ABSTRACT: A small whale’s tooth from the Solomon Islands, now in Te Papa, was found to have four very small holes drilled obliquely midway between its ends. Close attention to the form and function of these small holes indicated that this tooth had probably been drilled to enable it to be hung horizontally from its middle. The nature of the holes and the weakness of the ‘bridges’ between them make it unlikely that these teeth were worn as ornaments, but rather that they were hung or suspended in a stationary way, such as above tambu grave sites. This hypothesis was tested subsequently during fieldwork in the western Solomon Islands, and by examining whales’ teeth in various museum collections. These whale teeth now seem to have been an early, previously undescribed, traditional art form limited to some parts of the western Solomon Islands. However, this old form with tiny, hair-like holes apparently evolved into various new forms soon after foreign traders arrived, from about 1880 onwards, with many more teeth for sale. It is only later forms, based on the wearing of Fijian tambua as breast ornaments, that are recalled now by Solomon Islanders.

KEYWORDS: Melanesian art forms, Solomon Islands, whale teeth ornaments, artefact evolution.
The tooth at Te Papa

In 1943, Arthur Voyce, a Methodist missionary in the Solomon Islands since 1928, donated a small whale’s tooth to the Dominion Museum, now known as the Museum of New Zealand Te Papa Tongarewa (hereafter Te Papa), where it is kept as Item FE.4359 (Fig. 1). In the original inventory this tooth is described as ‘from Munda Bay, Roviana, 5 inches long, 1½ inches thick [approximately 13 cm by 4 cm]; with two holes two inches from the tip, and [two more] one inch from the root’. The holes are tiny, almost hair-like, but are symmetrically placed and clearly man-made, thus changing the natural tooth into an artefact. The holes have been drilled on a slant, so that they connect and form a very small ‘bridge’ under which a thin hanging thread can be passed. Similarly modified whale teeth have been found elsewhere in the western Solomon Islands, but nowhere else in the Pacific. There is no mention in the historical records of how these modified whale teeth were made and used or displayed, so in the following review their function is examined through their form.

Pacific context

Among many indigenous societies around the Pacific, a sperm whale tooth was once an important symbol of prestige, wealth or religion, or all three combined. Some were unmodified except for a drill hole or two so that they could be strung on a cord and worn. In 1769, Sydney Parkinson drew the famous picture of a Maori chief wearing a decorated sperm whale tooth, *rei puta*, as a neck ornament. The tip of the tooth was decorated with eyes and, at the other end, three drilled holes carried a thick plaited cord so that the tooth could hang round the chief’s neck (Kaeppler 1978: 177). Elsewhere in Polynesia, sperm whale teeth were usually unmodified except for one or two holes drilled through the hollow of the tooth near the gum end (proximal end), where the very hard tooth ivory was easiest to pierce. This, too, enabled a whale tooth to be worn as a personal ornament dangling vertically from a cord around the neck, like the *rei puta* (Davidson 1984: 78).

In Fiji, however, the sperm whales’ teeth *tambua* that were, and still are, important symbolic gifts of compassion, contrition and atonement were worn very differently. These *tambua* were pierced at both ends, including at the sharp and very hard tip, furthest from the gum. This enabled a *tambua* to be worn horizontally, dangling from a braided cord, with the curve of the tooth forming a crescent shape across the chest (Roth 1938: 26; Clunie 1986: 98, 176).

Whale teeth, *kalo*, from Marovo Lagoon

One form of attachment (Fig. 2) has been identified from Marovo in the Western Province of the Solomon Islands (the Marovo Lagoon area is only about 75 km south-west of Roviana – see Fig. 3 – but Marovo is the home of several language groups). Prior to the arrival of foreigners, teeth from whales, called *kalo* in Marovo, were very rare, but were highly valued and stored with other tribal treasures in *tambu* places such as graves. Most were unmodified teeth, without any drilled holes. Some show signs of considerable age, and even decay; however, it is known that foreign traders introduced not only various traditional rarities from other Pacific island groups, but also large numbers of new sperm whale teeth to Marovo, mainly after 1880 (Woodford 1897: 15; Bennett 1987: 41). (See Note 2.)

Today, little is known locally of the origins and significance of *kalo*. Where retained for traditional costumes, *kalo*
are strung from holes at both ends, and worn horizontally like the Fijian tambua (Fig. 2). In parts of Marovo, particularly where the Seventh Day Adventist Church predominates, kalo have lost their tambu status, and have been pillaged from most grave sites for sale to tourists in Honiara. Many have been carved painstakingly by hand and highly polished, as in such modern forms as the Spirit of Solomons – small three-dimensional sculptures depicting intertwined sea creatures and former family totem animals (Fig. 4). In this process, the value of these kalo as traditional cultural treasures has been ignored and spoilt, as these artefacts are transformed into high-quality, easily portable sculptures that can be sold in the Honiara area for immediate cash.

Only a very few kalo have entered museum collections. Even the Honiara Museum had only a few, so there was an urgent need to preserve more from mutilation. Consequently, while living in Honiara for three years, I encouraged a number of incorrigible kalo carvers to show me their whale teeth before they were carved and mutilated. I was able to examine many uncarved kalo, all taken from formerly tambu sites in Marovo, and to save 14 small teeth averaging only 10.5 cm by 4 cm. Among them, five are of no
great age, with two having single holes (probably made by metal drills) at the proximal end nearest the gum, in order to be worn vertically like Polynesian pendants. Three of the remainder appear to be very old but lack any drilled holes. Another old tooth has been slit lengthwise, but not pierced.

The remaining five teeth, all old, have tiny holes midway along their length, apparently in order to be hung horizontally. These small, drilled holes match those on the tooth donated by Rev. Voyce now kept at Te Papa. The placement of these holes is interesting, as is their tiny size. One tooth has two tiny, almost hair-like holes set as a pair close together, about halfway along the length. One has two pairs of tiny holes near the middle and one pair nearer the gum end. The third tooth, the largest, has two pairs of (coarser) holes on each side.

I concluded from the placement of these holes that these teeth could have been suspended horizontally, from a point closer to their centre of gravity, without any pierced end holes. Moreover, the suspension could have been made relatively easily by passing a thread through the paired holes, over the suspending ‘beam’ or support point, and through the next paired holes. This placement of two pairs of holes on each side of a tooth would allow two separate strings in two long loops, or perhaps two loops with only the one string passing through all four holes. By these means, reasonably stable support, and good balance, could have been achieved even though the holes are very small and suit only a very thin thread. An assumption was made that because the holes and ‘bridges’ are so small and weak, the teeth were more likely to have been hung stationary rather than worn, as wearing them would have placed too much strain on the tiny ‘bridges’.

It should be noted that the traders also brought better metal tools, including better drills, to the western Solomons from about 1880. The older stone-tipped hand drills tended to be used twice, once from each side, for each ‘bridge’, leaving obliquely slanting holes with counter-sunk rims (i.e. broader at the surface and narrower deeper down). Making even a small hole in the dense enamel of a large tooth would have been a major task with only stone-tipped drills. In contrast, a metal drill tip tends to leave a hole of even diameter throughout. These differences have been checked in museum collections and have proved a useful diagnostic feature, suggesting that drilling with stone-tipped drills became rare after about 1880 (though perhaps this is not an utterly reliable indicator now, given the skill of determined forgers).

In the field in Marovo in 1996 and since, I found that the local people knew very little indeed about the origins and traditional significance of kalo. No one was found who could suggest how their forebears might have drilled through the hard dentine of an ivory whale tooth to form such tiny holes that slant obliquely to meet together for threading. But some old people, such as Romulus Paone near Telina Island, were sure that a forest vine called pusi and a coastal hibiscus tree called leru provide thin but very strong filaments suitable for hanging such kalo. Unfortunately, no one was found who could provide any background to the former use and significance of these centrally drilled and horizontally hung kalo, except that until recently they were stored for safety in tambu places, as were undrilled kalo.

Fortunately, some earlier researchers, active in Marovo only a decade or so earlier, recorded that formerly such kalo ‘were a very high ranking traditional currency’ used for ‘barter and ceremonial exchange, within and beyond the lagoon area’. They were ‘also used in marriage payments, for the purchase of land, for magical formulae, and in the ritual appeasement of localised malevolent spirits’ (Hviding 1996: 93, 127, 245; Kupiainen 2000). Liligeto (1997) includes several contemporary photographs of kalo still treasured in private hands in Marovo.

Subsequently, a thorough inspection of the whale teeth available in the Honiara Museum revealed one drilled sperm whale tooth, Item 71.111, from a tambu burial site at Rai near Vuru on Vangunu Island, at the south end of Marovo Lagoon. This tooth has two pairs of identically placed tiny hair-like holes suitable for hanging the tooth horizontally from its centre.

**Whale teeth, kalo, from Roviana**

Whale teeth were also treasured among people of other language groups in the western Solomons. In 1891, Admiral Davis in HMS Royalist seized many during his punitive raids ‘to stamp out headhunting’ from coastal villages around Roviana Lagoon and at Munda (e.g. Edge-Partington & Joyce 1904: 130; Woodward 1905: 8). The British Museum has only one collected by Davis (Item OC 1884-188e). The true scale of these early foreign thefts from ancestral shrines around Roviana is more evident, however, at the Powell-Cotton Museum in Birchington, Kent, which has 23 whale teeth all collected by ‘E.H. Admiral Davis in 1892’ (Anonymous 1906). On
inspection, five were found to be unmodified while 18 have one or two holes drilled through the thin, hollow side at the gum end, some with counter-sunk drill holes (that indicate traditional hand-drilling), but most with straight-sided holes (as if made with a metal drill bit). Item 73/1938 is particularly interesting in having two pairs of tiny holes centrally placed like those on the tooth in Te Papa, but also a single large hole at the gum end (seemingly made by a metal drill), so that it could have been hung horizontally or worn vertically.

The first British Commissioner in the British Solomon Island Protectorate was Charles Woodford, who lived there from 1896 to 1915. He recognised from an early stage that whales’ teeth stored on ancestral shrines in Roviana were considered sacred and were of great importance to the people living there. As part of his campaigns to intimidate and punish headhunters, Woodford seized and confiscated people living there. As part of his campaigns to intimidate and punish headhunters, Woodford seized and confiscated at least seven whale teeth that are now in the British Museum. Still more were taken in Roviana and elsewhere at least seven whale teeth that are now in the British Museum. Still more were taken in Roviana and elsewhere by Woodford’s assistant from 1898 to 1904, Arthur Mahaffy, who wrote the following note on a pair donated to the National Museum in Dublin in 1923:

In the [western] Solomons these teeth are enormously valued and any natives who have seen this particular pair have been very much excited over them. In the villages I have raided [in Roviana and in northeast New Georgia and on Ranongga and Vella Lavella] the first thing my police look for are these teeth, and the loss to a community is one of the heaviest punishments that can be inflicted upon it. (Mahaffy mss. notes)

Mahaffy also noted that one tooth he seized (now Item 1923: 232 in Dublin) was from Nusaru in Roviana Lagoon, whose inhabitants had known so little of its true origin that they had ascribed it to an inland monster called ‘Ratovo’. It is a large but otherwise undistinguished sperm whale tooth (Fig. 9).

In the Auckland Museum, there are two kalo, Item 1934.145 from Kundu Island in Roviana, and Item 1934.145a, taken from nearby Wanawana Island, both collected in 1931. Both have been drilled for hanging on a thick, strong cord like a tambua.

Whale teeth, livo, from Ranongga and Simbo

On Ranongga Island, the original name for the tooth of a whale or a dugong was livo. The late Appusae Bei, an elder born there in 1913, ranked their value between that of the highly prized Tridacna shell rings bakiha and bokolo. He said livo were suitable for bride price as well as general trade. Not all were large sperm whale teeth; most were small teeth, probably from sub-adults and smaller whale species. He was adamant that livo were in use long ago, long before the arrival of foreign whalers in the nineteenth century. Appusae Bei thought that, on Ranongga, livo were not hung, but a short, thick, old tooth a local man found there in 2002 has two sets of the distinctive tiny hair-like holes, for threading and hanging.

In 2004, more livo whale teeth were found on old tambu sites on Simbo Island by local people. Two are old, thin teeth, much weathered, but both show faint marks of having been pierced with tiny holes midway for hanging. The third is a more extraordinary find, being an imitation whale tooth made of long-weathered Tridacna shell. It, too, is about 9 cm long and curved, and it has midway on its inner curve two pairs of two coarse holes drilled to carry a cord so that it could be hung horizontally from the centre (Fig. 5).

Hocart, who was on Simbo in 1908, used the terms ‘livo’ for a tooth and ‘kalo’ for a whale’s tooth. He wrote that

Under the [wider] term riko are also comprised whale’s teeth (kalo). A genuine one was kept by Njoni’s wife in connection with kenjo rarasa [a tambu-raising ceremony]. There exists imitations in veruveru-shell; one of these [belonging to Toala] was taken from the skull house at Panambili, and sold to us for five sticks of tobacco. This is also money ‘belong tamasa’ [that is, from distant ancestors]. It is hardly credible that these teeth became ascribed to tamasa within a period of 70 years or less, since the whalers began to call at Mandegusu [Simbo]. The only alternative is to suppose that the teeth of stranded whales were used [i.e. in use long before then] or that teeth were introduced by drifting Polynesians. (Hocart c.1908: 784)

Whale teeth from Choiseul, Vella Lavella and other islands

Whale teeth were also valued traditionally in parts of Choiseul Island. In August 1920, the Methodist missionary John Metcalfe found two very large teeth on a shrine on the summit of a high mountain inland from Sasamunga: ‘The larger was at least nine inches and weighed several pounds. There were marked on them a number of small holes,
Fig. 5 Whale teeth (*livo*) from Simbo. The top tooth is an imitation made from *Tridacna* shell. Like the three small real teeth below it, it has tiny holes drilled for hanging from the centre. All four are much weathered. The bottom tooth has much larger holes, but the bridges between these holes would have been too weak to support this heavy tooth had it been worn often as a body ornament. Private collection, Wellington (photo: Quentin Richards).
Whale teeth located in the British Museum in London and in the National Museum of Ireland in Dublin

Two whale teeth located in the British Museum confirm the earlier postulation that the tiny holes were drilled to enable teeth to be hung balancing from the centre (Figs 6, 7). The British Museum acquisitions register indicates that both were collected by C.M. Woodford, that is before 1915, and were purchased from A.G. Madan in 1929. Item OC1929.07-13.8 (Fig. 6) has, midway between the tip to the gum end, two tiny holes through which is threaded a tightly plaited thin vine with seven small shell rings and one dark blue glass bead. The tooth hangs evenly balanced from the vine threads. The second tooth, Item OC1929.07-13.9 (Fig. 7), also hangs well balanced but from eight evenly spaced holes, in four pairs, through which are threaded four hanging cords decorated with alternating red and white trade beads that meet together at a larger dark blue glass trade bead. On this tooth is a paper label marked ‘New Georgia’, which is probably the origin of both items, though there is no such indication in the original acquisitions register. A third tooth, OC1929.07-13.18, has three pairs of tiny holes from which it could be hung similarly, but no vine threads survive with it.

The British Museum collection includes three more sperm whale teeth collected by Woodford and later purchased from A.G. Madan. Item OC1929.07-13.5 has at the gum end two counter-sunk holes that probably pre-date the proliferation of metal drills by about 1890. Item OC1929.07-13.6 has thick holes at both ends and a thick, braided, fibre cord to enable it to be hung exactly like a Fijian tambua (Fig. 8). Item OC1929.07-13.7 is similar. The first tooth bears a paper label ‘New Georgia’, but this is not shown in the original accession entry. Moreover, the similarity with Fijian usages of whale teeth is compounded by the presence of Items 1909.91 and 1909.92, two dart heads from the tika game, donated by C.M. Woodford. Both are still labelled ‘Head of a Fijian “Ula na Tiqa” obtained in Solomon Islands where it was being worn as a pendant ornament’ (Clunie 1986: 68, 160). These two were almost certainly made in Fiji and brought to the Solomons by ‘blackbirded’ plantation labourers when their time expired and they were sent home. Over 10,000 men from the Solomons laboured in Fiji between 1870 and...
1911, and at least half returned home (Corris 1973: 149). In addition, some of the earliest mission teachers to serve in Western Province were Fijian.

During this period, whale teeth ceased to be so rare in coastal villages in many parts of the South Pacific. Hundreds, if not thousands, of sperm whale teeth were saved by the whalers who spread across the South Pacific after 1820. Moreover, the teeth so saved spread even more widely than did the whale ships, as traders began to seek whale teeth because they were easily obtained trade items that could fetch high prices among islanders who still regarded them as desirable rarities. For example, in 1893 and 1894, when HMS *Penguin* spent eight months surveying Marovo Lagoon, New Georgia and the surrounding islands, Lieutenant Somerville carried a large stock, and described ruefully how ‘I had nearly tempted Raku, the chief of Munggeri, to surrender to me an exceedingly large and well carved tomahawk, for [the enormous price of] three *kalo* (whale’s teeth), when a little old white-haired priest’ intervened to insist that not only was this long-handled fighting axe ‘very sacred’ but also that it was owned by ‘the whole village, and so was not the chief’s to sell’ (Somerville 1897: 393).

Somerville also wrote that, in Marovo in 1893–94, the desire for whales’ teeth (called in the native tongue *kalo*) is one of their remarkable distinguishing points, as they do not wear them as ornaments. However originated, a good whale’s tooth is now worth a very large amount of copra, and may be seen with other cherished possessions on a man’s grave. The goodness of a tooth is calculated as

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**Fig. 6** Whale tooth with traditional hanging. Hung horizontally from the centre on a tightly plaited thin vine with seven small shell rings and one dark blue glass bead. It was collected by C.M. Woodford (i.e. before 1915) but its exact provenance within the western Solomons is not known. British Museum collection number OC1929.07-13.8 (photo: Ben Burt).

**Fig. 7** Whale tooth with traditional hanging. Hung horizontally from four pairs of drilled holes with eight strands of alternating red and white trade beads. It was collected by C.M. Woodford (i.e. before 1915) but, although it now has a circular paper label marked ‘New Georgia’, no location was specified in the original accession entry. British Museum collection number OC1929.07-13.9 (photo: Ben Burt).
In the National Museum of Ireland in Dublin are two whale teeth collected by Arthur Mahaffy. These two teeth are important as they show dual forms of use and suspension. Mahaffy recorded that both were ‘part of the loot from Nusaru in Rubiana lagoon … regarded with great reverence, and I have had many enquiries since that time as to the whereabouts of this [sic] highly sacred tooth’ (Mahaffy c. 1922). Item 1923.232, which Chief Borodi of Banyetta and his tribe thought was from a monster ‘Ratovo’, is a large tooth (17.4 cm by 6.8 cm; Fig. 9). At the extreme gum end, it has five large drilled holes, counter-sunk (so not metal-drilled), through which is threaded a strong, plaited fibre line. The strong line would enable this heavy tooth to have been hung vertically, it is suggested, to be worn on the chest. In addition, at its widest point much by weight as by outward length. Many teeth are pointed, and hollow from the root (like the ‘kick’ of a bottle) for some distance up. These are the least valuable; and an unfilled tooth is much preferred to one that has been polished and made to look smooth and white. They seem to make no use of their wealth however; the mere fact of possession is sufficient… (Somerville 1897: 405).

Apparently in former times in Marovo clam-shell rings (**tinete** and **erenge**) and **kalo** could be ‘hung from sticks on tall rocks overlooking the sea …’ to appease or please mighty sea spirits to permit deferential humans to live nearby (Hviding 1996: 127). This reference to hanging, rather than wearing, whale teeth accords with the fineness of the holes and the weaknesses of the ‘bridges’ between the fine holes. (See Note 1.)

**Fig. 8** Whale teeth from the Solomon Islands hung in the Fiji style. These two teeth, also collected by C.M. Woodford, have been drilled at the ends, as in the Fiji style, although one was to have been hung horizontally as if a **tambua**, and the other has holes only at the gum end for it to have been hung vertically. The label ‘New Georgia’ is a later addition of unknown origin. British Museum collection numbers 1929.07-13.5 and 1929.07-13.6, respectively (photo: Ben Burt).

**Figs 9 (top) and 10 (above)** Two whale teeth with hanging cords. These two teeth, collected by A.W. Mahaffy (i.e. before 1904), have traces of very fine cords from which they could be hung either vertically or horizontally. Both bear labels recording them from Roviana Lagoon. National Museum of Ireland collection (photos: Rhys Richards).
this tooth has two tiny holes through which is threaded a very fine fibre carrying three very small white shell rings. By this thread, the tooth could have been hung horizontally from the centre, though probably not with sufficient strength at the ‘bridge’ to bear the rubbing and stresses that would be inevitable if it were worn on the chest on only a thin line.

Item 1923.231 is a more pointed tooth, 13 cm by 5.1 cm, which has both kinds of holes (Fig. 10). Set back near the gum end are two pairs of large, deep holes, with one threaded cord that carried 12 tiny rings of white shell, one now missing, which were threaded evenly but offset on two overlapping threads. The other pairs of holes, near where the tooth begins to narrow towards its tip, both carry similar threads, one with tiny matched rings on two twined threads, and the other with 12 tiny, even rings offset on two twined threads. At the base of each is a small scrap of bright red trade cloth. This tooth, too, could have been hung both vertically through the large holes near the gum end, or horizontally through the small holes near the centre.

Discussion

On reflection, it seems likely that these various suspension styles could reflect an evolving continuum. It is suggested that the earliest forms were unmodified whales’ teeth that were so rare that they were given high, or even sacred, status and for safety were kept on ancestral shrines and Tambu sites. Most, it seems, were undrilled. One at least was copied from *Tridacna* shell. At an early stage, some teeth were drilled with tiny holes so that they could be suspended to hang above the shrine, as were many other carved shell valuables, even including, it seems, some heavy barava plaques (see Note 1). Some suspension threads were embellished with small shell rings. Soon after the arrival of foreign beads, perhaps from about 1850 onwards, the old, small shell rings were superseded by coloured glass trade beads.

It is also suggested that as more and more was learned by Solomon Islanders about the use and role of tambua in Fiji, that is from about 1890, strong plaited fibre cords were added to older, traditional teeth so that they could be worn as ornaments, hung from the neck horizontally like tambua in Fiji (Clunie 1986: 177). Where treasured teeth survive in Marovo today as family heirlooms (Fig. 2), invariably they are worn horizontally as in Fiji (Liligeto 1997).

This change of fashion, and in form, could well have evolved soon after the arrival of foreign traders made whale teeth no longer rare. Comparable changes in traditional usage that evolved with the importation of foreign valuables can be documented elsewhere in the Solomon Islands, such as the imports of gold-lipped pearl shells that led to an evolution of new forms of *dafi* breast ornaments (see Note 2).

In conclusion, the initial query developed from an examination of the whale tooth artefact in *T* e Papa. Comparisons followed with close attention to differences in form that reflect differences in function. This in turn has suggested, again, that when foreign traders arrived in the western Solomon Islands from about 1860 onwards, many ‘traditional art forms’ were not static or resistant to modification. Rather, fashions changed and old forms evolved into new forms, including new uses for whale teeth.

Notes

1 Early photographs survive of several traditional shrines in the Western Province, but despite a wide search none has been found that includes suspended whales’ teeth. One has been located, however, that shows a heavy *Tridacna* shell plaque, an ornately fretted barava, that in 1924 hung above a shrine on a mountain top near the headwaters of the Kulambangara River in western Choiseul (Metcalfe 1927: 13; Milne 1936: 41). The best photo of this is Auckland Museum Photo C.26051. In western Choiseul at least, the significance of hanging was apparently related to the ‘line’ between fishermen and their anchors, as custom stories refer to this ‘line’ as ‘anchoring’ mankind to tribal land. Hence various shell valuables are sometimes called ‘anchors’ (Richards & Roga 2004: 22).

2 A similar case of foreign trade modifying a traditional usage into a new, more common, form is recorded by Ivens: ‘Gold lip pearl shell occurs in Florida [islands] … as a breast ornament for boys and men, known as davi. Though traditional to Florida, … it is confessedly introduced … It has been put into circulation by white traders and labour ships visiting Florida … Its scarceness in the earlier days of intercourse with whites caused it to be treated with great care… [but now] at Sa’a and Ulawa there is no thought of any sacredness attaching to the davi… In the days of the Roman Mission to Arosi, 1845–47, whalers were about Arosi and they might have brought the golden lip shell there from Florida as trade, or from the islands of Polynesia. These whalers had Polynesian crews, Maoris and Tahitians, and others … The rim, and the [circular] shape, and the method of wearing the original [full] moon davi thus corresponding with the Tahitian, there seems no doubt that the wearing [now] of [the modified, crescent or ‘new moon’] golden lip pearl shells as ornaments was
introduced into Florida by Polynesian crews of whaling vessels, and then spread further east along Guadalcanal and Mala…” (Ivens 1927: 393).

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