Chapter 4

Preliminary Report on 2013 Fieldwork in Southwest Saudi Arabia by the DISPERSE Project: (1) the Farasan Islands

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4.1 Introduction

Fieldwork took place over a period of 6 weeks on the shell mounds of the Farasan Islands. Over 3000 shell mounds or shell-bearing sites have now been recorded. The majority of these sites are on the islands of Farasan Kabir, Saqid and Qumah, but small shell mounds or deflated shell scatters have also been observed on some of the smaller islands as well. The principal objectives of the 2013 work were: (a) to extend excavation and sampling to a larger number of shell mounds to complement the excavations previously completed at Janaba 4 and Khur Maadi 1057, and to provide a better understanding of inter-site variation, using techniques of rapid excavation and detailed sampling tried out on similar mounds in northern Australia (Shiner et al. 2013); and (b) to initiate a new major programme of radiocarbon dating and palaeoenvironmental analysis, including stable isotope analysis of the principal mollusc species *Conomurex fasciatus* (basionym *Strombus fasciatus*, Born) to provide information on processes of mound formation, seasonality of shell collection and climate change.

Three major clusters of sites were selected for sampling (Figure 4.1), resulting in the excavation of 17 shell mounds in a variety of micro locations associated with different types of location and shoreline environments. All stratigraphic sections were drawn and photographed. Samples for dating and 20 cm x 20 cm columns comprising bulk samples of shell-midden deposits were removed from the sections of every excavated deposit to facilitate the dating programme and the palaeoclimatic and palaeoecological analysis of the molluscan assemblages. Modern shells were collected to supplement the interpretation of isotope and trace-element signatures in the archaeological specimens. This resulted in 490 samples of bulk midden deposit and associated samples for dating. Some of this material was sorted and described in the field, and other material was brought back to England under permit for specialist analyses.

The Farasan fieldwork included, for the first time, the participation of a party of students from Jizan University, who spent a week taking part in excavation and post-excavation work (Figure 4.2). We also received visits from Dr. Rashad Bantan, Dr. Ramadan Abu Zied and Dr. Ibrahim Ghandour from the Department of Marine Geology, King AbdulAziz University, Jeddah, and Dr. Abraham Florius from the media section of the SCTA, Riyadh, who filmed some of the fieldwork activities.

4.2 Background

The Farasan Islands have one of the most extensive assemblages of undisturbed shell middens in the world, with over 3000 sites recorded to date (Figure 4.1), and many more yet to be surveyed in detail (Bailey et al., 2007, 2013; Williams 2010; Meredith-Williams et al., 2014). Previous results suggest that these sites represent a period of intense coastal exploitation centred on shellfish gathering and fishing. This hypothesis is based on evidence from excavations of two mounds during previous years: Janaba 4 (JE0004) and Khur Maadi (KM1057). Radiocarbon dates from these two sites puts the period of shell mound accumulation between 5500–5000 cal BP (3500–3000 cal BC) (Demarchi et al., 2010; Williams 2010). However, the two sites display markedly different compositions and patterns of accumulation, suggesting that they were used in different ways or for different activities.

The period around 6000–4000 BP is of particular interest. Climate became more arid (e.g., Arz et al., 2003), and domesticates, ceramics and farming are also thought to have arrived in the Southwest region during this time (e.g., Durrani, 2005). Whilst the Farasan Islands seem to demonstrate a well-developed coastal economy, the mainland has only hints of coastal exploitation, consisting of a few extensive shell midden deposits or scatters occurring as isolated sites or in small groups, but no real mounds. These scatters often show a broader subsistence strategy than shellfish gathering and fishing, with bones of domesticates and hunted game also present. Further investigation of the Farasan shell mounds is needed in order to better resolve the relationship between these sites and those on the mainland.

On the Farasan Islands, the shell mounds tend to form dense clusters of sites, concentrated around shallow bays that would have provided extensive and easily accessible beds of marine molluscs. Within the major clusters, the majority of shell mounds, and especially the largest ones, are on well-defined palaeoshorelines, often forming an almost continuous series of deposits in linear fashion along the shoreline over a distance of a kilometre or more. The palaeoshoreline itself is characterised by a wave-cut notch in the edge of the coral platform on which the mounds are located. The height of this platform above modern sea level and its distance from the modern shoreline varies because of localised tectonic deformation. Within the major clusters, there are often numbers of smaller shell middens, usu-

ally low mounds or shell scatters, set back from the contemporaneous shoreline, sometimes by as much as several hundred metres or more inland. This distribution pattern is not unique to the Farasan Islands, being found in other groups of shell midden sites in other parts of the world. The excellent archaeological visibility of the Farasan sites lends them to further investigation of this distribution pattern, in order to assess to what extent sites situated in different locations, and especially those situated further inland, have different functions, belong to different periods, or differ for some other reason entirely. The formation processes of shell mounds are another theme in need of investigation. Previous field seasons have thrown some light on this question also, but there is a need for sampling of additional sites.

4.3 Methods

We selected three clusters of mounds for more detailed study, one situated on the east arm of Janaba Bay (Janaba East), and the other two on either side of a large sand-filled inlet at the western end of Janaba Bay (Janaba West) referred to here as Janaba West (South) on the southwest side of this major bay, and Janaba West (North), on the northeast arm of the same bay (Figure 4.1). All three clusters are associated with shallow bays that originally afforded a rich and extensive habitat for marine molluscs, but which have become filled with sediments to form terrestrial sand flats and sand dunes, with progradation of the shoreline to its present position. All three clusters include a variety of deposits of different sizes, including some of the largest shell mounds in the area, as well as smaller mounds or scatters, and in different types of locations including sites on the palaeoshoreline, inland from it, and in some cases in front of the palaeoshoreline on the sandy infill of the former bay.

A representative sample of the sites within each cluster was selected for detailed investigation, including sites of different sizes and in different sorts of locations, resulting in a total of 17 excavated sites.

At each site, a 1 m-wide trench – or 2 m wide in some cases – was excavated from the edge of the site to the centre at what was judged to be the deepest point, in order to expose a section across one half of the mound and through the full depth of the deposit to the underlying natural surface. The shell deposit was removed with pick and shovel and piled on the side of the trench without further investigation. Any unusual material was noted and collected where appropriate but no attempt was made to sieve the deposits for non-shell material or to follow stratigraphic layers. There is, of course, a risk with this type of rapid excavation that individual

finds such as artefacts or vertebrate bone will be missed. However, previous work has demonstrated that these materials exist in such low density that very large volumes of shell deposit have to be removed to generate even a very small collection of small finds. Conversely, without rapid excavation, it is impossible to obtain sections through a sample of mounds from which well-provenanced and stratified samples can be collected for dating and palaeoenvironmental analysis. All excavation involves a compromise between the volume of deposits to be excavated and the care with which the excavated deposits are removed, a compromise best achieved through a two-tier sampling strategy in which some deposits are removed rapidly to gain an overview of major site features, and other deposits are selected for careful removal to maximise the recovery of small finds, small-scale features such as hearths, and material for scientific analysis.

The exposed sections were cleaned, photographed and drawn, with particular attention to evidence of layering, ash lenses, changes in shell composition and condition, unconformities and disturbances, and any other features of stratigraphic significance or indicative of ways in which the mound had accumulated. A column, 20 cm x 20 cm in area, was then excavated into the section, subdivided into 5 cm spits (units 5 cm deep). All material from each spit was collected in bulk and bagged separately, so that it could be sorted and analysed later. Sometimes more than one column was removed in this way from a given site, depending on its size, the depth of deposit and the complexity of the stratigraphy. Individual samples of shell or charcoal for dating were also removed directly from the section in relation to the observed stratigraphy by the radiocarbon specialist (Katerina Douka). Individual shells of *Conomurex fasciatus* required for laboratory analysis of growth structures and isotope composition were also removed directly from the section by the mollusc specialist (Niklas Hausmann). This method of sampling provides the best assurance that the results of dating and scientific analysis are securely provenanced. Since a major programme of radiocarbon dating and isotope analysis is a key element of the current Farasan project, systematic collection of high-quality samples is essential. Sediment samples for dating by Optically Stimulated Luminescence (OSL) were also taken, where appropriate, from underlying beach deposits and sediments at the base of sections to provide a date for the pre-mound surface. Bulk samples of sediment for soil micromorphology and phytolith analysis were also taken where appropriate from within or beneath the shell deposits.

After completion of the work, all trenches were filled in again to restore the sites to their former condition.

4.4 Janaba East: General Description

This group includes some 30 shell middens, ranging from tall mounds over 2 m thick to shell scatters (Figure 4.3). The most inland site is a ruined mosque about 900 m inland from the modern shoreline with other structures nearby, but there is no evidence of shell deposits here. A total of nine sites was excavated in this group, two shell mounds over 2 m thick (JE0086 and JE0087), one mound taller than 1m (JE0078), two low mounds less than 1 m thick (JE5641 and JE5642) and 3 shell scatters (JE5656, JE5662 and JE5800). JE 0097 has some coral blocks on the surface representing the remains of structures (Figure 4.4), but there was not sufficient time to excavate this site, so that it remains unclear whether the structure was built at the time when the shells were accumulated, or at some later date.

The excavations provided useful indicators of both local and more widespread environmental changes. Locally both JE0078 and JE0086 are located on a beach ridge aligned along the main palaeoshoreline. JE0087 and JE5656 are located immediately behind the main palaeoshoreline, but are located on their own beach ridge, which presumably represents an earlier shoreline, suggesting an early-dated seaward progradation of the shoreline after these mounds were accumulated.

At the base of JE5656 there is a palaeosol, which also appears beneath JE5641 and JE5642 where the shell deposits have protected it from erosion. This indicates that soil formation in this location occurred before the shell middens started accumulating and may indicate climatic conditions more humid than those present today.

JE0078. One of a number of low mounds c.1m in height and 10 m across that have merged to form an almost continuous line of mounds along the palaeoshoreline. This mound is truncated at its southern end by a watercourse that has cut through the old beach ridge and down to the coral bedrock, and eroded the side of the mound. This steep side was exploited to facilitate excavation of a short trench, c. 1.5 m in length to the centre of the mound (Figure 4.5). One column of 28 bulk samples was excavated from the section. The shell composition is predominantly *C. fasciatus*, but layers with numbers of larger gastropods are also visible in section.

JE0086. This is a 2 m high mound, 20 m across, located on the same beach ridge as the previous mound (Figure 4.6). A 2 m long section was exposed, although this did not reach the centre of the mound due to the presence of a concrete survey marker. It is composed predominantly of *C. fasciatus*, and a column sample resulted in 19 bulk samples.

JE0087. This is a 2 m high mound, 25 m across, located on a separate beach ridge to JE0086 – further inland (Figure 4.7). A 10 m long section was excavated to the centre of the mound; it is composed predominantly of *C. fasciatuss*, and 52 bulk samples were recovered from one column sample.

JE5656. This appears as a broad scatter, 20 m in diameter, with lithics and pottery on the surface, and much of the surface has been disturbed by vehicle tracks. The section shows a deposit that ranges from 20–50 cm in thickness, with a matrix-rich silt-sand shell deposit dominated by *C. fasciatus* (Figure 4.8). *Chicoreus* shells are also present. The underlying sediment is a beach ridge. A shallow trench was excavated through the deposit across the whole width of the site, and two column samples yielded 28 bulk samples.

JE5641. A low mound c. 30 cm high and 10 m across, set back inland. A 5 m long trench was excavated to the centre of the mound, exposing shell deposits dominated by *Conomurex fasciatus*, overlying a brown palaeosol preserved under the mound, and resulting in 11 bulk samples from 2 columns (Figure 4.9).

JE5642. A low mound, c. 75 cm high and 15 m across, also set back inland (Figure 4.10). A 10 m long trench was excavated to the centre of the mound, exposing shell deposits dominated by *C. fasciatus*, overlying a brown palaeosol preserved under the mound, and yielding 19 bulk samples from 2 column samples.

JE5662 and JE5800 are both scatters deposited onto wind-blown sand behind the modern beach (Figure 4.11). Both scatters are c. 1 m in diameter, and are only one or two shells deep. The dominant shell species is *Chicoreus* sp., and there is evidence of hearths in both deposits. Two bulk samples were recovered from each site.

4.5 Janaba West (Northeast): General Description

The northeast side of the Janaba West palaeobay has a very interesting distribution of sites that demanded investigation (Figure 4.12). Not only is there a major palaeoshoreline with traces of a notch typical of palaeoshorelines found elsewhere,

with shell mounds strung along the old beach ridge, but there are also no less than three further potential palaeoshorelines between the main ridge and the sea, as well as sites set back further inland. The five excavated sites form a transect through these features.

The three sites from the seaward palaeoshorelines are presumed to be the youngest of the group because of their locations (JW5719, JW5694 and JW5697) and all are very thin shell deposits no more than 30 cm deep that have probably undergone some degree of deflation because of the unstable sandy surface beneath them. All are located on low sandy beach ridges with shell scatters extending along the line of the ridge in each case. The sites appear to represent a response to environmental change whereby site locations followed the retreating sea.

JW1727 is located on the main palaeoshoreline and is a typical larger shell mound. It is located on a beach ridge, which in turn sits upon a slight rise in the coral terrace – perhaps a wave cut feature. Inland of this site is JW1705, a scatter deposit that sits on top of a deep palaeosol.

As with the Janaba East investigations, these sites appear to show changing local and regional environmental and climate conditions and human interactions with them.

JW1705. A scatter c.20 m across. The majority of the site is covered by a layer of *Chicoreus* sp., one or two shells deep (Figure 4.13). In places this is underlain by c.15 cm of *Conomurex fasciatus*. An in-filled gully runs beneath the site, filled with silt, and locally with *Chicoreus* sp. A trench 10m was excavated to the centre of this site, resulting in 19 samples from two columns.

JW1727. A 2 m deep shell mound about 30 m across, located on a beach ridge with extensive windblown sediment build up around the shell deposit. A 15 m long trench was excavated to the centre of the site, with two column samples taken, and a total of 65 bulk samples. One pottery sherd was found in-situ in the upper layers of the site during excavation. *C. fasciatus* is the dominant species, but mussel shells are also present.

JW5694. A scatter c. 5 m in diameter and 30 cm deep, composed of *Chicoreus* sp. and ashy sediment, located on top of a beach deposit. Many pieces of vertebrate bone and ceramics were recovered. Nine bulk samples were taken from one column (Figure 4.14).

JW5697. A scatter c. 5 m in diameter and one or two layers of shells deep (Figure 4.15), composed of *Chicoreus* sp., located on top of beach deposits. Nine bulk samples were taken from one column.

JW5719. A scatter c. 5m in diameter and one layer of shells deep, located on top of a beach deposit and composed of *Chicoreus* sp. (Figure16). Five bulk samples were taken from 1 column.

4.6 Janaba West (Southwest): General Description

On the south side of the Janaba West palaeobay, four more sites were excavated (Figure 4.17). Here the palaeoshoreline is most pronounced, with a clearly identifiable undercut notch, and this appears to become progressively more elevated towards the southernmost end to form a cliff some 2 m high. This shoreline has one of the most impressive linear distributions of shell mounds on the whole island, with at least 40 individual mounds including some very large ones, some of which merge into a single line in places. There are no later shell middens on the sand deposits in front of this palaeoshoreline. Two of the large shell mounds on the main palaeoshoreline were excavated, one at the mouth of the palaeobay close to the modern shoreline (JW2298), and one close to the northern end of the linear distribution of sites towards the head of the palaeobay (JW1807). Both of these are large mounds over 2 m high. The first inland site excavated is JW1864 – roughly midway along the distribution of linear sites, and set about 100m inland. The other (JW3120) is set back about 500 m inland.

Both JW2298 and JW1807 are deposited on old beach deposits, but the beach deposits under JW2298 are eroded into and overlying a palaeosol. JW1864 and JW3120 are also located on palaeosols. Again these sites show that the local conditions have changed, with both shoreline and climatic change affecting the landscape. In addition the beach sediments under JW2298 show that relative sea level was originally higher than the 1.5 m undercut cliff on which the mound sits.

JW1807. A 3 m high mound, c. 40 m in diameter, located on top of a beach ridge (Figure 4.18). A 20 m trench was excavated to the centre of the mound, and 115 bulk samples were recovered from three columns. The predominant species is C. C. *fasciatus*, and *Chicoreus* sp. is also present. A pottery sherd was found stratified in the upper layers of the mound.

JW1864. A low mound, c. 1 m deep and 15 m in diameter. A trench was exca-

vated to the centre of the mound, and 23 bulk samples were recovered from one column (Figure 4.19). The site overlies a thin palaeosol, and a single lithic piece was discovered at the base of the midden.

JW2298. A 2 m high shell mound, 30 m across. A trench was excavated to the centre of the mound, yielding 70 bulk samples recovered from two columns (Figure 4.20). The mound is located on a well-developed palaeosol, in turn overlain by a beach deposit. The coral platform on which these deposits sit has been undercut by marine erosion to create a typical notch, formed at the time when the sea came into the bay (Figure 4.21).

JW3120. A low mound of c. 50 cm thickness and 10 m diameter. This is composed of *C. fasciatus* with a limited palaeosol preserved under the mound, and resulted in 12 bulk samples recovered from one column in a trench excavated to the centre of the mound (Figure 4.22).

4.7 Conclusion

The progamme of excavations this season has given a new insight into the variability of the shell mounds and their relationship to changing shorelines and climatic conditions. The palaeosols preserved beneath some shell mounds are of particular interest, because soils do not currently form on the islands in the areas where the shell mounds are located. The palaeo-beach ridges preserved under many mounds also demonstrate the dynamic nature of shoreline change. Where these ridges have shifted seawards in relation to relative sea-level change, sites of shell deposition have moved with them. It is also clear that the sites as a whole span a considerable time range, rather greater than that indicated by the initial radiocarbon dates obtained from Janaba 4 and Khur Maahdi 1057. Some of the more recent sites found on the sandy infill, particularly at Janaba West (North) contain pottery and bones of vertebrate fauna, but whether this reflects differences in the use of different sites or different and perhaps age-related conditions of preservation will have to await further analysis. In addition, although *C. fasciatus* is the dominant species in most cases, there are differences in the secondary species at different sites, which may reflect habitat variations in different localities and at different time periods, as well as intermittent layers dominated by the larger gastropods, and this pattern will become clearer once analysis of the bulk samples has progressed further. At least one piece of pottery has also been recovered from within one of the large shell mounds on the major palaeoshoreline, which is the first time that an association

between in situ ceramics and shell deposition in the large shell mounds has been demonstrated, This is DISPERSE contribution no. 50.

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Members of the fieldwork team were: Geoff Bailey, University of York, UK, Niklas Hausmann, University of York, Matthew Meredith-Williams, University of York, UK, Khadija McBain, University of York, UK, Abdullah Alsharekh, King Saud University, KSA, Saud Al Ghamdi, King Saud University, KSA, Katerina Douka, University of Oxford, UK, Casey Beresford, University of Auckland, New Zealand, , Bernie Larsen, University of Auckland, New Zealand, Bassam Al Hilal, National Museum, Riyadh, KSA, Aied Al Hmaed, SCTA, Dawasir, KSA, Abdu Aqeeli, SCTA, Farasan, KSA, Abdullatif Aqeeli, Jizan University, KSA, Ahmed Gokhab, Jizan University, KSA, Abdullatif Hazazy, Jizan University, KSA, Hafez Hazazy, Jizan University, KSA, Ali Mutaen, Jizan University, KSA, Abdullah Zakaan, Jizan University, KSA

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Figures

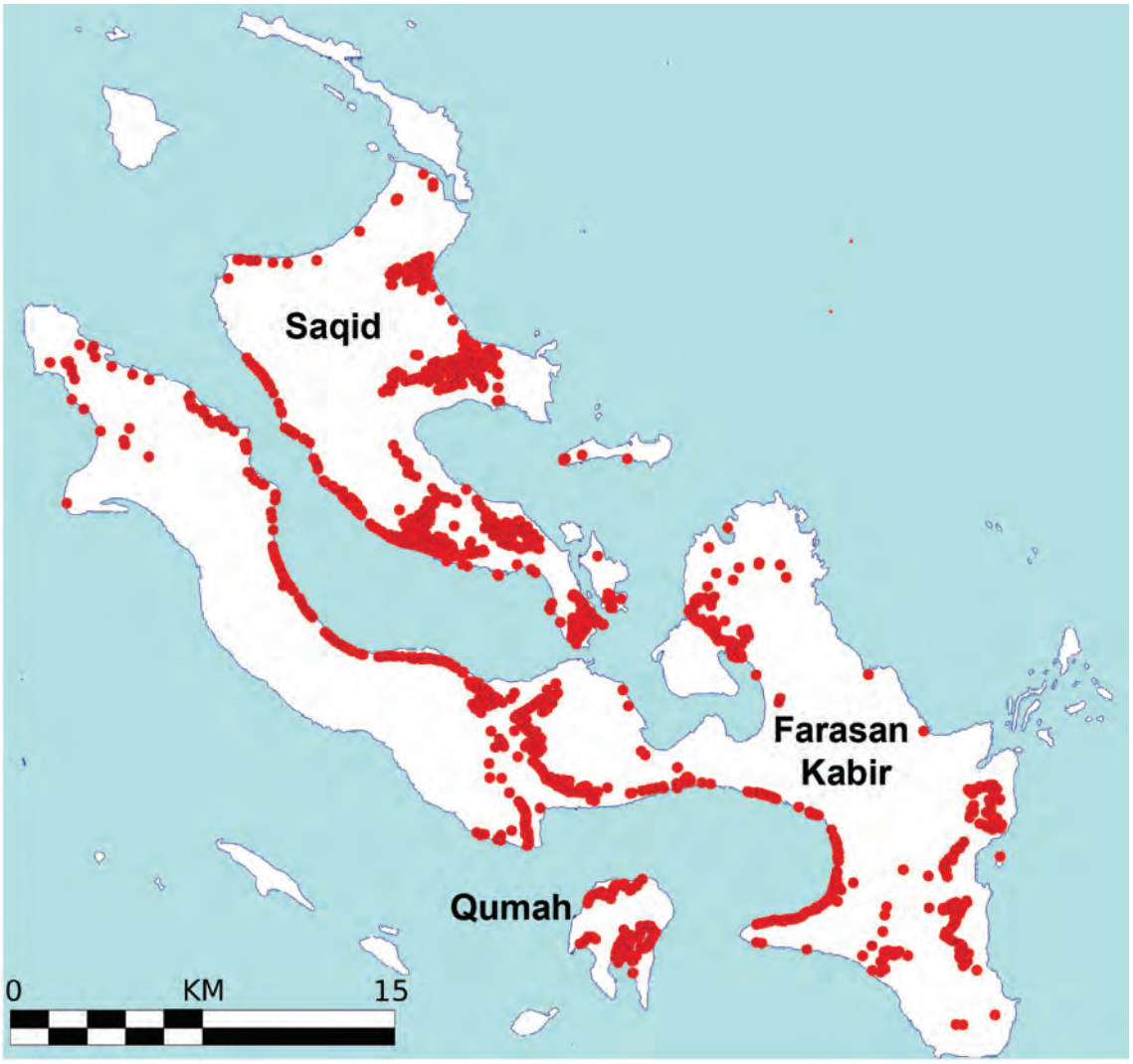

Figure 4.1. General distribution of shell mounds on the Farasan Islands, indicated by red circles, showing the three areas selected for more detailed sampling. Individual circles may comprise more than one shell mound. Map prepared by Matthew Meredith-Williams.

Figure 4.2. Members of the field team. L to R: Matthew Meredith-Williams, Bernie Larsen, Abdullatif Aqeeli, Abdullatif Hazazy, Geoff Bailey, Ahmed Gokhab, Hafez Hazazy, Abdullah Zakaan, Kasey Allely. Photo by Ali Mutaen.

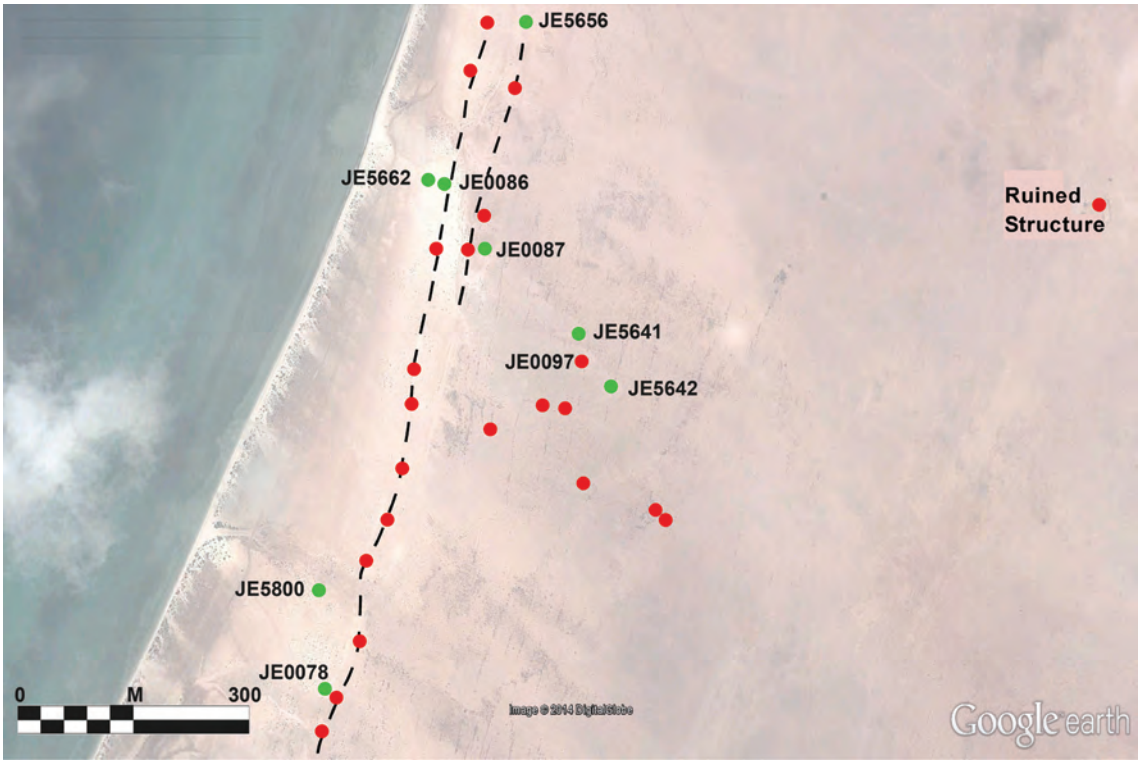

Figure 4.3. Distribution of shell middens in Janaba East (red circles), showing those sites selected for excavation (green circles). Dashed line shows the position of palaeoshorelines. Map prepared by Matthew Meredith-Williams.

Figure 4.4. Site JE0097, showing the remains of coral structures on the mound surface, looking northwest. To the right of the image is the spoil heap of red-brown soil from the excavation of JE5641, and the line of larger mounds is visible in the distance. Photo by Geoff Bailey, 4 February 2013.

Figure 4.5. Site JE0078 after the excavation of the main trench and before the removal of column samples. Note the darker lenses of ash and sediment near the top of the section and the predominance of larger gastropods in the lower half of the deposit. Photo by Geoff Bailey, 24 January 2013.

Figure 4.6. General view of Site JE0086 during the course of excavation, looking southwest. Photo by Niklas Hausmann 4 February 2013.

Figure 4.7. Sections through the large mound, JE0087, after removal of the column samples from the end section. The general layering of the shells and the presence of narrow ash layers is clearly visible. Photo by Niklas Hausmann, 31 January 2013.

Figure 4.8. Section through site JE5656. The lower part of the section comprises cemented beach deposit. Photo by Niklas Hausmann, 3 February 2013.

Figure 4.9. General view of JE5641 after excavation of the trench, looking west. The line of shell mounds distributed along the palaeoshoreline, including JE0086 and JE0087, is visible in the distance. Photo by Niklas Hausmann, 4 February 2013.

Figure 4.10. Section through JE5641. The shell deposits sit directly on the fossil coral platform. Photo by Niklas Hausmann, 27 January 2013.

Figure 4.11. General view of JE5642 excavated trench, looking east. Photo by Niklas Hausmann, 25 January, 2013.

Figure 4.12. Section through JE5642. Shells of the large gastropod, *Chicoreus* sp., dominate in the lowermost deposit and near the surface, with shells of *Conomurex fasciatus* more common in the intervening layer.

Figure 4.13. The shell scatter of JE5800 before excavation, looking inland towards one of the larger shell mounds located on the main palaeoshoreline. Photo by Geoff Bailey, 23 January 2013.

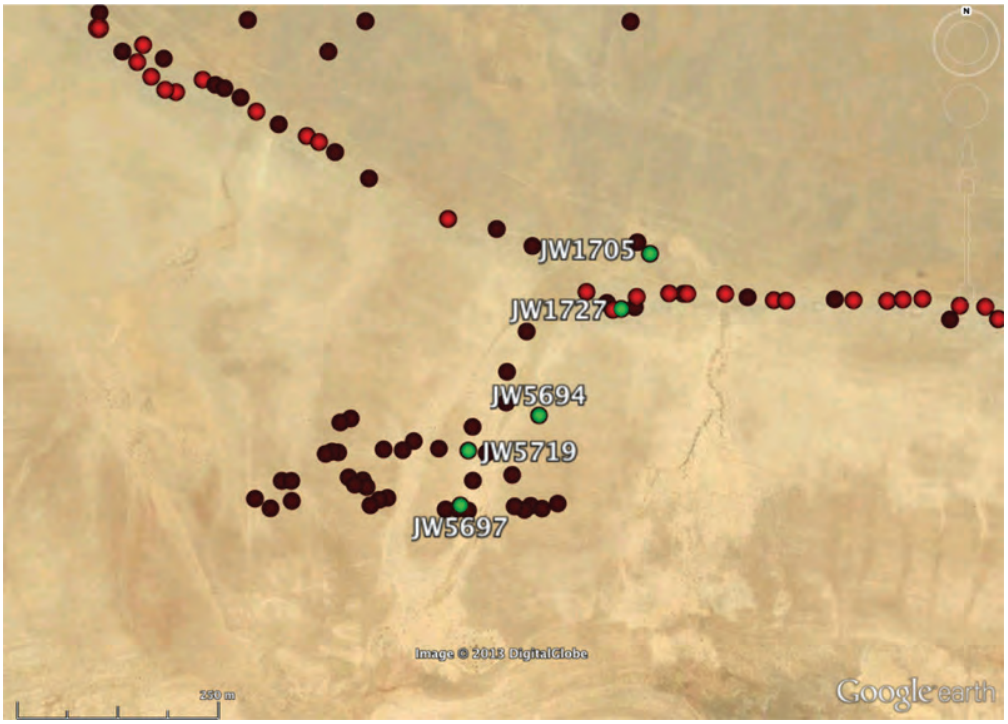

Figure 4.14. Distribution of shell middens in Janaba West (Northeast) showing those sites selected for excavation. Colour conventions as for Figure 4.3. Map prepared by Matthew Meredith-Williams.

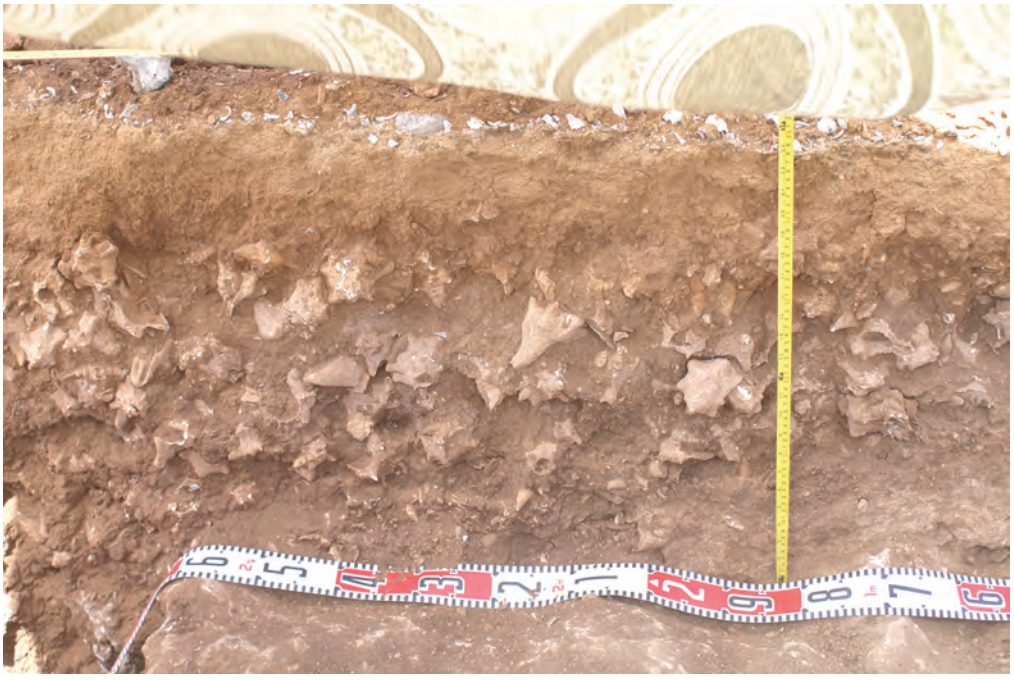

Figure 4.15. Section through JW1705, showing the dominance of large gastropod shells visible in section. Photo by Niklas Hausmann, 9 February, 2013.

Figure 4.16. Section through JW5694. Beach deposits are visible at the base of the section. Photo by Niklas Hausmann, 5 February, 2013.

Figure 4.17. Section through JW5697. The generally sandy matrix and the presence of beach deposits at the base of the section are visible. Photo by Niklas Hausmann, 5 February, 2013.

Figure 4.18. Section through JW5719, showing a layer of *Chicoreus* shells above a thick beach deposit. Photo by Niklas Hausmann. 5 February, 2013.

Figure 4.19. Distribution of shell middens in Janaba West (Southwest) showing those sites selected for excavation. Colour conventions as for Figure 4.3. Map prepared by Matt Meredith-Williams.

Figure 4.20. General view of JW1807 after completion of excavations, looking west. Photo by Niklas Hausmann, 23 February, 2013.

Figure 4.21. Section of JW1807, after removal of two column samples from the end section. Photo by Bernie Larsen, 23 February, 2013.

Figure 4.22. Section through JW1864 after removal of column samples. Photo by Niklas Hausmann, 21 February, 2013.

Figure 4.23. General view of JW2298 after excavation. Note the change in the pattern of shell accumulation in the right hand section. Photo by Niklas Hausmann, 23 February, 2013.

Figure 4.24. General view of JW2298 looking North, showing the undercut coral platform in front of the mound, and to its right the former bay, which is now dry. Photo by Niklas Hausmann, 23 February, 2013.

Figure 4.25. Section through JW3120 after removal of column samples. Photo by Niklas Hausmann, 21 February, 2013.