 ± 60), and Keyvu within the past 290 years (ANU 25131: 165 ± 30 ; ANU 25130: 155 ± 30). The stone platforms therefore overlap in time with historically recorded accounts of cannibalism on the island. Stones used in ground ovens (*ntêmo*) to cook men and women victims separately are located only 500 m away from Ndapa on the same ridge as part of a broader ritual landscape connected with local deities (Liep, 2009: 77; Henderson and Henderson, 1999: 73) (Fig. 2f).

Keyvu was abandoned sometime after the 1920s when indigenous communities relocated to the coast as colonial contact became more frequent (Shaw, 2015, vol. 2: 46–54). A Rossel man, Ben Kwelu, was born at Keyvu around 1920 and witnessed his father participating in a cannibal ritual there when he was a young boy. This story provides a direct connection between the Keyvu stone platforms and cannibalism. In contrast to Rossel and the southern Massim, the larger megalithic structures on the northern islands of Trobriand and Woodlark, although known places of burial, have no demonstrated association with cannibalism. These are, however, several hundred years older (Ollier *et al.*, 1973; Bickler and Ivuyo, 2002).

Cannibalism, sorcery, feasting and leadership on Rossel Island

Rossel Island is infamously associated with cannibalism, at least in a historical context (Fig. 3). The earliest documented account was in 1793 when Captain John Hayes, during a brief visit to the island, observed human remains at the site of a feast (Lee, 1911: 588). In 1858 Rossel Island made global headlines after a French ship, the *St Paul*, was wrecked on the reef with more than 300 people left on board. They were killed and eaten over a period of three months (Rochas, 1861; Anderson, 2009). The event, although unusual in its magnitude, demonstrated that cannibalism was still practised in earnest in the mid-19th century. Less frequent instances have also been reported well into the first half of the 20th century (Moreton, 1905: 29; Murray, 1908: 15; Armstrong, 1928: 103–114; Shaw, 2015, vol. 2: 48–49). Oral histories attest that cannibalism was a relatively late development in Rossel society, introduced as the population grew and taboos were established to maintain ‘law’, with individuals killed and eaten as punishment for breaking those taboos (Shaw, 2015, vol. 1: 58–59).

The rationale for cannibalism on Rossel differed to other island communities in the Massim. It most often involved local victims rather than those from another island and was practised primarily as part of mortuary feasts following the death of a prominent individual. However, Armstrong (1928: 112) suspected that it also occurred under less formal conditions. Liep (1989) provides a concise account of the association of cannibalism with mortuary feasts, which corroborates and expands earlier descriptions by Moreton (1905: 29) and Armstrong (1928):

When a big man died a victim had to be procured for the mortuary feast. Usually the deceased’s relatives made strong allegations of sorcery, most often against affines of the deceased. To avoid being slain the suspected sorcerer must kill somebody else and take the body to the deceased’s village. The compensation paid to the victim’s relatives constituted the largest prestation in the Rossel prestige economy and involved the highest-ranking ndap shells and other valuables. The soliciting of valuables for the payment resulted in debts and replacements that probably took years to settle (Liep, 1989: 240–241).

To direct a person to be killed required considerable social power. This was held by only a few individuals on the island at any given time. In the case of a mortuary feast, discussions between leaders reportedly took place to decide who was to be killed and from what clan (Armstrong, 1928). Leadership on Rossel, like all Massim cultural groups except the Trobriand Islands, is not hereditary (Weiner, 1988). Authority is therefore temporary, limited in scope and always at risk if not continually reinforced (Lepowsky, 1991). Accruing status is almost entirely based on the ability to manipulate social relationships, to organise feasts and to accumulate high-value exchange items (greenstone axes, shell money, pigs, and ceremonial spatulas). The successful undertaking of a feast demonstrated the strength of the support given by other clans (Liep, 2007: 93). Population increase and mounting pressure on land resources in the centuries before colonial intervention may have led to the increased complexity of mortuary feasting, including the involvement of cannibalism (Liep, 1989).

No death on the island was considered natural no matter the individual's age, whether it be an infant or an older person, and in almost all cases, sorcery was the putative cause. Cannibalism on Rossel must therefore be understood with reference to Rossel belief systems concerning sorcery and in the context of clan organisation. For example, the killing of an individual might be understood as revenge for the murder of a family/clan member, but eating this individual could not be explained in the same way. Nor could the payment of high value shell money (*ndap*) to the victim's relatives, which burdened the killers with debts. Indeed, the distribution of food and the exchange of shell money at a feast is wholly aimed at forming and maintaining social relationships. In this context mortuary cannibalism can be understood as a social exchange in a similar way that a butchered and cooked pig is distributed at a feast to maintain such relationships.

Personhood in the Massim— a link to cannibalism

Consideration of personhood as a social construct in the Massim provides an important link in understanding why a killed individual is dismembered, cooked, distributed and consumed, rather than just killed. Unlike European perceptions of a person as an individual with inseparable qualities, in many Melanesian societies a person is considered as partible and dividual, defined by their social relations over a lifetime (Poole, 1984; Knauft, 1989; Wagner, 1991; Mosko, 1992, 2000; Strathern and Stewart, 1998). In the Massim, partible personhood is tangibly expressed through the exchange of objects such as ceremonial axes or spatulas and substances such as pig meat, blood and fat, which can have symbolic (metaphorical and metonymical) associations with a body part (Weiner, 1976; Strathern, 1988; Macintyre, 1984, 1995). In this respect, object exchange connects individuals in a delayed reciprocal relationship.

When a person dies on Rossel, the eating of food at the mortuary feast is equivalent to eating a lifetime of relationships. At Rossel funeral feasts, as in many Massim communities, objects and substances can therefore represent parts of a corpse (Liep, 1989; Battaglia, 1990: 190–191). These are exchanged with individuals who had a social relationship with the deceased as a means of regenerating or ending those connections (Battaglia, 1983; Damon and Wagner, 1989). Pigs are most often consumed because they represent social debt and require considerable investment of time and energy to rear, with a piglet often selected for

a feast several years beforehand (Macintyre, 1984; Liep, 2009: 259–282). The past practice of cannibalism would likely have functioned within the same social framework, with the consumption of an individual fulfilling similar social obligations as a pig for the means of reproducing social relationships.

Distinguishing cannibalism from other mortuary ritual and conflict

Outlining pre-colonial mortuary practices and conflict on Rossel Island assists in distinguishing between cannibalised and non-cannibalised disarticulated human skeletal remains found in an archaeological context. Fortunately, both practices have been documented in detail by several observers over a century and there is excellent consistency between them (MacGregor, 1894: 3–7; Bell, 1909: 103–109; Armstrong, 1928: 103–106; Liep, 1989). After a death on Rossel Island, the corpse was usually buried in a shallow grave under the house, and sometimes in a sitting or crouched position. After several months, the decomposed body was exhumed, and the bones cleaned by close relatives. The skull and long bones (arm/legs) were curated in the house, and after some years they were transferred to a rock-shelter in the bush. The trunk of the body was sometimes wrapped in a covering of sago leaves, lashed into the fork of a tree, and left until decomposition was complete.

The excavation of a primary burial at the Pambwa site (Fig. 4) documents a pre-colonial burial practice on Rossel Island, dating to between 510 and 310 cal. BP (ANU 33527: 370±35 BP). The skull or head had been removed after soft-tissue decomposition had commenced, as indicated by the disarticulated axis vertebra and 17 teeth that had fallen out when it was removed. Skull removal, as well as the body position (supine with crouched legs), are similar to historically documented mortuary accounts (Shaw, 2015, vol. 1: 358–371). Rat gnawing on the bones further suggests that the body was partially exposed in a shallow grave while still fleshed. A gnawed skull fragment also indicated that the skull may have been fractured when the victim was alive or at least when the skull was still fleshed, and that this injury may have been the cause of death.



Figure 4. Primary burial at Pambwa, Rossel Island, with evidence for secondary removal of the skull. Dentition remaining in the grave fill, where the head was, indicates skull removal took place after decomposition.

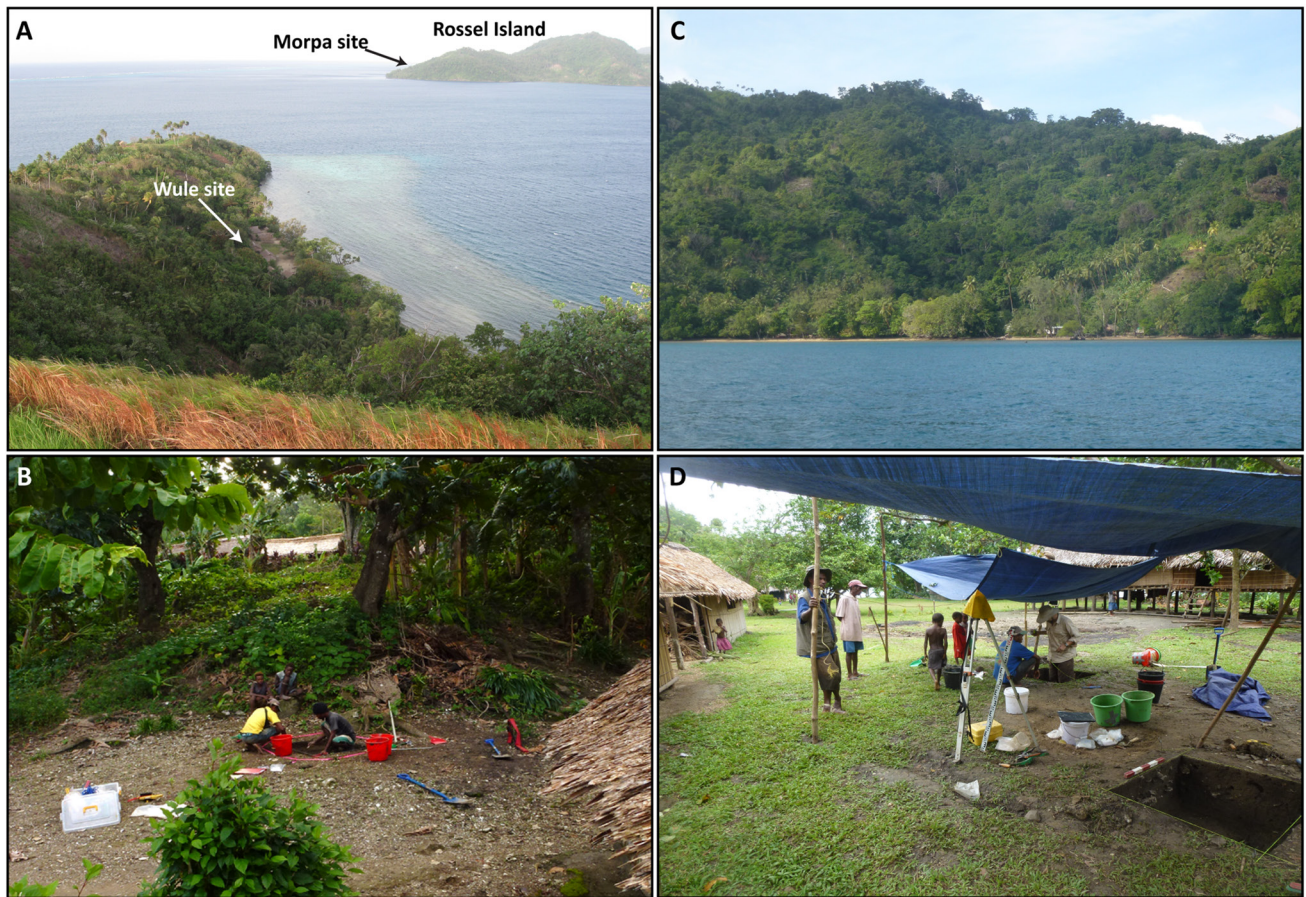


Figure 5. Wule and Morpa sites and environs. (A) Wule beachfront and bay. (B) Wule excavation on shell midden. (C) Morpa Bay. (D) Morpa excavation.

Pambwa residents considered it likely the individual was a cannibal victim as the body had been buried in a midden heap. They noted that skull removal occurred with both cannibal victims and deceased family members, but that additional long bone removal only occurred with the latter and not the former, as was the case here. Because the body was not disarticulated, they suggested that it was only buried rather than eaten because payment had not been made. Examples of this were known to the community.

Neither bodies nor skeletal remains in ethnographic or archaeologically documented mortuary contexts were smoked or burnt, nor were the bones deliberately cut or broken. Head-hunting was also not historically practised on the island. Murder was relatively common, but this was typically undertaken using a spear or by collapsing the rib cage and puncturing the lungs (Armstrong, 1928: 106). There are also no known instances on Rossel of endocannibalism—the consumption of a deceased individual by family members. Evidence of burning, cut marks, substantive fracturing, and representation of body parts favoured for eating might therefore be associated with exocannibalism—the consumption of an individual from outside of the immediate social/clan group, rather than as a direct mortuary ritual or as mutilation of an enemy.

Wule and Morpa site chronologies, skeletal remains and pottery

Two sites excavated on Rossel Island in 2012, Wule and Morpa, produced fragmented human skeletal remains with evidence consistent with disarticulation and cooking. Both sites were on the northwest side of the island, with Wule situated on a small offshore island of the same name within

the Rossel lagoon. At Wule 4 m² was excavated into a dense refuse midden deposit which had accumulated relatively rapidly between 540 and 290 cal. BP (ANU 32537: 440±30 BP; ANU 33525: 400±35 BP; ANU 32538: 286±22 BP) against the hillslope at the back of a narrow beachfront (Fig. 5a,b). At Morpa 3 m² was excavated into a buried cultural surface on a coastal flat and dated no earlier than 290 cal. BP (ANU 32533: 130±45 BP) (Fig. 5c,d).

Excavated pottery in the same context as the human skeletal remains was identified as Early-Middle Southern Massim Pottery (SMP) at Wule, and Late SMP at Morpa. On Rossel, Early SMP dates to 550–400 BP, Middle SMP to 400–200 BP and Late SMP to < 200 BP (Fig. 6). SMP has also been dated on several other islands in the Massim to the same age range, further confirming the antiquity of the skeletal remains (Irwin *et al.*, 2019; Shaw *et al.*, 2020). No pottery is made on Rossel Island, and pottery was only introduced to the island in large quantities c. 550 years ago (Shaw, 2016b). The Rossel population was drawn into regional trade at this time, probably to obtain high-quality shell necklaces (*bagi*) which are manufactured on Rossel and are a high-value exchange object throughout the Massim (Campbell, 1983). A transition from relatively shallow bowls in Early SMP to larger, open pots in Middle-Late SMP has been argued to reflect the increased use of pots in communal feasts where greater cooking volume was required (Fig. 6f,g) (Negishi, 2008; Shaw *et al.*, 2020; Shaw and Dickinson, 2017). Specifically, large pots with clay banding, most common in Late SMP, are typically used at modern feasts to present sago pudding as a prestige food item, as well as other foods (Liep, 2009: 68). Excavated pottery at Wule and Morpa, therefore, supports increased feasting in the past 400 years on Rossel and throughout the southern Massim.

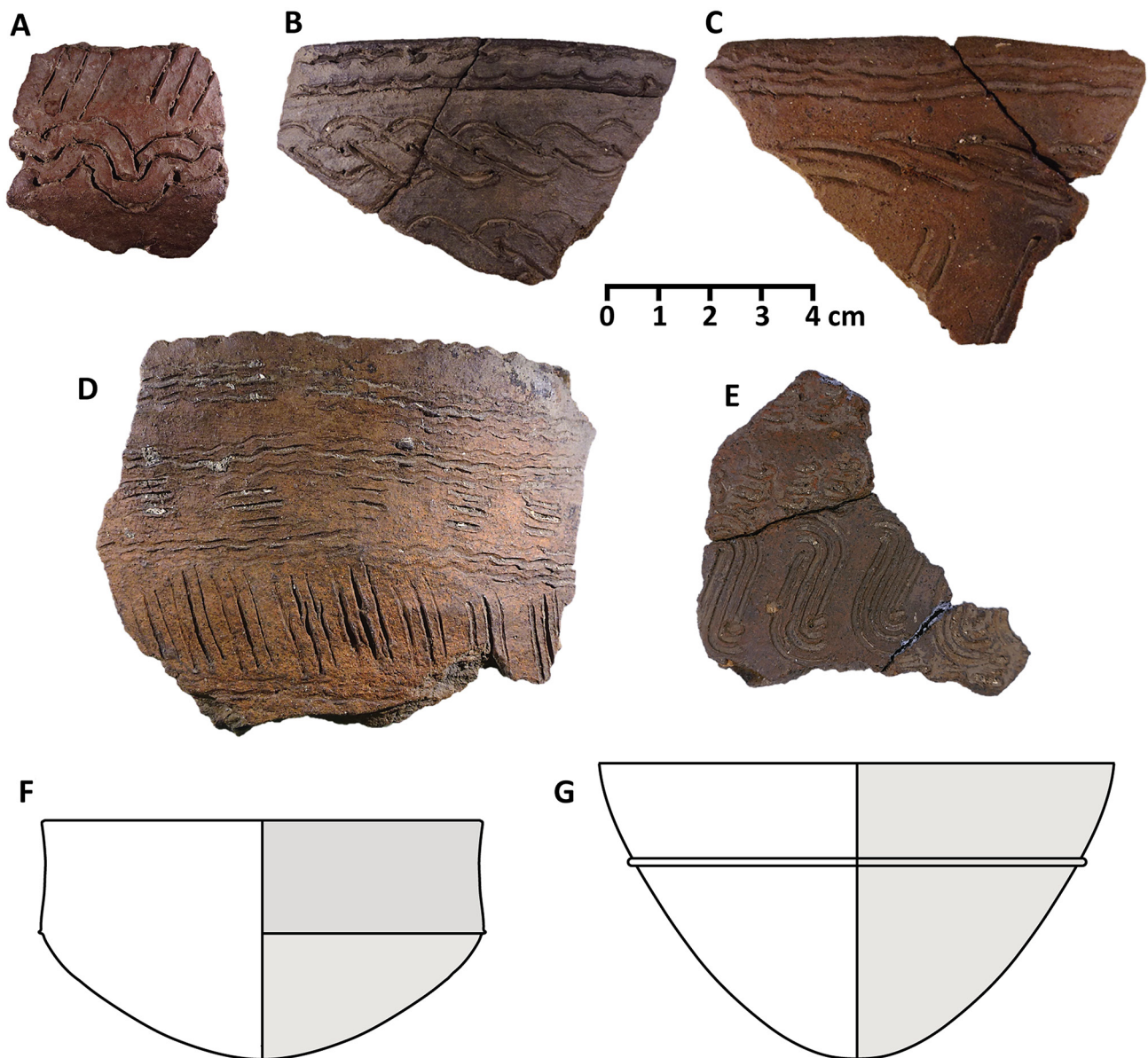


Figure 6. Southern Massim pottery recovered from Wule and Morpa. (A,B) Early SMP, Wule. (C) Middle SMP, Wule. (D,E) Late SMP, Morpa. (F) Early Southern Massim Pottery vessel. (G) Late SMP vessel with banding.

Skeletal remains

A partial mandible, three cranial fragments, a humeral and metatarsal shaft, and 12 human teeth were recovered from Wule, and clustered long bone fragments were recovered from Morpa (Table 1). The mandible had evidence of blunt force trauma to the ascending ramus, with cut marks on the medial aspect of the ramus suggesting deliberate breakage and defleshing (Fig. 7a). A humeral shaft had a large fracture resulting from direct blunt force trauma, with cut marks in several directions around the point of impact (Fig. 7b). The fracture was likely inflicted to extract marrow or to separate the upper limb from the torso.

Of the cranial fragments, one had charring on the interior and exterior surfaces with deep cut marks along the bone margin suggesting the direction of breakage was controlled and deliberate (Fig. 7c). The second was partially cut with weathering of the cut marks indicating they occurred after the skull had broken (Fig. 7d). The third fragment had extensive rat gnawing, but no anthropogenic modifications, indicating the fragment was discarded on the ground when it still contained flesh rather than having been interred. The metatarsal shaft fragment had both ends cut before discard

(Fig. 7e). The long bone fragments at Morpa had all been heavily burnt (Fig. 7f,g).

The blackened colour of the burnt human bone fragments at Wule and Morpa (Fig. 7c,f,g) indicates they had been exposed for a prolonged period to a relatively low-temperature fire. Bones take on a black appearance between 300 and 450°C as they undergo carbonisation and subsequently trend to white from 450–645°C during the calcination process (Correia, 1997; Shipman, 1984). The discolouration was identical to pig, fish and bird bone discarded as food refuse at these sites. The human bone had, therefore, likely also been cooked on a fire while fleshed and subsequently discarded as refuse.

The extent of occlusal wear of the teeth was used to estimate age following the method of Lovejoy (1985), and to estimate the number of individuals represented. No attempt was made to identify sex because of the highly fragmented nature of the remains. Of the 12 teeth, ten derived from the maxilla (Table 2). At least three individuals are represented at Wule as a conservative estimate, but as many as 4–6 individuals may be present based on relative tooth size. Most of the teeth ($n = 11$) trend in wear rates from sub-adult (12–18) through to young

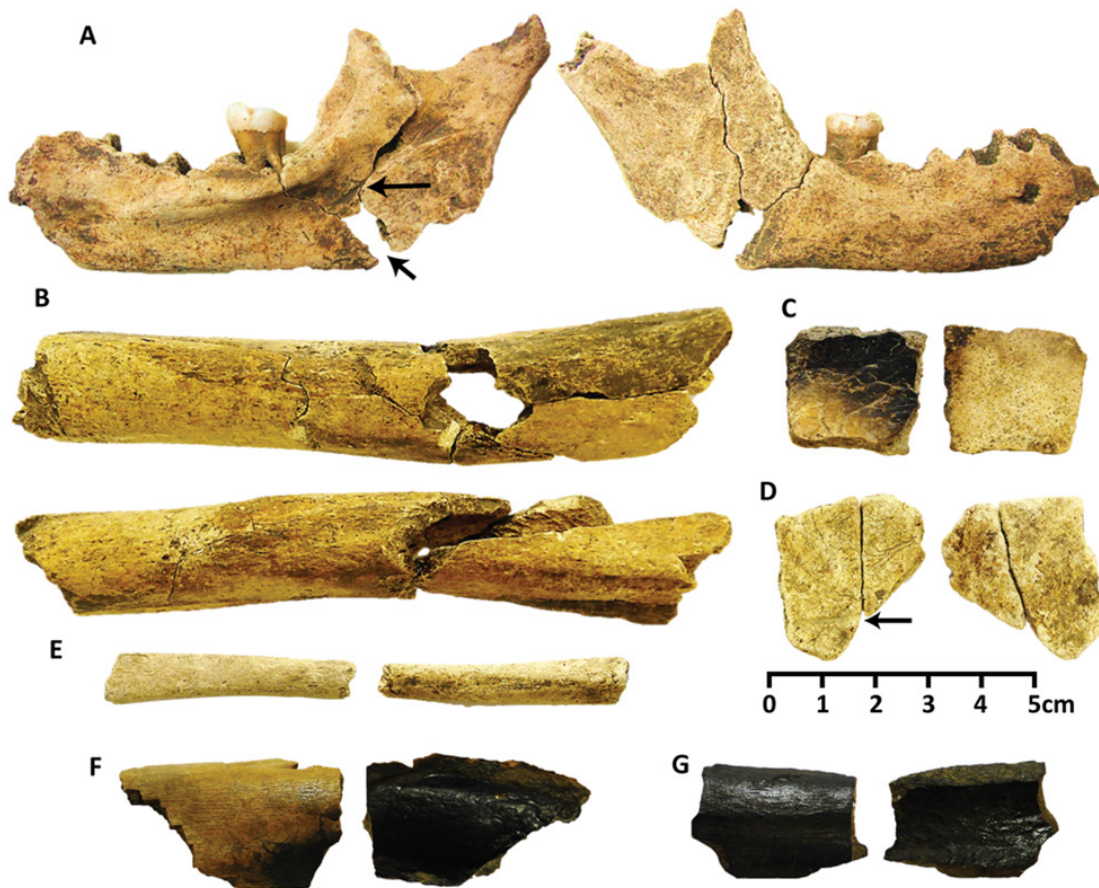


Figure 7. Human skeletal remains recovered from excavations at Wule and Morpa with evidence of cut marks, fractures, burning and gnawing. (A) Partial mandible with third molar, Wule, Unit D, Layer 3–4. (B) Fractured humeral shaft, Wule, Unit D, Layer 3–4. (C) Cranial fragment with a cut margin and burning on the interior and external surfaces, Wule, Unit B, Layer 4. (D) Cranial fragment with a cut mark on interior surface, Wule, Unit B, Layer 4. (E) Metatarsal shaft with cut marks and gnawing on the distal and proximal ends, Wule, Unit D, Layer 3–4. (F,G) Burnt long bone fragments, Morpa, Unit C, Layers 1–2.

adult (24–35), with at least two individuals represented to account for this range of wear (Fig. 8). A third individual was indicated by a third molar with advanced occlusal wear which re-fitted with the partial mandible (Fig. 7a). At Morpa, the skeletal fragments may have come from a single individual.

Discussion

Human skeletal evidence from Wule and Morpa is consistent with ethnographically documented occurrences of cannibalism. Secondary mortuary practices and interpersonal violence were ruled out archaeologically, suggesting cannibalism on Rossel Island had occurred at least within the past 540 years. Although earlier incidents are likely to have occurred, its coincident occurrence with the establishment of interior settlements and the use of stone platforms is probably significant. The excavated stone platforms at Ndapa and Keyvu, dating to within the past 510 years, are of central importance in Rossel oral history as they are associated with migrations of people into the interior of the island. The establishment of interior settlements occurred throughout the Massim and coastal New Guinea as raids on coastal villages by neighbouring groups became more commonplace (Lepowsky, 1983; Irwin, 1985; Bickler, 1998; Irwin *et al.*, 2019). On Rossel, there is a direct correlation between the demonstrated antiquity of cannibalism and the construction of stone platforms.

Regional and local influences

Southern Massim Pottery was introduced to Rossel en masse within the past 550 years and is linked to the increased frequency of inter-island trade, as well as the emergence of regional cultural identities (Shaw, 2016b). The impetus for trade seemingly occurred as a risk-reduction strategy between smaller, drought-prone islands in the Calvados chain and with islands closer to the New Guinea mainland following a prolonged period of reduced rainfall (Shaw *et al.*, 2020; Skelly and David, 2017). Trade may have occurred alongside instances of raiding in a way similar to that documented ethnographically (Liep, 2009; Macintyre, 1994; Moore, 1991; Lepowsky, 1991). During the past five or six centuries, Rossel Islanders were drawn into this regional trade network probably because they manufactured high-quality shell necklaces (bagi or soulava) that were sought after valuables in trade networks such as the Kula, operating elsewhere in the Massim (Shaw, 2016b).

While there is no archaeological evidence for Rossel having been in regular contact with neighbouring islands in the Massim prior to the introduction of pottery, conflict on the island between clan groups must have intensified enough to justify movement to inland villages. Once Rossel was incorporated into regional trade, the sites of Wule and Morpa were either established or inhabited more intensively because they are situated in coastal locations of great strategic importance. Both are located at the western end of Rossel where the populations could have engaged with

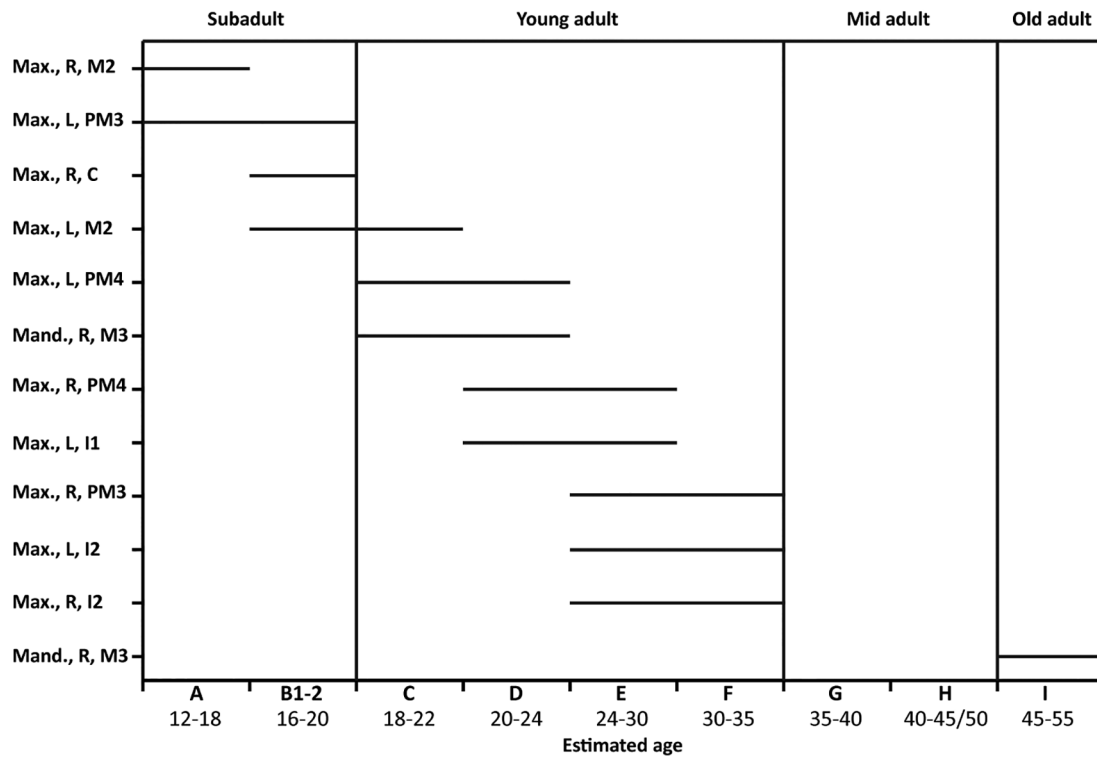


Figure 8. Estimated age based on dental wear of isolated teeth at Wule. At least three individuals are represented. Wear scores and age ranges after Lovejoy (1985). Age categories (Sub, young, mid and old) based on Buckley *et al.* (2008) for prehistoric Pacific Island human populations.

Table 1. Human skeletal remains recovered from the excavations on Rossel Island.

site	unit	spit	context	layer	element
Wule	B	6	sieve	4	cranial fragment
		7			cranial fragment
	D	3	in situ	3-4	humeral shaft
			in situ		cranial fragment
		4	sieve		metatarsal
	5	in situ	partial mandible		
Morpa	C	1	sieve	1-2	long bone fragments
	2				

Table 2. Human teeth recovered from excavation at Wule. Wear scores and age ranges after Lovejoy (1985).

unit	spit	layer	side	position	tooth	no.	wear score	estimated age
A	6	4	left	maxilla	premolar	PM4	C-D	18-24
			right			PM4	D-E	20-30
			left		incisor	I2	E-F	24-35
	8	5a	right		premolar	PM3	E-F	24-35
					incisor	I2	E-F	24-35
C	4	3	left		molar	M2	B-C	16-22
	7	4		incisor	I1	D-E	20-30	
	8			canine	C	B1-B2	16-20	
D	5	3/4	right	mandible	premolar	PM3	A-B	12-20
				maxilla	molar	M3	I	45-55
				mandible	molar	M2	A	12-18
				mandible	molar	M3	C-D	18-24

incoming trade canoes from neighbouring islands before they could travel further around the coast. Indeed, Wule is also one of the earliest Massim sites where Early SMP has been identified (Shaw, 2016b). Trade goods could therefore be re-distributed across the island from these western settlements. In sum, there are several lines of historical and archaeological evidence indicating that a significant disruption to social systems occurred on Rossel Island at this time.

Liep (1989: 235) argued that historically Rossel did not engage in trade to the degree that would tend to intensify food production for export and make agricultural resources the object of competition. While this may have been the case, increased inter-island trade, as indicated by the large scale introduction of pottery, and predominantly to the western end of the island, would have provided the necessary impetus for an intensification of local competition. If such competition was not for agricultural resources, it was necessary to secure access to land adjacent to sheltered harbours where canoes could be moored and external trade partners could be met (Shaw, 2016b). Distinct dialects are spoken on the western and eastern ends of the island with western communities having loan words from languages spoken on the neighbouring island of Sudest (Levinson, 2006). Such a division was likely created or at least exacerbated by increased external connections to western Rossel where the sites of Wule and Morpa are situated. The integration of Rossel communities into a more extensive and structurally complex regional socio-political system could, therefore, have enabled some populations to acquire control over the movement of people, goods, and information. Controlling this market would then allow individuals to enhance their social status and to dominate other groups (Liep, 1989: 233).

Cannibalism and a connection to mortuary contexts

It is within this context that cannibalism on Rossel Island can be linked to mortuary rites, the consumption of individuals from neighbouring clans (exocannibalism), and the maintenance of social control following the death of a prominent person. If leadership is temporary, then the death of an influential individual can leave social relationships nullified if they are not reinforced by their clan or by a related person with elevated social status. As only powerful individuals had influence enough to arrange someone to be killed, this may have been enacted on behalf of either the deceased leader or by an emerging leader who sought to use the opportunity to take the position of the deceased by reinforcing established social relationships. However, as with the short-lived central involvement of Tubetube Island in Kula exchange (see Irwin *et al.*, 2019), the rise in complexity of trade, mortuary practices and cannibalism by 550 years ago on Rossel was disrupted only centuries later following colonial pacification.

The rise of feasts as a political tool

One final consideration expands the significance of these findings beyond the shores of Rossel Island and into the wider Massim region—the increased prevalence of feasting pots in the southern Massim archaeological record. Detailed analysis of Southern Massim Pottery has enabled changes in form and social use to be modelled (Shaw *et al.*, 2020; Irwin *et al.*, 2019). During the Middle SMP (400–200 BP) and Late SMP (< 200 BP) phases, pots became progressively larger and with an increased frequency of prominent appliqué bands. Bigger appliqué banded, open-mouthed pots are widely attested

historically and in the modern-day as feasting pots capable of holding larger quantities of food for communal gatherings. In this context, the emergence of feasting pots within the last four centuries suggests feasts had also become a regionally important practice, which besides mortuary settings, are closely linked to a prevalence of ‘revenge cannibalism’ elsewhere in the southern Massim. The appearance of SMP, the expansion of regional trade networks, cannibalism, interior settlements, and stone platform complexes, therefore, indicates relatively dramatic changes to the political structure of Rossel and Massim communities within the past five or six centuries.

Conclusion

The identification of fragmented, cut and burnt human skeletal remains on Rossel Island is strongly consistent with detailed ethnographic accounts of cannibalism. Dismemberment, cooking and eating a victim is a social practice which coincided with local and regional changes in socio-economic systems involving increased regulation of social institutions, including, but not limited to feasting and mortuary rites. The findings, when articulated within an ethnoarchaeological framework, contribute to regional models indicating a transformation of coastal and island lifeways over the past 550 years, within which time historically documented exchange systems such as Kula emerged. A shift in how individuals and groups might accrue power led to increased levels of local and regional conflict, ritualised killings, and feasts which only ceased or were augmented following colonial intervention at the turn of the 20th century.

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