ARCHAEOLOGICAL INVESTIGATIONS IN THE VITIAZ STRAIT REGION, MOROBE PROVINCE, PAPUA NEW GUINEA

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This paper outlines the nature and results of archaeological fieldwork in the Vitiaz Strait region undertaken in order to investigate the evolution of the ethnographically-famed trading system which operated in the area until about 20 years ago (Harding 1967). The object of the work was to find and examine stratified archaeological sites which resulted from continuous long-term occupation, and which would yield evidence for local and long-distance movements of goods and associated changes in local adaptive strategies. Fieldwork was divided between a three-month preliminary season on Umboi (Rooke) Island and the Siassi Islands in 1983 and a six-month main season in the Siassi Islands and at Sio village on the New Guinea mainland in 1984.

THE STUDY AREA

The narrow but often formidable waters of the Vitiaz Strait separate the New Guinea mainland from the western islands of the Bismarck Archipelago (Fig. 1). With an area of about 800 sq. km, Umboi is one of the largest islands in the archipelago. It is made up of a number of extinct and dormant volcanoes rising up to 500 m asl in and around an ancient caldera, and features an extensive alluvial fan complex on the east coast. Much of the island is extremely rugged terrain covered by primary rainforest, with cultivation generally restricted to the inhabited parts of the caldera and the east coast. The northwest coast of the island is subsiding and the southeast emerging at unknown rates.

The Siassi Islands are a group of tiny raised coral islands scattered off the southeast tip of Umboi (Fig. 1). Only six of the 18 islands are inhabited. Two of these, Tuam and Malai, are large in local terms (about 0.8 sq. km) and lie 9 km and 14 km from Umboi respectively. Tuam rises to a maximum of 76 m asl and has almost no fringing reef and minimal beach development. The eastern part of Malai rises to about 45 m, while the western part is a low-lying sand platform. Unlike Tuam, the island is fringed by extensive reefs. The other four inhabited islands - Mandok, Aromot, Aronaimutu and Mutumalau - range from 0.05 sq. km to less than 0.01 sq. km in area. Scarcely raised above high water mark, they are set within a few hundred metres of Umboi amidst a maze of reefs, mudbanks and sandbars.

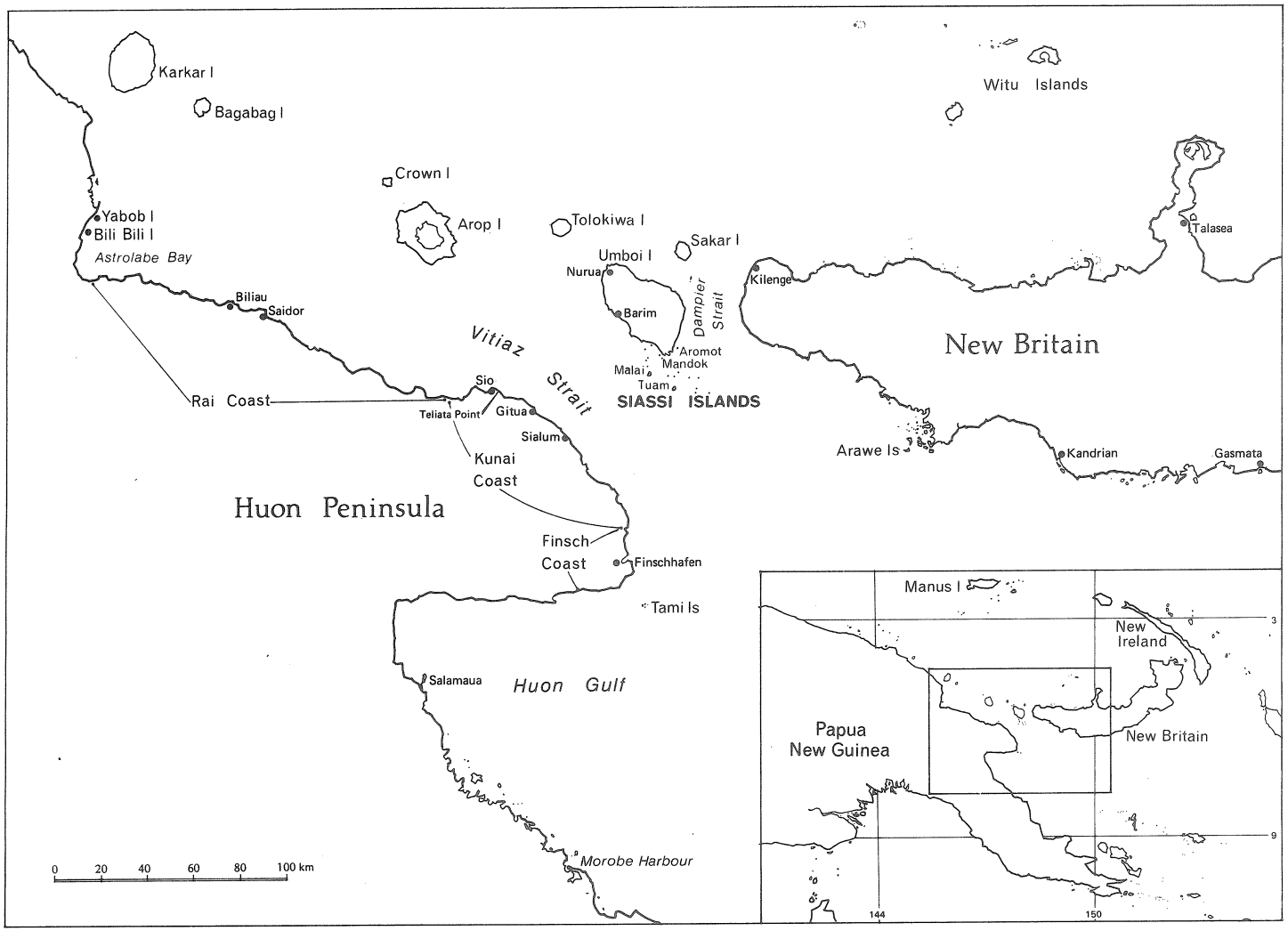

Figure 1. The study area; north-eastern Papua New Guinea and western New Britain.

Sio is a large village located on reef-fringed Teliata Point, at the western end of the geologically-famous raised coral terraces of the Huon Peninsula (Fig. 1). The village is split into a number of hamlets which are dispersed along both sides of a shallow lagoon incorporated in the point. Sio Island, where the entire Sio population lived at European contact, is an extension of the low terrace on which the village is now spread and lies about 200 m off the mouth of the lagoon. A series of moderately elevated, grassed terraces extend up to 2 km inland from the point to the Goaling River, beyond which the land rises steeply to form the foothills of the rugged and heavily forested Saruwaged Range.

THE 1983 SEASON

The 1983 season was the first archaeological work to be done on Umboi and the Siassi Islands. As such it aimed to assess the nature and distribution of archaeological sites through surface survey and test excavation in order to provide a foundation for more detailed study. A flexible strategy was adopted to cope with the range of logistic and environmental considerations which constrained the work. On Umboi it included two roughly north-south transects, one across the centre and a second (cut short by logistic problems) on the east coast (Fig. 2). The transects traversed most major environmental zones, while daisy loop surveys out from villages enabled the examination of locally-known sites and major environmental zones, and specific microenvironments not covered by the main transects. Systematic test excavations were done where possible. Work in the Siassi Islands focussed on the inhabited islands and included total surface surveys with systematic test excavations in all major ecological zones.

Results

Excluding isolated finds, a total of 14 sites was found on Umboi (Fig. 2). The nine sites on the first transect are badly disturbed by human activity, pig rooting and, at KLZ, crabs, swamp development and storm, river and tide action. In all instances except KLD, KLM and KLZ, surface indications consist of low to very low density scatters of obsidian, pottery like modern wares from Sio and Gitua on the mainland and, more rarely, marine shell. At KLD the density of surface obsidian and modern Sio-Gitua pottery is markedly higher than at other sites. At KLM there are two stone mortars embedded in the ground in the midst of a low density scatter of obsidian and modern Sio-Gitua pottery, while a relatively elaborate stone arrangement is located on the edge of the site. At KLZ, surface indications include large quantities of obsidian and other stone, modern mainland pottery from Sio, Gitua and Madang, and marine shell.

The test excavation at KLB revealed archaeologically sterile deposits. At sites KLC-KLE and KLL-KLN, the archaeological material, including extremely sparse and comminuted obsidian, modern Sio-Gitua pottery and occasional marine shells, was found to be restricted to the uppermost 20-30 cm of deposit. The highly disturbed cultural

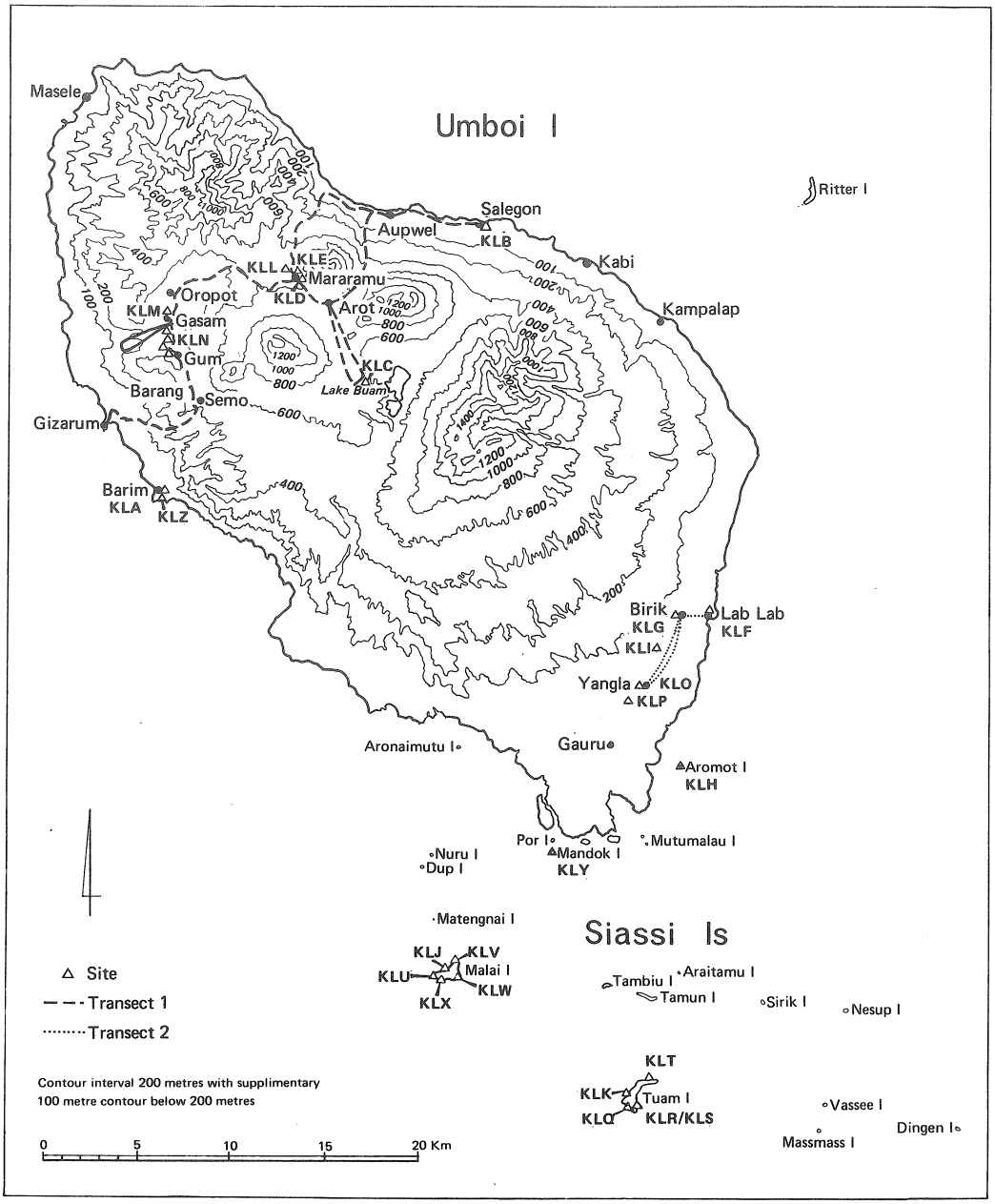

Figure 2. Map of Umboi and the Siassi Islands showing 1983 transects and site locations.

deposits at KLZ extended beneath the water table at 70 cm below surface. Three samples of marine shell from this site were submitted for radiocarbon dating, the results of which are shown in Table 1 (see also Lilley 1986:505-506). It should be noted that depths are measured from test pit datum, which in all instances was 5 cm above ground level, and refer to the middle of the excavation unit (spit) from which the sample was taken.

Sample No.	Site	Depth	Age BP	Corrected Age BP[1]
ANU 3872	KLZ	22 cm	270±60	<200
ANU 3867	KLZ	38 cm	98.7±0.8% MODERN	NA
ANU 3804	KLZ	75 cm	99.8±0.8% MODERN	NA
ANU 3799	KLI	20 cm	97.9±0.8% MODERN	NA
ANU 3870	KLK	18 cm	1300±70	850±70
ANU 3871	KLK	38 cm	1610±70	1160±70
ANU 3803	KLK	80 cm	1400±70	950±70
ANU 3821	KLJ	35 cm	680±70	230±70
ANU 3820	KLJ	64 cm	800±70	350±70
ANU 3819	KLJ	75 cm	540±70	<200
ANU 3822	KLJ	127 cm	680±70	230±70
ANU 3800	KLJ	155 cm	990±70	540±70
ANU 3801	KLJ	191 cm	740±70	290±70
ANU 3868	KLY	40 cm	680±70	230±70
ANU 3869	KLY	65 cm	1710±70	1260±70

[1] Ocean Reservoir Effect correction for marine shell: subtract 450 years (Gillespie and Polach 1979)

Table 1 1983 Radiocarbon Dates for Umboi and the Siassi Islands.

Like those on the first transect, the five sites found on the eastern transect (Fig. 2) consist of low to very low density surface scatters of obsidian, modern Sio-Gitua pottery and marine shell. Test excavations at KLF and KLG found archaeologically-sterile deposits, while at KLI, very small quantities of comminuted obsidian, modern Sio-Gitua pottery and marine shell were found in the upper 30 cm of deposit. A modern date was obtained for a sample of clam shell (ANU 3799) from 20 cm below surface (Table 1; also Lilley 1986:505-506).

Five sites were found on Tuam (Fig. 2) amidst a background scatter of isolated obsidian flakes, pot sherds and marine shells. Sites KLQ-KLT are on the raised part of the island and all except KLT were occupied within living memory. All these sites comprise moderate to high density surface scatters of obsidian, highly weathered and usually comminuted pot sherds and marine shell. None has a subsurface component. KLK is a relatively undisturbed stratified site which exhibits minimal surface indications of past human activity. It is discussed in more detail later in the paper. Radiocarbon dates obtained for three shell samples from a test pit in the site are shown in Table 1 (also Lilley 1986:505-506).

Five sites were found on Malai (Fig. 2), in addition to a background scatter of isolated obsidian flakes, pot sherds and marine shells. Sites KLU-KLW are highly disturbed, low to moderate density surface scatters of obsidian, weathered pottery and marine shell. KLX was a men's secret-sacred site before contact. KLJ is a relatively undisturbed mound site running along the eastern (inland) edge of the present village. Like the KLK site, it is considered in detail later. Radiocarbon dates for six samples of marine shell from the 1983 test pit in the KLJ site are shown in Table 1 (also Lilley 1986:505-506).

Archaeological deposits on Mandok and Aromot are all severely disturbed. In addition to a low density background scatter of obsidian, pottery and shell, a small complex of low mounds (Site KLY) was found on the western side of Mandok under the inland edge of the village and a newly-built church. Test pits and a trench which had been dug around the church revealed a continuous shallow layer of grey tephra about 30 cm below surface, with limited quantities of obsidian, pottery resembling modern Sio-Gitua wares and marine shell both above it and below it to a depth of about 40 cm below surface. Two samples of marine shell from the side of the trench, 10 cm and 30-40 cm respectively below the tephra, were submitted for radiocarbon dating. The first sample (ANU 3868) dates to ca. 230 BP, while the second sample (ANU 3869) dates to ca. 1,260 BP (Table 1; see also Lilley 1986:505-506). In an adjacent part of the mound complex a rubber shoe was found 85 cm below surface. On Aromot (Site KLH), grey tephra like that found on Mandok forms the present surface of most of the village area. Beneath it, a minimally stratified sandy sediment at least 1 m deep extends beyond the water table. Apart from a shallow extended burial, the only cultural material recovered by excavation was a woman's nose-bone. No radiocarbon samples were obtained.

THE 1984 SEASON

The 1983 investigations showed that the KLK site on Tuam and the KLJ site on Malai comprised relatively undisturbed stratified deposits which in combination covered a minimum time depth of ca. 1,200 years. These sites were thus suitable for further investigation in 1984. However, the lack of success in finding stratified sites of any antiquity on Umboi, and the 300-500 year gap between the dates for the upper levels of the KLK site and the basal levels of the KLJ site necessitated additional work elsewhere in the study area. This work was done at Sio, where Specht (1973) had previously discovered a large mound complex (Site KBQ). Sio was chosen for two reasons. Firstly, in ethnographic times it was an important overseas trading community and one of the two major specialist potting centres on the Huon Peninsula. It was thought that archaeological deposits at KBQ should therefore yield evidence for the evolution of trade and semi-specialized pottery production. Secondly, Specht's preliminary results suggested that some of the KBQ deposits might bridge the apparent chronological gap in the archaeological record in the Siassi Islands.

Six weeks were spent in each locality. In addition to the considerable assistance provided by local people, my wife ran the field laboratory in the second half of the season and Dr C. Gosden (now Department of Archaeology, La Trobe University) helped with various tasks during an eight-week visit in the middle of the season.

Excavation Methods

The three sites were mapped and a nominal 5 m square north-south coordinate grid was laid over each area. All excavations were square pits rather than rectangular trenches, principally because the former fitted better between crab holes and trees. Excavation attempted to follow major stratigraphic units, but where layers were thick or difficult to discern, arbitrary excavation units (spits) were employed. All material was passed through copra-wire (10-12 mm) sieves and all material from major pits, except very clayey or cemented sediment and that removed from sondages in coarse beach sand, was also passed through 6 mm sieves. On Tuam the depths of the major excavations were determined primarily by the water table, while on Malai and at Sio they were determined by agreements with local people who, because of concerns for safety and damage to their land, requested that digging cease when basal beach sand was exposed.

THE KLK SITE, TUAM

The site is a sparse midden located at Sau, on Tuam's southwest coast (Fig. 3). Sau is a relatively flat and approximately hemispherical place about 0.01 sq. km in area. The surface of the site is only a few metres above sea level, the highest part being a dune-like feature immediately inland of the beach. Like other low parts of Tuam, Sau is formed in an indentation in the coastal cliffs, on a coral platform which merges with the present fringing reef. The cliffs remain intact on the northern and southern edges of the area, but have collapsed on the eastern side to form a steep slope strewn with coral outcrops. The site is presently covered in coconut palms, with a pandanus thicket towards the southern end. During the main field season a small sweet potato and tapioca garden was put in towards the northern end, in the area of the 1983 test pit. Apart from the garden, which is one of very few made at Sau in living memory, contemporary day-to-day use of the area is limited to fishing and swimming.

Informants state that the area has never been permanently inhabited or intensively used and was traditionally a canoe harbour. Solution holes and shallow, elevated wave-cut notches in the cliffs immediately south of the site were favoured as hiding places during World War Two, but not used traditionally. Today, Sau is rarely visited by people other than its owners, primarily because it is home to a sometimes malevolent masalai or spirit.

Figure 3. Map of the KLK site, Tuam Island.

Excavation Procedure and Stratigraphy

To map the sub-surface dimensions of the site a 1.5 m sq. pit was dug on its northern edge (Pit I; Fig. 3), and 14 test pits of 1 m sq. (Test Pits 1 to 14; Fig. 3) were dug at approximately 10 m intervals along three separate and roughly east-west transects (Fig. 3). After the site was defined in this way, two more 1.5 m squares were excavated where sub-surface cultural material was most dense (Pits II and III; Fig. 3). In all instances the pits were the maximum size possible to fit between trees and crab holes.

The stratigraphy of the site is straightforward and comprises five continuous layers which extend almost to the edges of the site at similar depths (Fig. 4). The lowermost layers, 5 and 4, are very coarse calcareous beach sands. The basal unit (5) contains large numbers of coral fragments and no cultural material. Layer 4 has a sparse cultural component. Overall, this layer has a slightly lower content of small coral fragments than Layer 5, but in areas close to the cliffs surrounding the site it contains large numbers of sometimes cemented coral cobbles.

Above these beach sand layers there are three progressively darker-coloured layers of slightly clayey coarse sand containing some cultural material. The thickness of Layer 3 increases from Pit I to Pits II and III, and in the last two pits can be divided into sublayers A and B. The latter is a mixture of material from Layer 3A and the beach sand in Layer 4 and appears only in the centre of the site. Conversely, the thickness of Layer 2 decreases from Pit I to Pits II and III. Layer 1 is a very shallow humic topsoil. Layers 1-3 have been built up by *in situ* accumulation of cultural debris, wind- and possibly water-transported sands, and clay from the high part of the island surrounding the site. The deposits become increasingly clayey towards the east, where the cliffs to the north and south of the site give way to a steep slope. At the base of the slope Layers 2 and 3 are replaced by 60 cm of red-brown clay, which seals Layer 4.

Chronology

Radiocarbon dates for 13 samples of marine shell from Layers 1-4, including one *Tridacna* adze (ANU 4664), are shown in Table 2 (see also Table 1 and Lilley 1986:505-506). It should be noted that depths are measured to the middle of the relevant excavation unit from pit datum, which is shown as 0 cm on the section drawings.

The dates have been interpreted as follows (for details see Lilley 1986:126-130). Layer 4 was deposited between 2,800 and 2,500 BP. Two of the three determinations which fall outside this range (ANU 4613 and ANU 3803) reflect down-movement of Layer 3 material, while ANU 4610 represents redeposition of older material on the Layer 4 surface in Test Pit 10. Viewed in relation to the dates, the thickness of Layer 4 suggests that it built up at an average rate of about 0.2 cm/year.

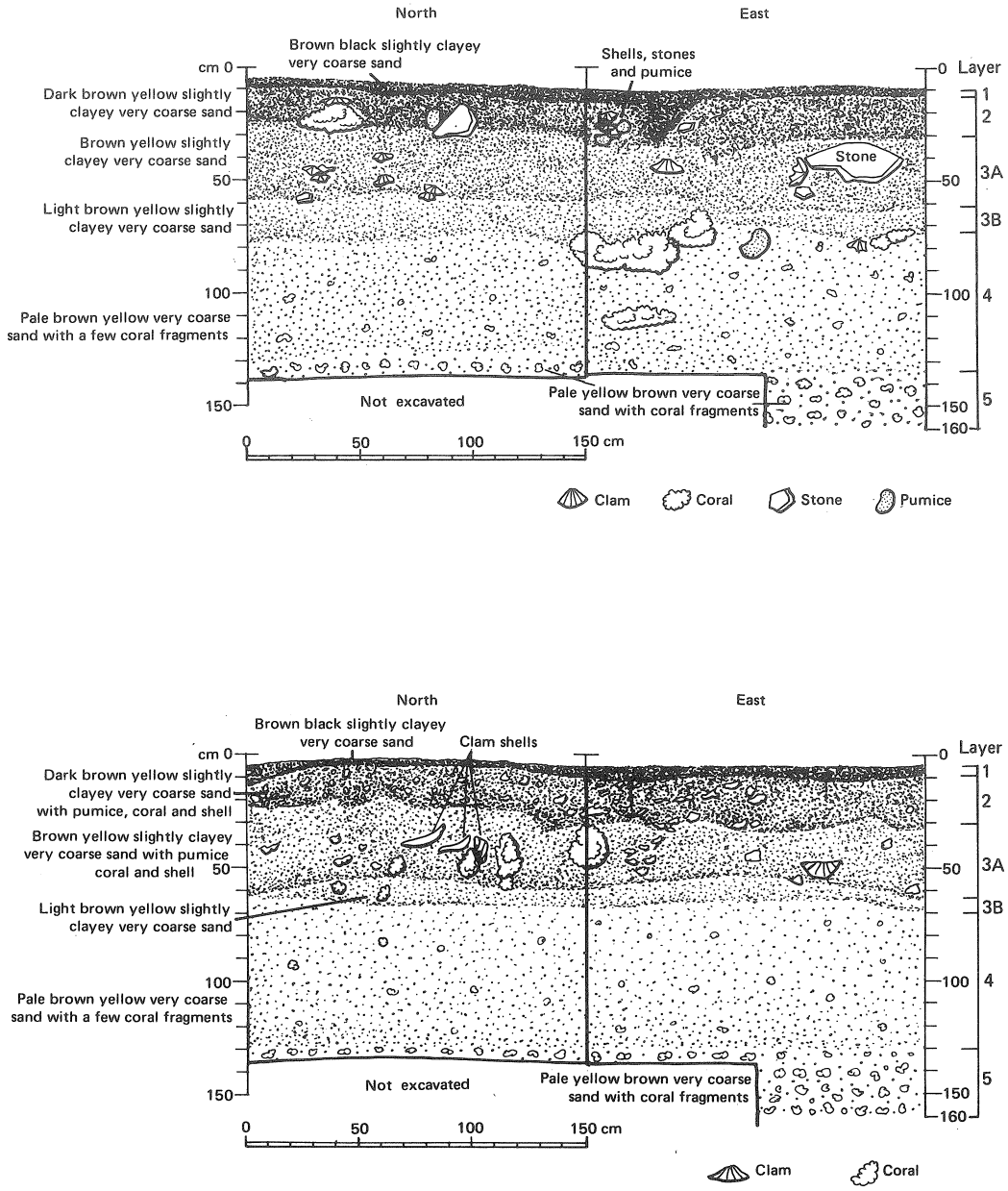

Figure 4. North and east sections of KLK Pits II (top) and III.

Sample No.	Depth	Pit/Layer		Age BP	Corrected Age BP[1]
ANU 4610	70 cm	10	4	3840±80	3390±80
ANU 4611	17 cm	I	1	820±70	370±70
ANU 4612	55 cm	I	3	1980±70	1530±70
ANU 4613	76 cm	I	4	2070±80	1620±80
ANU 4614	22 cm	II	2	750±80	300±80
ANU 4615	43 cm	II	3	1730±70	1280±70
ANU 4616	63 cm	II	3	1910±70	1450±70
ANU 4617	130 cm	II	4	2980±80	2530±80
ANU 4618	18 cm	III	2	1540±80	1090±80
ANU 4619	41 cm	III	3	2620±80	2170±80
ANU 4620	69 cm	III	4	3010±80	2560±80
ANU 4621	130 cm	III	4	3260±90	2810±90
ANU 4664	132 cm	III	4	2990±100	2540±100

[1] Ocean Reservoir Effect correction for marine shell: subtract 450 years (Gillespie and Polach 1979)

Table 2 1984 Radiocarbon Dates for the KLK Site, Tuam Island.

Layers 2 and 3 were deposited between ca. 850 and 1,600 BP. The Layer 2 date ANU 4614 and the Layer 3 date ANU 4619 lie outside this range. The former results from the down-movement of material from Layer 1 and ANU 4619 probably reflects up-movement of material from Layer 4. Given the combined thickness of Layers 2 and 3, the dates suggest that they were deposited at an average rate of about 0.1 cm/year.

ANU 4614 and ANU 4611 indicate that the Layer 1 topsoil was deposited at about 300-350 BP. The fact that Layer 1 is only about 10 cm thick in most places indicates that it is the product of minimal deposition, which accords with oral historical evidence for minimal use of the site area in recent times (see above).

In summary, the foregoing evidence suggests that three discrete phases of deposition are represented at Sau:

1. an initial phase of very gradual deposition dating to between ca. 2,500 BP and 2,800 BP,

2. a second phase of very gradual accumulation dating to between ca. 850 and 1,600 BP, and

3. a third and final phase of minimal deposition dating to ca. 300-350 BP.

THE KLJ SITE, MALAI

The KLJ mound extends more-or-less north-south for some 250 m along the eastern, inland edge of Malai village (Fig. 5). At its northern and southern ends protrusions extend west under the houses

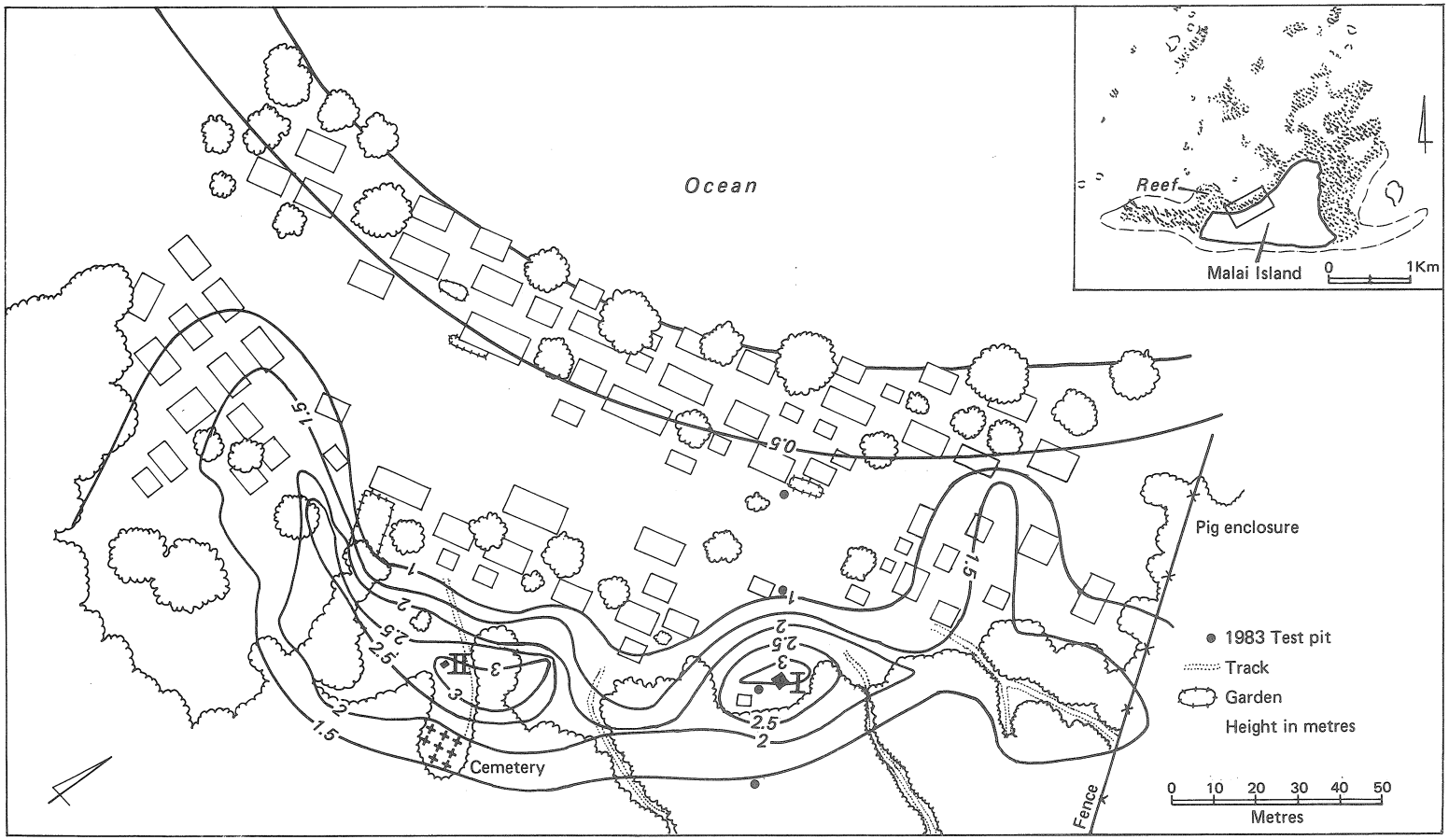

Figure 5. Map of the KLJ site, Malai Island.

for some distance. The mound varies in height, with the highest parts in the centre and south and the lowest in the north. It is cut in several places by paths and has been, and continues to be, planted with coconuts and other vegetation, built on, excavated for lime-burning and rubbish pits, and quarried. The quarrying is done to increase the area of flat ground for building and to build up the general village area in order to raise it above the water table so that it does not turn into a quagmire during heavy rain. The digging has made the western edge of the mound much steeper than the inland edge.

The Malai say the mound is simply a rubbish dump which was extended north and south from the present high point, Bizor (the location of Pit I; Fig. 5), which is identified as the place of the first landing and settlement. The traditional story is that Malai was settled from Barim village on Umboi by the descendents of people brought from Arop (Long) Island to the latter village by a mythical figure called Kilibob (or Namor in the Siassi Islands). The Bizor area belongs to one of the moiety-like sections of the community, the other of which traditionally lived at Parongatama (Site KLU; Fig. 2). Middle-aged people state that during their childhood the mound was higher than it is now, the reduction having been brought about by quarrying, and that the low northern part was built up on a waterlogged and probably intertidal area during their lifetimes.

Excavation Procedure and Stratigraphy

Two pits were dug in order to cover variations in stratigraphy. Their sizes and locations entailed compromises between likely depth of deposit and the presence or possibility of disturbance. The first pit (Pit I; Fig. 5) was made large enough (3 m square) to yield good information about the structure of the mound, and was dug close to the 1983 test pit. The second pit (Pit II) was 1.5 m square, its size being restricted by coconut palms and crab holes. It was dug about 75 m south of Pit I, near the current cemetery (Fig. 5).

As shown in Figure 6, the stratigraphy of the mound is quite complex and only the uppermost and basal layers of Pits I and II can be equated on stratigraphic grounds. The basal deposit (Pit I Layer 5 and Pit II Layer 6) is a pale-coloured very coarse calcareous beach sand containing coral fragments and small quantities of cultural material. In both pits, Layer 1 is an undifferentiated and highly disturbed grey-coloured mixture of very coarse calcareous sand and cultural material dominated by marine shell. The remaining layers in each excavation will be discussed separately.

Pit I Layer 4 (Fig. 6, top) is a brown, slightly clayey mixture of very coarse calcareous beach sand and small quantities of cultural material and has a mottled appearance where it merges with Layer 5. Layer 3 is a light grey-brown very coarse calcareous sand almost devoid of cultural material. The clay component of the deposits in

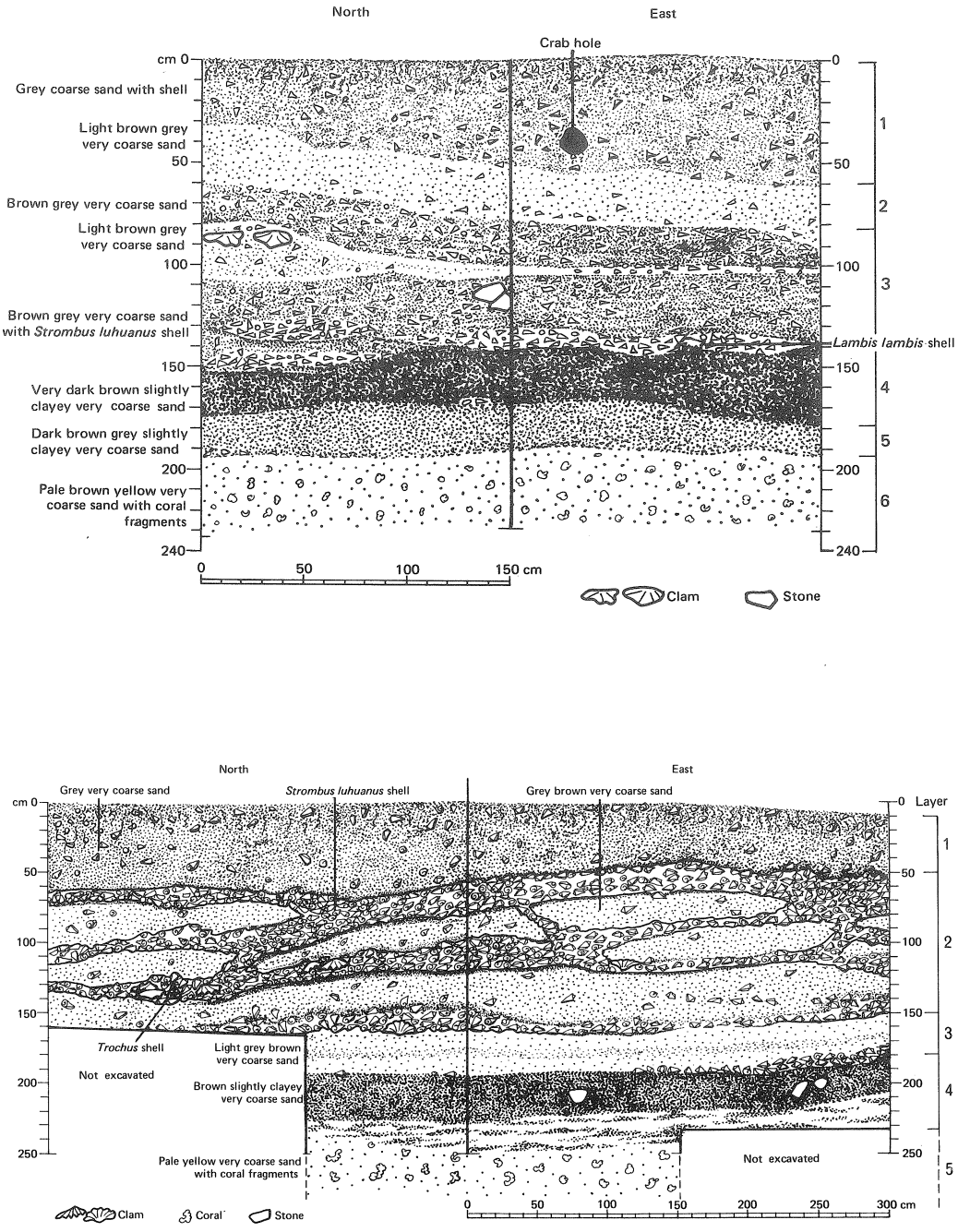

Figure 6. North and east sections of KLJ Pits I (top) and II.

Layers 3 and 4 almost certainly derives from the raised part of the island to the east of the site.

Layer 2 is a substantial deposit comprising a series of layers of grey-brown very coarse calcareous sand containing cultural material, interdigitated with almost solid layers of marine shell dominated by Strombus luhuanus and containing other cultural material. In the southwest quarter of the pit (not illustrated) this layer has been severely disturbed by the previous excavation by local people of a number of holes of varying sizes. Partly because of this disturbance and partly because of problems with a local man, the western half of the pit below Layer 2 was not excavated.

Pit II Layers 5 and 4 (Fig. 6, bottom) are slightly clayey very coarse calcareous sands containing small quantities of cultural material. The primary difference between them is in the colour of the deposits, Layer 4 being darker than Layer 5. The clay component of these levels probably derives from the raised part of the island. Layer 3 is made up of three sublayers. The upper and lower sublayers are very similar brown-grey very coarse calcareous sands containing reasonable amounts of cultural material and, at the base of the lower unit, a near-solid layer of marine shell. These two sublayers sandwich a lens of light-coloured very coarse calcareous sand containing a small amount of cultural material. The sediment in Layer 2 is a light brown-grey very coarse calcareous sand which is similar to that in the lens in the middle of Layer 3, but which contains more culture material.

In Pit I Layer 5 and Pit II Layer 6 there are shallow, small-diameter pits presumed to be post holes (which do not appear in the profiles), and very limited quantities of cultural material. This suggests that the surface of the basal beach sand may have been under houses and/or other structures, rather than a rubbish tip located near an inhabited area. Judging from the contemporary situation on the island it is almost certain that this surface was swamped when heavy rain raised the watertable above ground level.

In Pit I Layers 1-4 and Pit II Layers 1-5 there is no structural evidence for post holes or other features indicating habitation. This suggests that these levels may have been built up by the dumping of refuse from adjacent living areas rather than by accumulation under an inhabited area. The way in which this probably occurred can be observed in the village today, as women sweep up basket-loads of refuse from around their houses once or twice a day and dump it on a developing midden in the intertidal zone immediately adjacent to the village. Each cleaning episode results in a reasonably discrete lens of material being deposited on and/or amongst lenses remaining from previous episodes. When shellfishing has been intensive, for instance around the monthly maximum low tide, the basket-load lenses consist almost entirely of marine shell. At other times the basket-loads are mostly sand and extraneous refuse, including material previously quarried from the mound. The continual discard of items such as tins

and bottles augments the more regular dumping. This or a similar process may account for the stratigraphic differences between Pits I and II, and has probably also resulted in some cultural material which originated in the lower levels of the mound being spread at low density throughout the deposit.

Chronology

Radiocarbon dates for seven charcoal samples from Pit I and two from Pit II are shown in Table 3 (see also Lilley 1986:505-506). It should be noted that depth refers to the middle of the relevant excavation unit as measured from the pit datum, which is shown as 0 cm on the profile drawings.

Sample No.	Depth	Pit/Layer	Age BP
ANU 4341	67 cm	I 2	99.9±1.5% MODERN
ANU 4333	75 cm	I 2	111.3±3.4% MODERN
ANU 4342	83 cm	I 2	99.6±1.1% MODERN
ANU 4343	121 cm	I 2	100.4±2.2% MODERN
ANU 4344	138 cm	I 2	210±100
ANU 4345	191 cm	I 3	109.9±6.1% MODERN
ANU 4346	232 cm	I 4	310±170
ANU 4339	17 cm	II 1	101.1±1.7% MODERN
ANU 4340	182 cm	II 5	106.6±4.7% MODERN

Table 3 1984 Radiocarbon Dates for the KLJ Site, Malai

Together with the dates shown in Table 1, the above-listed determinations clearly indicate that the greater part of the Malai mound accumulated within the last 200 years (for details see Lilley 1986:140-143). In Pit I the interface between Layers 5 and 4 dates to ca. 300 BP (ANU 4346), the base of Pit I Layer 3 to less than ca. 200 BP (ANU 4345), and the base of Pit I Layer 2 to ca. 200 years BP (ANU 4344). Problematic determinations include ANU 3820 and ANU 3821 in Layer 1, which result from the displacement of material from lower levels, perhaps by the dumping practices mentioned earlier, and ANU 3800, which is thought to reflect upward displacement of material from the basal beach sand. Discounting these anomalies, the dates indicate that the deposits above the beach sand accumulated rapidly. If the top of Layer 1 in both pits is assumed to be 0 years old, calculations of age/depth ratios suggest that average deposition rates may have reached 0.8 cm/year in Pit I and 1 cm/year in Pit II.

In sum, the radiocarbon dates in combination with the stratigraphic evidence suggest there may be a two-part sequence of deposition represented in the KLJ site:

1. an initial phase of deposition on or in the basal beach sand, dating to older than ca. 300 BP and perhaps back to at least ca. 550 BP, and

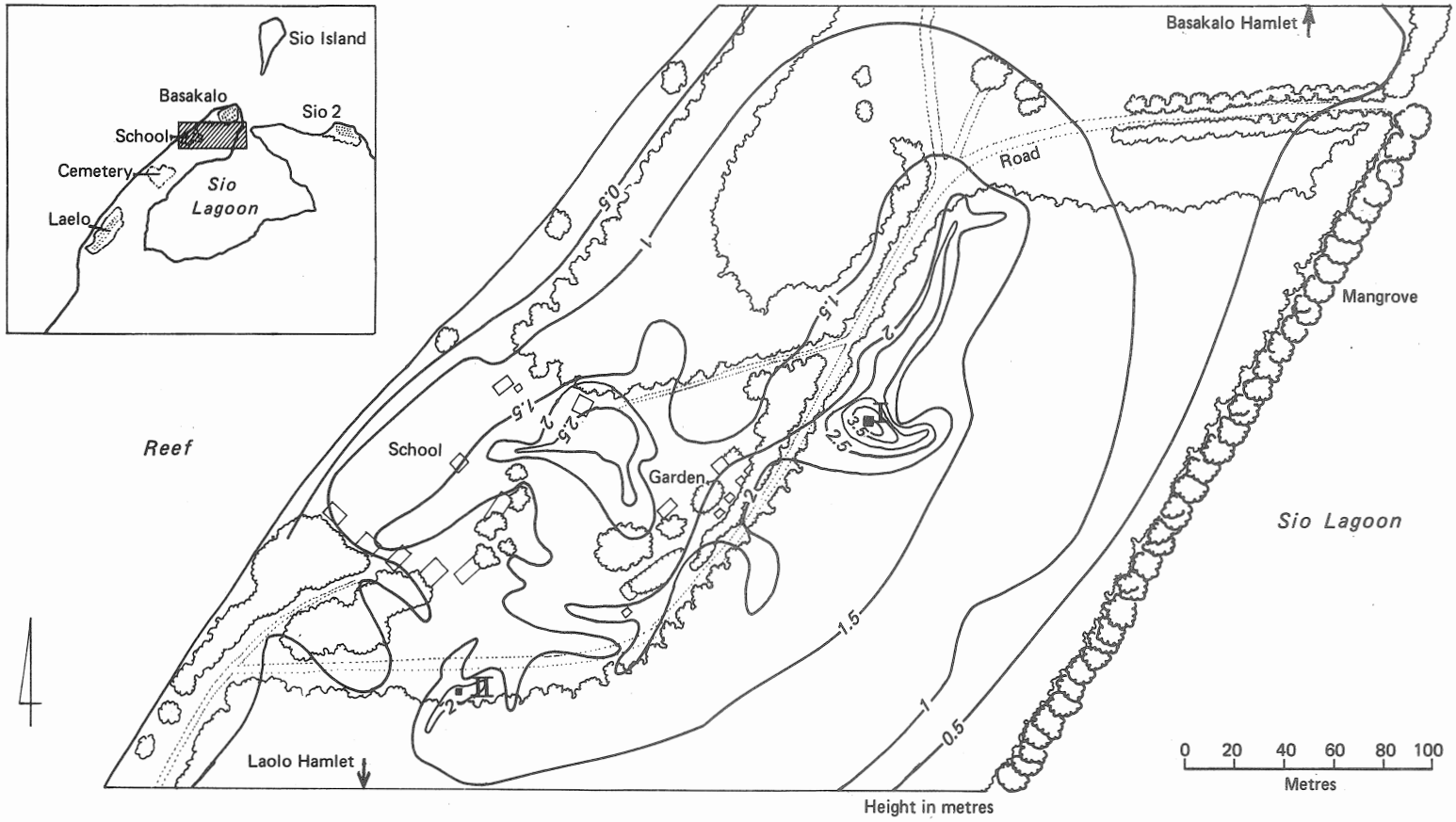

Figure 7. Map of the KBQ site, Sio.

2. a second phase of rapid deposition dating to within the last 300 years.

THE KBQ SITE, SIO

The mound complex at Sio is situated towards the northern end of the western side of Teliata Point (Fig. 7). It covers about 0.05 sq. km and extends almost completely across the area between the sea and the mangrove fringe of the lagoon. It is also extensively disturbed. The Sio primary school covers most of the site and there is a considerable number of buildings, gardens and toilet and refuse pits on and between the mounds. Only the eastern and southern margins of the site lie outside the school area. These areas are planted with coconuts and a variety of other trees. Most major disturbance in these areas is between rather than on the mounds, and comprises a disused well, a dismantled pig run and areas of pig rooting.

The site area has a central place in traditional history. Parts of the myths are briefly discussed by Harding (1967:64-65, 176-179). To summarize, the area was one of the three places around Teliata Point which were initially settled by Sio people after their culture heroes moved into the locality from the west. The KBQ area was supposedly abandoned in favour of Sio Island after a sorcery-induced catastrophe killed all but a few inhabitants, and it is thought the mounds were formed by the ground growing to cover the bodies left by the disaster.

Excavation Procedure and Stratigraphy

Two pits were dug in apparently undisturbed parts of the complex to cover intra-site stratigraphic variations. The first (Pit I; Fig. 7) was dug towards the northeastern end of the site on the highest mound in the complex. Its size was set at 2 m square to cover as much of the top the mound as possible and still leave work space. The second pit (Pit II; Fig. 7) was a 1.5 m square dug on a very low mound at the southern end of the site.

As shown in Figure 8, the stratigraphies of the two pits are different. Pit I has six main layers, while Pit II has four. The only layers which can be equated on stratigraphic grounds are Pit I Layer 6 and Pit II Layer 4, which are culturally sterile pale-coloured very coarse calcareous beach sands containing abundant coral fragments. Only the surface of Pit I Layer 6 and the uppermost part of Pit II Layer 4 were exposed by excavation because of the agreement with local people mentioned earlier. However, the profiles of nearby pits and graves and the depths of wells in the area indicate that culturally-sterile beach sand extends at least 2-3 m below the surface of the ground between the mounds. The other layers in the two pits are discussed separately.

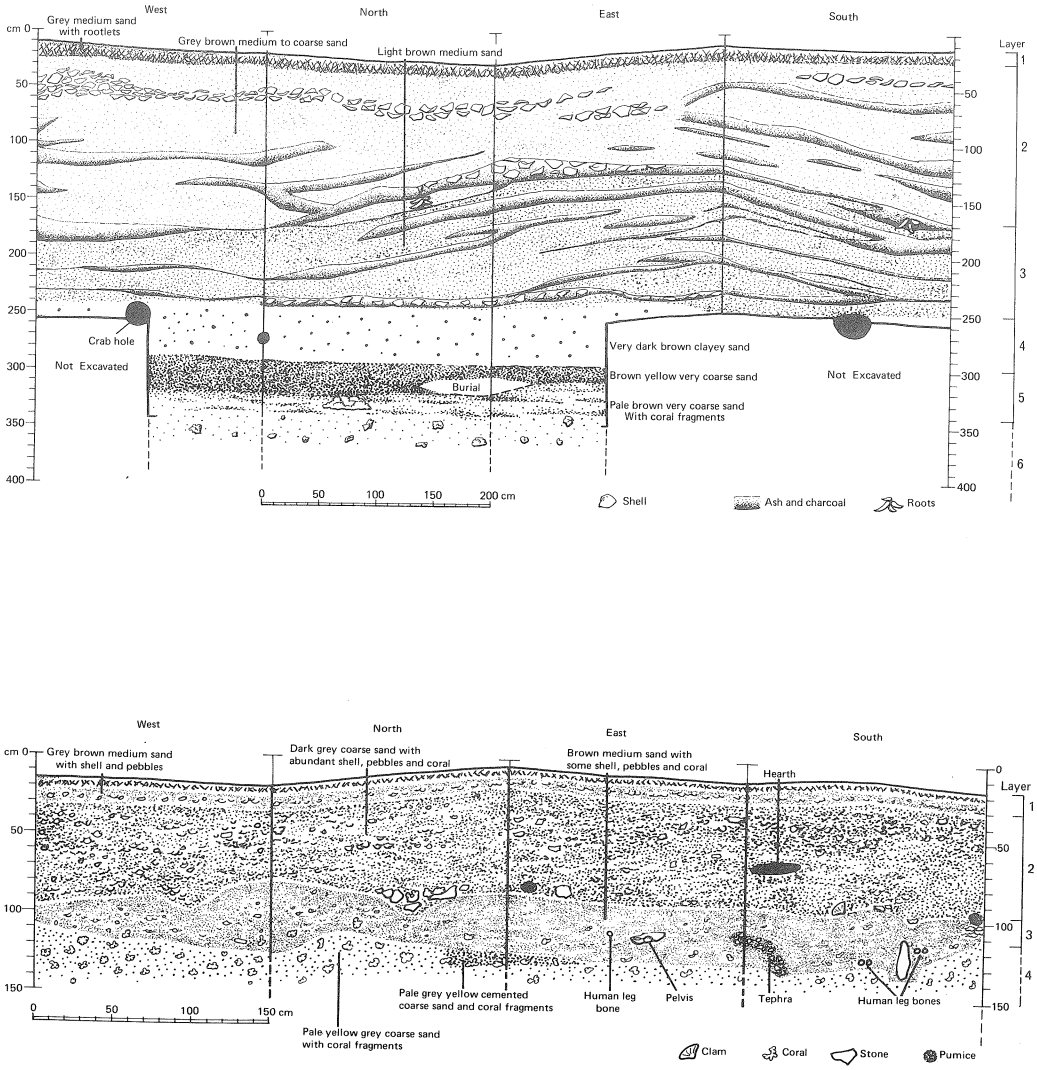

Figure 8. All sections of KBQ Pits I (top) and II.

Pit I Layer 5 (Fig. 8, top) is a brown-yellow very coarse calcareous sand which contains very limited quantities of cultural material in addition to two extremely degraded human skeletons. The lower part of at least one of the skeletons extends beyond the north face of the excavation. The skeletons were not in pits but in a lens of sand which is darker than, but otherwise indistinguishable from, the Layer 5 matrix.

Pit I Layer 4 is a compacted, very dark brown, very coarse calcareous sand containing small quantities of cultural material. The surface of the layer is hard and there are a number of crab burrows and other horizontal features which may have been burrows or root channels running across it. Partly because of this disturbance and partly because the pit walls became unstable, only the northern half of the pit was excavated below the Layer 4 surface.

Layer 3 is a light brown, medium-grade calcareous sand through which is dispersed a number of elongated ash lenses, as well as moderate quantities of other cultural material. There is also a dense lens of shell at the base of the unit in the northeast quarter of the pit. Layer 2 is grey-brown, medium to coarse sand interspersed with elongated ash lenses and containing large quantities of other cultural material. It is capped by a dense layer of Ephippium ephippium shells and there is smaller lens of shell at the base. Layer 1 is a shallow and highly disturbed topsoil.

In Pit I there are no structural features such as post holes, which suggests that the area was not lived on at any stage. It has not been determined how Layers 4 and 5 were built up but it can be suggested that Layers 2 and 3 result from dumping practices similar to those which can be seen today on Malai (see above). The ash lenses in these layers are not hearths but look like material scattered on old mound surfaces. It is also possible that some of the lenses reflect periodic burning-off of light vegetation covering the mound.

Pit II Layer 3 (Fig. 8, bottom) is a brown, medium-grade calcareous sand containing moderate quantities of pebbles, coral fragments and cultural material in addition to two human skeletons. One of the skeletons extends beyond the east face of the excavation and the other beyond the south face. Neither skeleton is in a pit nor in a lens of darker-coloured sediment like those in Pit I Layer 5, but both are simply enveloped in the Layer 3 matrix. Layer 3 also contains a discrete, angled concentration of unsourced orange tephra in the southeast corner of the pit. Pit II Layer 2 is a relatively substantial dark grey deposit comprising an undifferentiated mixture of coarse calcareous sand and large quantities of pebbles, coral fragments and cultural material. Layer 1 is a shallow and highly disturbed topsoil.

Apart from a small hearth in Layer 2 there are no structural features in Pit II, which suggests the area was not lived on. The absence of ash and/or shell lenses suggests that the Pit II mound was

not formed by dumping, but it has not been determined how the mound may have built up.

Chronology

Radiocarbon dates for five samples of charcoal and four of marine shell (ANU 4607-4609, ANU 4970) from Pit I and five samples of charcoal from Pit II are shown in Table 4 (for details see Lilley 1986:152-156, 505-506). It should be noted that depths are measured from pit datum, which is shown as 0 cm on the profile drawings. Except for ANU 4329-ANU 4332, each depth refers to the middle of the relevant excavation unit. The four dates just listed were taken from ash lenses after excavation was completed and their depths are exact.

Sample No.	Depth	Pit/Layer		Age BP	Corrected Age BP[1]
ANU 4970	57 cm	I	2	940±90	490±90
ANU 4332	115 cm	I	2	670±70	NA
ANU 4330	152 cm	I	3	340±90	NA
ANU 4329	175 cm	I	3	330±110	NA
ANU 4331	230 cm	I	3	LOST IN PROCESSING	
ANU 4606	232 cm	I	3	520±70	NA
ANU 4607	260 cm	I	4	1480±80	1030±80
ANU 4608	303 cm	I	5	1690±90	1240±90
ANU 4609	337 cm	I	5	1800±80	1350±80
ANU 4335	20 cm	II	1	151.0±2.4% MODERN	NA
ANU 4334	62 cm	II	2	450±100	NA
ANU 4336	99 cm	II	3	960±80	NA
ANU 4337	109 cm	II	3	1290±100	NA
ANU 4338	123 cm	II	3	1190±100	NA

[1] Ocean Reservoir Effect correction for marine shell: subtract 450 years (Gillespie and Polach 1979)

Table 4 1984 Radiocarbon Dates for the KBQ Site, Sio

ANU 4607-ANU 4609 indicate that Pit I Layers 5 and 4 comprise a discrete phase of deposition which lasted from 1,300 BP to 1,000 BP. In view of the combined depth of the layers, the dates suggest that they accumulated at a very gradual average deposition rate of about 0.3 cm/year. The dates from Pit I Layer 3 are also straightforward. ANU 4606 dates the base of the layer to about 500 BP, while ANU 4329 and ANU 4330 date the major ash lens just below the top of the layer (Fig. 8, top) to 300-350 BP.

The dates from Layer 2 (ANU 4332 and ANU 4970) are problematical in that they are older than those for the top of Layer 3. It is thought that they reflect redeposition of material of the same age as that in Layer 3, perhaps by dumping processes similar to those witnessed on Malai (see above). This argument is based on the fact that while Layer 2 is stratigraphically more recent than Layer 3, ANU 4970 overlaps with all the other Layer 2 and Layer 3 dates and ANU

4332 overlaps with all except ANU 4329, but neither determination overlaps with any dates from Layers 4 and 5.

The arithmetic average of the two oldest dates from Layers 2 and 3 (ANU 4332 and ANU 4606) suggests that together, these levels represent a period of deposition which began ca. 595 BP, while pooling those dates using the formula derived by Ward and Wilson (1978; also Wilson and Ward 1981) suggests the period began ca. 575 BP. As there are no dates younger than ANU 4329 and ANU 4330, they are taken to indicate that this period of deposition ended ca. 300-350 BP. If the top of Layer 2 is assumed to be 350 years old and the base of Layer 3 ca. 550 years old, the average rate of deposition during this phase can be crudely estimated at about 1.2 cm/year, which is four times the rate for the preceding phase.

The dates from Pit II indicate that same two periods of deposition are represented in that excavation. ANU 4336-ANU 4338 date Layer 3 as a discrete phase of deposition which lasted from 1,300 BP to 950 BP. In view of the depth of the layer, these dates suggest an average deposition rate of perhaps 0.1 cm/year during this time. ANU 4334 and ANU 4335 date the middles of Layers 2 and 1 respectively. The modern date from the topsoil is to be expected, while ANU 4334 suggests that Layer 2 represents a period of deposition of similar age to Pit I Layer 3. If the base of Layer 2 is taken to date to 550 BP and the surface to ca. 350 BP, the depth of the layer suggests that average deposition rates might have been 0.3 cm/year during this period, which is three times the rate of the preceding phase.

In sum, when combined with the stratigraphic evidence, the radiocarbon dates suggest that a two-part sequence of deposition is represented in the KBQ site:

1. an initial phase of gradual deposition dating to between ca. 1,300 BP and ca. 950-1,000 BP, and

2. a second phase of more rapid deposition dating to between ca. 550-600 BP and ca. 300-350 BP.

DISCUSSION

When the stratigraphic evidence and radiocarbon age determinations from the three sites are combined, it can be proposed that four major periods of deposition of cultural material are represented:

1. an initial period represented only on Tuam and dating between ca. 2,500 BP and ca. 2,800 BP,

2. a second period, represented on Tuam and at Sio, dating to between ca. 1,600 and ca. 850 BP on Tuam and ca. 1,300 and ca. 950-1,000 BP at Sio, during which average rates of deposition in both sites were probably slow,

3. a third period represented at Sio and dating to between 550-600 BP and ca. 300-350 BP, during which average deposition rates were probably rapid, and

4. a fourth period represented on Malai and dating from ca. 300 BP to the historic period, during which average deposition rates were probably rapid.

Analysis of cultural material laid down during these periods has shown that through time, patterns of intercommunal interaction in the Vitiaz Strait have varied considerably in configuration, content and intensity. The first period registers activity at a time when an areally extensive but probably relatively simple network brought unsourced Lapita pottery and obsidian from Talasea on New Britain and either Lou Island in the Admiralties or Fergusson Island in the Massim to the Siassi Islands but not Sio. The second period signals the sudden appearance of a network which can be considered remotely ancestral to the trading system of ethnographic times. During this period, obsidian from Talasea was transported to the Siassi Islands and Sio, while pottery from Sio and another mainland centre probably located towards the eastern end of the Huon Peninsula moved to Siassi. Pottery from Madang was carried to Sio but not to Siassi. During the third period, a combination of processes brought about the rise of Sio as a pre-eminent potting and trading centre and the demise of the Huon Peninsula pottery industry at a time when the Siassi Islands were unoccupied. The most recent period of deposition heralds the emergence of the complicated trading system witnessed by the first European settlers in the Vitiaz region and described in detail by Harding (1967). Further discussion of this sequence is beyond the scope of this paper and details will be presented in forthcoming publications.

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