DMP V: Investigations in 2009 of Cemeteries and Related Sites on the West Side of the Taqallit Promontory

By David Mattingly, Marta Lahr and Andrew Wilson


Abstract

The ‘Burials and Identity’ team of the Desert Migrations Project carried out two main excavations in the 2009 season, at the monumental Garamantian cemeteries of TAG001 and TAG012, by the Taqallit headland. In addition, a detailed survey was made of cemeteries and other sites on the west side of the Taqallit headland, to set the two main cemetery excavations in context. A total of over 2,100 individual burials was recorded in this small area of a few square kilometres. This cemetery survey was combined with further research on the well-preserved foggara systems in this area, which originate at the escarpment among the cemeteries and run in a north-westerly direction towards the valley centre, where some additional Garamantian settlement sites were also located. The foggara research also involved excavation at four locations to try to elucidate issues relating to the dating of these.

A total of 22 burials was investigated at TAG001, an imposing cemetery of stone-built stepped tombs that had been badly damaged by illegal bulldozing in the 1990s. Although these had been subjected to robbing at some point in the past, many preserved considerable parts of the skeletons buried within and some surprisingly complete artifact groups. Of particular importance are a series of Garamantian necklaces in ostrich eggshell, carnelian and glass beads, which we were able to lift in perfect sequence and restring. At TAG012, about 2 km north of the Taqallit headland, we excavated an area of a mudbrick cemetery, exposing 12 square/rectangular tombs. Two further burials were excavated at the dispersed cemetery TAG006, in both cases involving tombs that had an interesting stratigraphical relationship with foggara spoil mounds.

Introduction and summary of results

By David Mattingly and Marta Lahr

The Desert Migrations Project (or DMP) held its third season of fieldwork in late December 2008 and January 2009, involving 15 Libyan archaeologists and geographers and over 30 specialists in these fields from the UK, Italy, Spain, Greece, The Netherlands, Germany, Canada and Tunisia. Five separate areas of work were undertaken by the team relating to: Geomorphology and Geochronology; Human Prehistory in the Sahara; Burials and Identity; Foggara-related Research; and Rock Art in the Wadi al-Ajal (for previous work of the project, see Lahr et al. 2008; Mattingly et al. 2007; 2008; Merlo et al. 2008). Separate reports have been produced on different aspects of this overall programme and are sequentially numbered in the DMP series, starting with this one, which focuses on the work on burials and foggaras in the Taqallit area (Fig. 1).

The ‘Burials and Identity’ team of the Desert Migrations Project carried out two main excavations in the 2009 season, at the monumental Garamantian cemeteries of TAG001 and TAG012, by the Taqallit headland. In addition, a detailed survey was made of cemeteries and other sites on the west side of the Taqallit headland, to set the two main cemetery excavations in context. A total of over 2,100 individual burials was recorded in this small area of a few square kilometres. This cemetery survey was combined with further research on the well-preserved foggara systems in this area, which originate at the escarpment among the cemeteries and run in a north-westerly direction towards the
valley centre, where some additional Garamantian settlement sites were also located. The foggara research also involved excavation at four locations to try to elucidate issues relating to the dating of these structures – including two burials that were overlain by foggara spoil and two instances of foggara shafts lined with mudbrick (where samples for scientific dating were obtained).

As regards the cemetery excavations, 22 burials were investigated at TAG001, an imposing cemetery of stone-built stepped tombs that had been badly damaged by illegal bulldozing in the 1990s. The bulldozing damage had removed all trace of the superstructures of tombs from a wide area of the site and this facilitated access to the subterranean burial structures. Although these had been subjected to robbing at some point in the past, many preserved considerable parts of the skeletons buried within and some surprisingly complete artifact groups. Of particular importance are a series of Garamantian necklaces in ostrich eggshell, carnelian and glass beads, which we were able to lift in perfect sequence and restring. At TAG012, about 2 km north of the Taqallit headland, we excavated an area of a mudbrick cemetery of square/rectangular tombs. Within our trench we identified 11 tombs, all visible at the surface and all robbed in the past with varying degrees of thoroughness. The detail of the construction of the tombs is of high importance, providing comparative evidence for the mudbrick cemetery at Saniat bin Huwaydi near Jarma. As at Saniat bin Huwaydi, there are indications of a second level of burials beneath the upper level and a twelfth tomb was found at a depth of c. 0.80 m below one of the tombs. This tomb was intact. Finds from various tombs included several intact amphorae, a fineware plate, flagons, incense burners and the usual beads. Two further burials were excavated at

![Figure 1. Location of the Taqallit promontory and cemeteries in relation to Jarma (ancient Garama).](image)
The dispersed cemetery TAG006, in both cases involving tombs stratigraphically related to foggara spoil mounds. Both were undisturbed and produced interesting burials, wrapped in leather shrouds. TAG006.T2 included some beadwork in fine blue faience and a remarkable haematite lip plug, *in situ* just in front of the young woman’s lower jaw.

**The Taqallit cemetery survey**

By David Mattingly and Farès Moussa, with Martin Sterry

A detailed survey of the cemeteries on the west side of the Taqallit promontory was undertaken in order to provide a broader understanding of the funerary landscape to which cemeteries TAG001 and TAG012 related (Figs 2–3). It was decided to limit this work to the broad embayment contained between the northern tip of the Taqallit promontory and its main western salient (Fig. 3). The Fazzan Project (FP)/Daniels survey had defined two small nucleated cemeteries at the tip of the western salient (TAG026/027), a large dispersed cemetery (TAG006), the monumental cemetery at TAG001 and a further small nucleated cemetery just to the north-east of TAG001 (TAG021). We decided at the outset of the 2009 work to exclude the north-west and north-facing slopes of the extreme northern tip of the promontory (previously recorded as TAG007), as well as further large areas of dispersed cemetery (with well preserved tombs) to the south of the main western salient of the promontory (TAG002, 003, 004, 005). There are additional cemeteries on the east side of the promontory (TAG013/014) which were also excluded from the survey this year. Nonetheless, within the c. 1.5km length of escarpment contained in the western embayment that we surveyed in 2009 more than 2,100 tombs or burials were recorded. It is clear that the funerary landscape here was very much more complex than presented in the initial FP gazetteer (Fig. 2) and to facilitate further analysis we designated numerous additional site numbers to cemetery zones (Fig. 3).

The methodology employed in the field was to record for each tomb (or other noteworthy feature) a waypoint using a standard Garmin handheld GPS device and to log these numbers with typological identifications following the standard FP/DMP morphology of cemeteries, tombs, stelae and offering tables. The GPS co-ordinates have an accuracy of within 4–5 m and this was felt adequate for an overall assessment of the composition of different areas (in terms of specific tombs types and features such as stelae and offering structures). Different parts of the embayment revealed unsuspected and significant variation in cemetery morphology, predominant tomb types and dating evidence. The results can also be compared and reconciled to some extent with remote sensing data. What we hoped to illustrate through the survey were the broad differences and similarities between the various cemetery areas.

**Tomb types**

Tombs were identified according to the classificatory schema developed in the FP work (Mattingly 2003, 188–205). The principal types relevant to the Taqallit promontory are the following (Fig. 4):
Figure 3. Overall view of the Taqallit promontory, mapping cemetery sites surveyed and excavated and showing the relationship of these with foggaras and settlement sites identified.
Type 1a. The **mound cairn** is a simple pile of stones forming a (generally) low surface marker. Sometimes there is evidence of a central cist or burial structure formed of large stones.

Type 1b. The **corbelled cairn** – a tall, conical cairn (generally of beehive shape) formed by progressively stepping in rings of stones – covers a burial within a subterranean shaft or below large slabs in a shallow central chamber.

Type 1c. The **kerbed cairn** is a variant on the simple mound cairn, being generally a low mound of small stones with an outer perimeter of larger stone blocks. The type can be hard to distinguish from low drum cairns that have been heavily disturbed by robbing action, though the amount of rubble around is usually a useful determinant. To put it another way, the drum cairn may be an evolved and generally larger version of the kerbed cairn.

Type 1e. **Crevice cairns** are graves placed in or against natural rock crevices and covered with piled stone, first recognised in the work in the Watwat area (Mattingly et al. 2008, 232).

Type 2a. Simple **unlined circular shaft burials**, unmarked at the surface, other than by the fill of the shaft.

Type 2b. **Lined shafts** (generally with vertical set slabs) or shafts delimited by rings of stone at the surface.

Type 3a. The **drum cairn** is a flat-topped cairn with vertical (or near vertical) delimiting walls of rough-coursed stone blocks. The interior is filled with larger slabs over the tomb setting, covered with smaller stone and chippings. Some drum cairns were of quite large diameters (up to 5 m), though more generally were 2–4 m in diameter.

Type 3b. The **drum tomb** is similar to the drum cairn, but may be distinguished by better quality coursing of the outer wall or greater height of the drum. In general, in the 2009 work we designated drum structures of < 60 cm height as drum cairns and > 60 cm as drum tombs. The largest drum tombs were up to 7 m diameter, but more commonly were 3–5 m diameter and often > 1 m tall on the downslope side. Both drum cairns and drum tombs can be found in circular and oval variants. Some drum tombs were built in stone, others in mudbrick.

Type 4a/4b. **Rectangular/square cairns** (4a) and **rectangular built tombs** (4b) are again distinguished from one another primarily in terms of scale, fineness of construction and height of the outer wall. Both are generally flat-topped. Examples of rectangular built tombs were constructed both in stone and mudbrick.

Type 5. This category covers a variety of **stepped tombs**, where a second (or third) was erected on top of an initial flat-topped circular (5a), rectangular (5b), multiangular (5c) or oval (5d) basis. The upper tier normally echoes the shape of the lower step, though drums with a superimposed conical cairn on top (5e) or quadrangular base with conical cairn (5f) are known. Again, stepped tombs occur in both stone-built and mudbrick variants.

**Pyramid tombs** in mudbrick are attested at TAG012, a mixed cemetery of mudbrick built tombs, including many type 4a/4b rectangular markers.

Most burials could be readily assigned to one or other of these types, though there are some subjective aspects of the typological boundaries – especially as regards the distinction between a drum cairn and drum tomb. A proportion of tombs in each cemetery area had been so badly damaged by robbing...
that the original appearance and type was by no means certain – though the nature of neighbouring tombs, the quantity of rubble thrown down and certain structural traits allowed us to be fairly confident in the majority of these cases. There is a tendency for the robbing to make some variants much less identifiable than others – stepped drum tombs for instance may have been more common than recorded in the survey, but the favoured method of robbing drum tombs through the roof will generally have eradicated evidence of the step. We have normally assigned the simpler typological category as the default in such cases, rather than over-speculating on whether a few stones represented a superimposed tier. Similarly at TAG001, it was fairly clear from the best preserved tombs that the majority of the monumental tombs were probably rectangular stepped tombs of 2–3 tiers. However,
the robbing and bulldozing activity limits our evidence in many instances to the default position of a rectangular tomb which may have been of either 4b or 5b type.

**Cemetery morphology**

The morphological categories applied to the cemeteries/funerary zones (originally developed in the FP, Mattingly 2003, 213–17) are as follows:

- **Type 1.** Zones of dispersed simple cairn burials (mainly mound cairns and kerbed cairns with occasional corbelled cairns). The predominant appearance will have been of low domed piles of stones.

- **Type 2.** Dispersed cemeteries containing simple cairns as in type 1, but with a degree of clustering, especially around small groups of flat-topped drum cairns and drum tombs. There are generally also higher levels of occurrence of corbelled cairns. A few of the larger tombs may be marked by proto-stelae and stone bowls (the precursors of the Classic Garamantian grave markers).

- **Type 3.** Nucleated escarpment cemeteries combine a range of tomb types, but typically are dominated by honeycomb-like arrangements of corbelled cairns and/or shaft burials. The evolved stelae and offering tables are sometimes found in relation to these cemeteries. Some of the corbelled tombs are quite large and imposing monuments and the presence of stelae and offering tables also gives an impression of special treatment of some burials. An unusual example of the type is provided by TAG001, where large areas of densely packed but free-standing monumental stepped tombs adjoin two main areas of dense shaft burials.

- **Type 4.** Similar to type 3 in terms of densely packed honeycomb burial structure, but lacking signs of monumental burials – monumental stepped tombs, large corbelled cairns, stelae and offering tables. Typically these sites consist of complexes of simple shaft burials.

- **Type 5.** Previously identified with cemeteries outside the Wadi al-Ajal, where there are no really densely nucleated escarpment cemeteries, but where areas of concentrated drum cairns and drum tombs have been noted. Though not generally built abutting each other, the drum tombs make a strong statement of communal burial practice through their relative proximity to each other. Proto-stelae and stone bowls may be attached to a significant number of burials.

- **Type 7.** Nucleated oasis cemeteries with elements of linearity and built in mudbrick have been noted previously at al-Hatiya. It was thought that TAG012 was of this type.

All the cemeteries examined in 2009 fit one or more of these categories. In a few cases it was felt that different areas within a funerary zone assigned a single TAG number corresponded to different morphological groups. This perhaps reflects the palimpsest nature of many funerary zones, where different phases of use of the landscape added to an original simple dispersed pattern of burial.

In addition to the cemeteries, the survey also encountered many other archaeological features: an escarpment settlement of simple huts of probable Early Garamantian date, Libyan inscriptions, surface quarries (at least two evidently used for the local production of funerary furniture), two caves that appeared man-made for mining some commodity from the escarpment side (in one case thought to be soft red gypsum which may be the source of the red pigment frequently found on the surfaces of stelae and offering tables), small enclosures attached to tombs or in close proximity (which may or may not have had a funerary purpose, see below) and a large number of traces of huts/tent placements. The two quarries (TAG052 and TAG062) were initially distinguishable by their light sandstone surface colour in contrast to the dark patina of stones which cover the surface of the surrounding escarpment slopes. They had obviously been cleared away in antiquity to access the soft sandstone
### Table 1. Preliminary analysis of tomb types and cemetery morphology for the western side of the Taqallit promontory.

Column 2 relates to cemetery morphology, while columns 3-21 give numbers of burials according to the established tomb typology.

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**Totals**
- 72 228 501 107 165 175 56 271 372 6 46 78 87 10 37 4 14 3 26 2258
- 3 11 23 5 8 8 3 13 17 0 2 4 4 0 2 0 1 0 104

Table 1. Preliminary analysis of tomb types and cemetery morphology for the western side of the Taqallit promontory. Column 2 relates to cemetery morphology, while columns 3-21 give numbers of burials according to the established tomb typology.
outcropping beneath and funerary furniture was manufactured on-site as the areas were littered with incomplete fragments of stelae and offering tables. A sample of 30 individual diagnostic fragments was analysed and recorded at TAG052, revealing details about the quarrying techniques and stonemasons working methods which include rubbed work, roughing-out and point-finishing (see Fig. 6c).

The presence of large numbers of occupation sites, even if mostly represented by rudimentary foundations for huts (zariba?) or tents, was a surprise for us – though they could relate to a number of labour-intensive activities attested along the escarpment zone. Some at least (TAG087) appear to be part of an Early Garamantian settlement site relatively high on the scarp. Others could relate to cemetery construction or foggara digging (a number of sites associated with Garamantian/Roman pottery – TAG058, TAG061, TAG067 – are suggestive here). Yet others appear to have been post-Garamantian in date in that they overlay funerary features, contained more recent pottery or simply appeared to be of ‘fresher’ build. It is possible that these latter sites represent temporary occupation by groups of tomb robbers as grave opening seems to have been practised on a very large scale. There is further evidence accruing that Garamantian beadwork was the prime motivation and target for these people.

Table 1 presents the evidence from the cemeteries explored in 2009 according to the overall morphology of each funerary area and the numbers and percentages of the different tomb types recorded, while Table 2 provides a breakdown of the distribution of funerary furniture. Although there is further analysis and refinement to be carried out on this data, and some of the final numbers may change slightly, the overall picture is fairly clear. The chronological equivalents of the DMP phasing (e.g. Classic Garamantian) are laid out in Table 4, with the primary dating evidence (see below DMP, Pottery and Other Finds).

A broad distinction exists between the cemeteries on the low-angle terraces directly in front of the steeper escarpments (generally at altitudes of between 475–500 m asl) and those on the steeper slopes of the escarpment proper or in the gullies cutting back into it (generally c. 480–550 m asl). The demarcation between these lower and higher escarpment cemeteries was not always clear-cut and our survey work tended to delimit them in terms of sharper changes in slope, increased density of tombs or natural features such as gullies.
In contrast with the work in the Watwat embayment, where most cemeteries produced some Garamantian pottery (predominantly of the Classic phase), pottery was very scarce in many of the cemeteries recorded this year, with the notable exception of the Classic Garamantian cemeteries (TAG001, TAG012, TAG021, TAG026, TAG027, TAG050, TAG051) and occasional tombs in other cemeteries. We strongly suspect that this is because many of the other cemeteries are of the Early or Proto-urban Garamantian phases and that pottery was not regularly included in burials prior to the Classic phase. This is suggested by the excavation of two aceramic tombs in the dispersed cairn cemetery TAG006 (T1 and T2; see below), and we hope to test this hypothesis next season by excavating a further sample of the escarpment cairns and tombs. However, it is also apparent that the higher escarpment cemeteries are not all of a type (or perhaps of the same date) as they exhibit different typological characteristics. These too will need further fieldwork to elucidate the potential social or chronological distinctions. The summary descriptions below commence with the better-dated Classic Garamantian cemeteries and then turn to the potentially earlier Garamantian (and possibly Pastoral) burial areas.

**TAG001 and TAG012:** two cemeteries stand out in terms of numbers and preponderance of the more sophisticated burial types, TAG001 and TAG012. Although the excavations carried out at these sites are described in detail below, a few comments on the overall morphology are required here. These are the most monumental of the Taqallit Classic Garamantian cemeteries, but have a markedly different character from each other though less than 2 km apart and arguably both

<table>
<thead>
<tr>
<th>Site</th>
<th>Proto stelae</th>
<th>Stone bowls &amp; Proto-offering tables</th>
<th>Classic stelae</th>
<th>Classic offering tables</th>
<th>Tomb types where found</th>
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<tr>
<td>TAG001 (DMP)</td>
<td>1?</td>
<td>-</td>
<td>28</td>
<td>17</td>
<td>5a, 5b</td>
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<td>[cf TAG001 (Daniels)]</td>
<td>-</td>
<td>-</td>
<td>117</td>
<td>57</td>
<td>5a, 5b, 2a</td>
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<td>-</td>
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<td>-</td>
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<td>3</td>
<td>1</td>
<td>4b</td>
</tr>
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<td>-</td>
<td>4 (1 Wf)</td>
<td>-</td>
<td>1b, 5d</td>
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<td>1</td>
<td>1b, 5a, 5b</td>
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<td>1</td>
<td>(2)</td>
<td>-</td>
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<td>-</td>
<td>1</td>
<td>-</td>
<td>1b, 3a</td>
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<tr>
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<td>-</td>
<td>1b, 3a</td>
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<td>-</td>
<td>1b, 3a, 3b, 4a</td>
</tr>
<tr>
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<td>1</td>
<td>1</td>
<td>3b, 4b (Classic 1b)</td>
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<tr>
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<td>-</td>
<td>-</td>
<td>3b, 1e</td>
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<tr>
<td>TAG094</td>
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<td>TAG095</td>
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<tr>
<td>TAG096</td>
<td>28 (1 Wf)</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>3b</td>
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<tr>
<td>Totals</td>
<td>73</td>
<td>15</td>
<td>42 (131)</td>
<td>19 (59)</td>
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Table 2. Distribution of funerary furniture (stelae and offering tables, proto-stelae and stone bowls/proto-offering tables) among the Taqallit cemeteries. Numbers include fragmentary and uncertain pieces. There are notably fewer offering tables, though this may be due to their burial below the modern ground surface. All stelae and offering tables were recorded at the east side of the tombs except where stated as west-facing (Wf). Much material has disappeared from TAG001 since Daniels first worked there in 1959. The numbers in brackets in the bottom row for Classic stelae and offering tables represent the overall totals recorded by the DMP plus the difference between the Daniels’ record and the DMP count at TAG001.
relating to the same sub-group of the local population. TAG001 is morphologically a type 3 escarpment cemetery, comprising two zones of shaft burials ringed by very dense packed rectangular (and other) stepped tombs (Fig. 5). The monumental tombs appear to have been arranged in rows and were generally aligned with long axis running east/west. The numerous stelae and offering tables recorded by Daniels and by us (for stelae and offering table typologies, see Mattingly 2003, 206–13) also illustrate the special character of the cemetery (see Table 2 and Fig. 6). Stelae and offering tables appear generally to have been placed at the east side of tombs and the majority have been broken into by robbers from this side (for possible reasons for this see below). Given the local availability of raw material for producing Classic stelae/offering tables, their absence from many of the Taqallit cemeteries must be significant of either social or chronological differences. The surface pottery (mostly generated by tomb robbing) suggests a long period of use of the cemetery from perhaps the latter centuries BC to the Late Garamantian period. Various finds point to a comparatively late date for the monumental burials, so it may be that the early material goes with the central zone of shaft burials, which seem structurally most likely to precede the monumental tombs that encircle them.

TAG012 is a type 7 oasis centre nucleated cemetery and contains mudbrick tombs including pyramids and rectangular tombs (essentially 4a/4b, though the possibility that some examples were originally of stepped type cannot be excluded). The surface traces mapped in 2000 or visible on kite photos taken this season suggest that some circular drum tombs may also have been present (as in the late phase of Saniat bin Huwaydi, which this cemetery closely resembles). Some of the tombs were accompanied by stelae and offering tables or funerary enclosures on the east side. The finds suggest a Late Garamantian date for the latest phase of the cemetery.

TAG026 and TAG027: these two cemeteries (first recorded in 2000) can be considered as separate parts of a single funerary complex, made up of several discrete zones of dense corbelled tombs and shaft burials (with a total of over 200 burials noted). TAG026 comprises three separate nucleated clusters of corbelled tombs, with a few shaft burials and one or two stand-alone corbelled tombs. The cemetery has been heavily robbed and a
mass of amphorae and other pottery (both wheel-made and handmade) was collected among the rubble of demolished corbelled cairns and on the slopes below. A notable feature here is that there were numerous amphorae in these burials. TAG027 lies just to the west of TAG026 across a small but deep gully. The burial structures here also split into several distinct clusters of corbelled cairns and shaft burials (the latter generally round the fringes of the former). A single type 2a Classic stele was noted on the east side of a corbelled cairn – there may have been others and offering tables buried by the robbing destruction. The pottery from the two sites is fairly consistent, with some sherds suggesting a first-century BC origin, but the bulk of the material probably belonging to the first or early second century AD.

TAG050: on the first ridge to the north of TAG001, TAG050 is a type 4 nucleated cemetery of simple shaft burials. The majority of the 49 shafts recorded were apparently unlined. Pottery was recorded alongside a number of shafts, including Roman amphorae, imported wheel-made and Garamantian handmade vessels – the latter including both painted vessels and ones with impressed exterior and rim decoration. The overall assemblage looks early in the Classic Garamantian period – perhaps in the first century BC to first century AD. No stelae or offering tables were recorded.

TAG021 and TAG051: to the east along the same ridge on which TAG050 sits are two further nucleated cemetery areas, mainly comprised of close-packed corbelled cairns. TAG021 was recorded in 2000 and has produced evidence of both proto-stelae and the Classic Garamantian stelae and offering table sets. Pottery is fairly sparse, but includes amphora sherds and imported coarsewares. TAG051 represents a continuation of TAG021, after a c. 30 m gap, up the higher scarps, with the tombs becoming somewhat more separated from one another. The overwhelming majority of tombs are again corbelled cairns, but featured a predominance of Classic Garamantian stelae, particularly type 5 stelae and some types 2 or 4 stelae (constructed of one piece). Ceramics are fairly sparse, but similar in nature to TAG021. It is likely the cemeteries were broadly contemporary within the Classic Garamantian phase.

TAG055, TAG056 and TAG060: to the north of TAG021/051, the nature of the cemeteries on the upper escarpment slopes was somewhat different, though the corbelled cairn still constituted about 50% of the tombs recorded. Drum cairns and drum tombs (3a/3b) did not exceed 25% of burials in any of these areas. These cemetery areas were probably all part of a single zone (though divided by gullies into a series of discrete areas that explain our sub-numbering system). They were not nucleated and produced little pottery at all (though evidently heavily robbed). Burials in cemetery TAG055 and TAG056 were typically furnished with rough-cut type 1 ‘proto-stelae’ (13) and some type 3 ‘proto-offering tables’ (2). It seems likely that these cemeteries were predominantly of the Proto-urban Garamantian phase.

TAG063, TAG069 and TAG096: to the south of TAG001 and TAG021/051, the higher escarpment cemeteries had a markedly different character from those to the north just described. The proportion of corbelled cairns dropped significantly to between 8–18% only, while drum cairns and especially drum tombs increased to 55–81% of the total in these areas. Moreover, while surface pottery was extremely scarce in what are heavily robbed cemeteries, very large numbers of proto-stelae (54) and stone bowls (12) were encountered (almost invariably on the east side of tombs). Only a single example of a Classic Garamantian stelae and offering table was noted. Again, it seems likely that these drum cemeteries are probably of pre-Classic Garamantian date (i.e. the latter centuries BC).

TAG094 and TAG095: the higher cemeteries at the south-western end of the embayment had another character again, with corbelled cairns the predominant type (41–54%) and drum tombs falling back to only 12–28%. Only two proto-stelae were noted here (in TAG095) in marked contrast to the area of scarp immediately to the east where the highest numbers had been recorded (TAG96).
A few small nucleated clusters of corbelled cairns and shafts produced Roman/Garamantian pottery and seem to be contemporary with the larger nucleated cemeteries at this end of the embayment (TAG026/027).

TAG006 and TAG0054: these numbers were applied to the lower slopes of the escarpment in two blocks, TAG006 relating to the area south of TAG001 and TAG0054 that to the north. Both areas look very similar in topographical terms and both produced quite large numbers of simple cairns (types 1a and 1c – almost 50% of all tombs in both cases). If we are correct in suspecting that these types may be comparatively early, it would appear that both TAG006 and TAG0054 were morphologically similar initially, with dispersed spreads of simple cairns. However, there are significant differences between the two areas in terms of the types of tombs that we believe were subsequently introduced into this funerary landscape. In the southern area of TAG006, the second most important type was the 3a drum cairn, while in the northern TAG0054 sector it was the corbelled cairn and the crevice cairn. This difference can in part be correlated with similar discrepancies in the composition between the higher escarpment cemeteries described above. Overall, both areas seem not to have evolved much beyond the level of dispersed cemeteries, although they contained some prestige tombs alongside the abundant simple cairns. Both areas produced a few examples of really extraordinarily large drum or rectangular tombs with multiple chambers or clusters of drum and rectangular tombs that had been built against each other in large numbers (up to 13 burials in a block). Once again, further work is required to elucidate the structure and date of these multi-celled drum and rectangular cairns. However, these monuments seem to echo the clustering of corbelled tombs and shaft burials and to be an initial stage of cemetery nucleation (there are similar features in the Watwat area at UAT013, see Mattingly 2007, 111–12, UAT013.76).

Foggara excavation and survey
By Andrew Wilson

Work by the Fazzan Project in 1997–2000 had established that the numerous foggara irrigation systems in the Wadi al-Ajal were constructed in the Garamantian period and allowed the development of oasis agriculture that enabled the emergence of a Garamantian state (Wilson 2006; Wilson and Mattingly 2003). This conclusion was based on the general spatial relationship of foggaras to Garamantian settlement, confirmed in a few instances by the observation of Garamantian tombs apparently overlying foggara spoil rings (ITF002; TAG008), and in one case a settlement (FJJ001) with ARS overlying a foggara spoil bank (Wilson and Mattingly 2003, 263). However, closer dating had proved impossible without excavation of such stratigraphically associated features. The objectives of further investigative work on the foggara systems in 2009 were therefore to improve understanding of the spatial relationship of foggaras in the Taqallit area to cemetery and settlement sites, and to try to provide a closer dating for some of the foggaras. This was attempted in two ways: first, through the excavation of two tombs associated with and possibly overlying foggara spoil rings in the Taqallit region, and second, by attempting to obtain samples for AMS dating from organic inclusions in the mudbrick lining of the shafts of two foggara systems, one on the east side of the Taqallit promontory (at ELH013) and the other at Ad Tamalalat (TMT003). Further survey work was carried out on the group of foggaras (TAG008) on the west side of the Taqallit headland.

Several of the foggaras of the TAG008 group had complex systems of tributary branches in their upstream sections and splitting channels visible in the downstream portions. Some of these foggaras were investigated on the ground, in order to understand these systems, investigate their relationship to the cemeteries TAG001 and TAG012, and locate the settlements associated with them. Foggaras F200 and F207 of this group, with their tributaries F201 and F202 were investigated in detail, and more cursory surveys made of the upstream parts of F203, F204, F205, F206, F208 and F209 (Fig. 3).
F200: foggara F200 originates in a steep rocky gully among the drum cairns of cemetery TAG006. Shaft 11 lies adjacent to the cairn TAG006.T1 (see below). This shaft, whose mouth is partially choked by collapsed stones from the tomb, was 24.7 m deep to the present fill. At shaft 13 a branch (F201) departs from it to feed F207, presumably a later alteration to the system aimed at augmenting the discharge of F207 after the main downstream portion of F200 had fallen into disuse. The foggara then diverges from the line of the gully, tunnelling under a spur of the hillside. Beside shaft 14 is a rock with a Libyan inscription on it (Mattingly 2003, 264 fig. 7.25a). Shafts 17–20 were still partially open and measured as 10 m, 14.7 m, 10 m and 10 m deep to the present fill respectively. Next to shaft 28 was a cairn tomb which has either been despoiled for material tostein the upper part of the shaft, or has been robbed with the stones thrown into the largely filled foggara shaft. From shaft 44 the shafts are so close together that the spoil rings become contiguous, presumably because the foggara at this point runs through unstable geology and the digging teams were keeping the gallery sections as short as possible. At a point between shafts 55 and 57 the foggara appears to have split; it seems that the westerly branch, F200-A, was probably the original one as it continues in a straight line. The easterly branch, F200-B, has the largest and most prominent spoil heaps, presumably because it was in use for longer, but the way in which it deviates from the course of the shafts uphill suggests that it was not the original line, and was presumably dug after irremediable collapse of the channel of F200-A among the soft palaeolake deposits further downstream.

F200-A: the early section of this seems to be destroyed by wadi wash and bulldozing; the first traceable spoil rings are low and contiguous. North of the old al-Ghrayf to Ubari track the line of the foggara is still traceable but becomes progressively less distinct. However, a short distance north-west of the last traceable point of the foggara, and on its projected course, lies a nearly square masonry structure TAG080 with a single course of stones visible at ground level delimiting a building c. 17 x 19 paces externally, and with traces of internal wall lines (Fig. 7a). No pottery was visible on the surface, but the structure may be the remains of a small qasr. A little further to the north is a low area of decayed mudbrick, TAG081. Several fragments of coarse handmade wares and one reduced fired Tripolitanian amphora sherd were collected from the surface. Close by to the west are two mounds of decayed mudbrick, TAG082, with parts of a wall line visible at the top of the eastern mound. A broken upper stone from a hand quern (SF538) and sherds of handmade wares and Roman amphorae were collected. To the north lay a large extent of mudbrick, TAG083, with some wall lines visible at ground level, and handmade wares and Roman amphora and ARS sherds.

The sites TAG081–TAG083 are evidently of Classic Garamantian date and together with TAG080 would seem to be settlements associated with the outflow of the foggara F200-A. If the masonry structure TAG080 is indeed a qasr, it would seem to have protected the end of the foggara line, from which water was presumably distributed in open channels.

F203: this is a complex system, with three tributaries near the escarpment eventually feeding into a single foggara in the plain. The western tributary, F203-A, starts to the east of F204. Immediately after the mother well, there is a double-shaft cut through rock, surrounded by a very large and elongated spoil ring; close to this was a sherd of handmade (Garamantian?) pottery, and on the sandstone exposed bedrock of a small gully immediately next to the shaft are a group of several Libyan inscriptions. Shaft 3 is also very elongated, and this tributary then joins the next tributary to the east, F203-B, at another elongated shaft. F203-B starts higher up the hillside and is a longer branch than F203-A, joining it at shaft 17. Shaft 8 is steined, and shaft 11 is rock-cut from the surface. The shafts immediately before and after the junction with F203-A are again elongated in plan, and cut through rock from the surface. Beside the fifth shaft after the junction lies a stone slab with a Libyan inscription. Further to the north, another long tributary (F203-C) feeds in from the east, which originates between F203-B and F202. In the upper reaches of this are two rock-cut shafts with opposed footholds visible in the long sides (Mattingly 2007, 69).
**F204:** this foggara originates a short distance to the south of the west spur of the Taqallit headland, among the drum cairns of cemetery TAG005 at N26 32.287 E12 52.793. It tunnels northward under the ridge of the western spur, and the rock-cut shaft at the crest of this ridge has a Libyan inscription in the side of the shaft that could only have been cut during the digging of the foggara (Fig. 7b). The spoil from the shaft partly overlies a drum cairn.

**F205:** foggara F205 starts in the cairnfield TAG005 on the west side of the Taqallit promontory, heading north-north-west before turning north-west into the plain away from the escarpment. Shafts 2 and 3 are steined. Beyond shaft 31 the foggara is cut by a wadi, but continues after this into the plain to the north-west.

**F206:** originates in the cairn cemetery TAG004, with a pair of tributaries joining in a V-pattern about halfway along the west side of the Taqallit headland. Between shafts 3 and 4 is a drum cairn which, when visited in 2000, was thought to overlie the spoil rings of the shafts (Wilson and Mattingly 2003, 262 fig. 7.23b; Mattingly 2007, 69), but on re-examination is probably partly overlain by them, and thus earlier than the foggara. At shaft 12 is the junction with the southern tributary, and the main foggara line runs north-west towards the plain.

**F207:** foggara F207 is fed by two tributaries joining in a V-shape. The western tributary was numbered as F202 and the eastern one, which is the cross-link from F200 mentioned above, as F201, with the main foggara channel after the junction numbered as F207. Two interpretations of the surface evidence are possible: (1), that the foggara in its original phase originated at the point which is now the junction with the tributaries, and that both tributaries were added subsequently at more or less the same time, forming a roughly symmetrical arrangement which included the capture of the headwaters of F200; or (2), that the foggara originated in the gully at the head of F202, and that the feeder F201 which captured the headwaters of F200 was a subsequent addition. In either case the alterations were intended to increase flow in F207, either as a response to a falling water table or because the difficulty of maintaining the downstream sections of F200, with its numerous recuts (F200-A to F200-D), proved ultimately too much and F200 was abandoned.

The west tributary F202 starts in a steep rocky gully among cairns of TAG006. Shaft 2 is cut between two tombs, and its spoil overlies them. A large rock with several Libyan inscriptions forms the edge of one shaft (Wilson and Mattingly 2003, 264 fig. 7.25b). The last shaft of this tributary was measured as 27.7 m deep to fill.
The east tributary F201 departs from F200 (see above). Shaft 1 is choked but shafts 2 and 3 were measured as 12 m and 7.90 m deep to fill respectively. Both of these were cut through loose sandstone boulders and wadi wash deposits, and then below this through sandstone, with shafts rectangular in plan and with opposed footholds cut in the long sides. The orientation of the shaft plan rotates in a corkscrew fashion as the shaft goes down, possibly to assist climbing in and out (Fig. 7c). Shafts 4 to 6 are again filled; the tomb TAG006.T2 whose excavation is described below lies adjacent to shaft 5.

The tributaries join at a shaft whose depth was measured as 25.1 m; from this point the foggara runs along a low ridge between two gullies. Seven shafts in this sector were measured as between 16 m and 24.3 m deep. The line of the foggara is cut by the old al-Ghayrif to Ubari road and further north-west large mounds of mudbrick or palaeolake upcast seem to define a possible open channel bypassing the original line of the foggara for a short distance to the east, perhaps after the main channel collapsed at this point. Including the tributaries and given the slightly winding nature of the foggara’s course, its total length must have been c. 2 km, with shafts every 5–10 m.

Further to the north-west, a little to the west of the projected line of F207, an area of mudbrick mounds and pottery scatter denotes a settlement, TAG084. Abundant pottery included handmade wares and Roman amphora sherds (eight different fabrics), two Roman coarseware sherds and a cooking pot lid, perhaps from southern Tunisia. The cooking pot lid was found close to the lower stone of a sandstone rotary quern (SF539). Somewhat to the south of TAG084 is a small square enclosure of decayed mudbrick, TAG085, again with Garamantian handmade and Roman pottery, including one amphora sherd and two coarseware sherds, all in Tripolitanian fabrics. Both TAG084 and TAG085 appear to be sites of Classic Garamantian date associated with the end zone of foggara F207.

F208: the foggara starts in the north side of the west spur of the Taqallit headland, between F204 and F205; after shaft 23 it is cut by a wadi, and continues into the plain to the north-north-west.

F209: begins near the escarpment foot to the east of the cemetery TAG001. It is initially visible as spoil rings but then the line is lost for a while among gravel deposits where the surface traces have been washed out by wadi runoff erosion. The line of the foggara then becomes visible as several parallel banks of spoil running up to and beyond the old al-Ghayrif to Ubari track. These seem to represent areas where the roof of the subterranean gallery has collapsed and the tunnel has been recut immediately alongside, and then the process has repeated itself, so that the foggara migrated successively eastwards. This suggests a similar set of problems in the unstable geology of the edge of the plain to those encountered with foggara F200.

Several key points emerge from the ground survey of foggaras in the Taqallit region. First, because in this part of the Wadi al-Ajal the modern road and associated modern agricultural development lie somewhat to the north of the outflow zone of the foggaras, the ancient landscape is better preserved and clearer indications survive here of the relationship between foggara systems and ancient settlements than they do in much of the rest of the Wadi al-Ajal. Both of the foggara systems which were traced to near their ends (F200 and F207) were found to terminate close to sites yielding imported Roman pottery and handmade pottery of probable Garamantian date; these are presumably the settlements that went with the foggara systems, and provide indirect but highly suggestive evidence of a Classic Garamantian date for the main period of use of these foggaras. Secondly, the foggaras are later than the drum cairns, as indicated by upcast foggara spoil against some of the drum cairns, and confirmed by the stratigraphic excavation of the relationship between two such tombs and foggara spoil rings described below. Thirdly, four of the foggaras in this area (F200, F202, F203 and F204) have Libyan inscriptions on rocks carved by shafts towards the head of the foggara – and in one case (F204) actually within the shaft. Although certainty must await decipherment of these inscriptions, it seems very likely that they relate in some way to the foggaras, perhaps either recording ownership or water rights, or commemorating the digging crew or the breakthrough into the aquifer during construction.
AMS and OSL dating of mudbrick material from foggara shaft linings

During the 2000 season of the Fazzan Project two foggaras had been noted which showed evidence of shafts revetted with mudbricks. These offered the hope that if organic inclusions could be found within the mudbricks, they might provide AMS dates for the construction of the foggaras, in the same manner as had been tried for the qsur. In addition, OSL dating might be possible from the sand contained within the mudbricks. Accordingly, the two foggaras (ELH013 and TMT003) were sampled by excavating shafts to a depth of 1 m and removing pieces of the mudbrick lining. The samples from ELH013 intended for AMS dating were dissolved in water and the flot wet-sieved through a 1 mm mesh, yielding a number of carbonised plant fibres. Samples of mudbrick lumps from the fill of TMT003 were broken up on site and not found to contain any organics; three further large lumps from the fill, and three taken from the intact lining, were pulverised back at the excavation base and passed successively through 4.0 and 2.0 mm sieves; they were entirely free of organic material and it was not therefore possible to obtain AMS dates. Two large pieces from the intact lining were taken for OSL dating.

The Cemetery Excavations: TAG012, TAG001 and TAG006

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TAG012 (MH, with DM, IR)

Initially a 15 m x 15 m area of the TAG012 mudbrick cemetery was excavated. A total of 12 tombs was identified lying wholly or partially within the area (Fig. 8), and a 3 m extension was added to the east, in order completely to include a large rectangular tomb (T7). All the tombs were constructed with square or rectangular mudbrick platforms, and either circular or square-built burial shafts. The cemetery appears to have been comprehensively robbed, with most tombs having visible robber holes cut through their tops. Others appear to have been entered by tunnelling through their eastern sides (T2 and T7) where offering tables and stelae may have sat. A particular feature of the cemetery appears to have been the use of gypsum for the stelae, visible on T1, T3 and T7. Three tombs in particular stand out as they yielded significant assemblages of both human bone and artefacts (T2, T3 and T12). All the human bone was fully or partially disarticulated and mostly came from the fills of robbing events. Three skeleton numbers were assigned: SK636, SK634 and SK647, from T2, T3 and T12 respectively. The three most significant tombs and their assemblages are described below.

Tomb 2: the monument stood out from the rest of the tombs in the area because its square platform lay beneath a large mound of collapsed mudbrick. It is therefore the best candidate of the tombs within the area for having had a significant superstructure, perhaps a pyramid. The tomb had obviously been comprehensively robbed, with the robber cut entering in the centre of the east side of the tomb at the point where an offering table and stelae may once have been positioned. From the fill of the shaft (633), pottery fragments of a painted incense burner (SF511, similar to one found in T3) were recovered along with 36 beads (mostly retrieved by systematic sieving) of various materials, including amazonite, carnelian and glass. In addition, several small fragments of vessel glass were retrieved.

The skeleton (SK636) was disarticulated and incomplete. The bone was very fragmentary although the cranium (displaying evidence of iron deficiency in its orbits) and several long bones were in reasonable condition.


Dimensions: 6.5 m x 6.25 m, circular shaft 2 m in diameter, depth of shaft 1.6 m.

Tomb 3: this structure had a square mudbrick platform, with a stone offering table and gypsum stelae in situ on its eastern side (Fig. 9a). The tomb had suffered an obvious robbing event [630] truncating the southern side of the shaft, and disturbing the skeleton. Sherds of a painted ceramic
incense burner (SF420, similar to the fragments found in Tomb 2), fragments of bone, and a cranium (SK 634, which had suffered a trephination) were recovered from the fill (631) of the robber cut. The original cut of the shaft [637] was found to be square in shape, and where its fill (638) survived intact at the northern side of the shaft it contained (Fig. 9b) a large Tripolitian 1 amphora, type AM 27 (SF510), a large stamped, incised plate with an oxidised fabric, probably Tripolitian (SF508), an amphoroid flagon (SF507), and a glass rhyton (SF509), similar to that found in Tomb 12. The finds suggest a date in the fourth–fifth centuries AD.

Dimensions: 5 m x 4.1 m, square shaft 1.5 m in diameter and 1.48 m in depth.

**Tomb 12:** this was a small square tomb found directly beneath the large rectangular platform of T7. The difference in alignment and depth of burial (below the foundations of T7) suggest that this may be an earlier tomb. However, it is not ruled out that it is in fact a deep burial chamber associated with the large platform identified as T7. If the two structures are contemporary, there is an interesting element to their construction in that they are differently aligned (also a feature of T3). The grave goods from the tomb (Fig. 9c) included a Tripolitian amphora type AM 26–7 (SF519), a squat ring-base amphora with shoulder decoration (SF518), a flagon made from a fine oxidised fabric (SF516), another glass rhyton (SF517, see Fig. 17), several fragments of handmade pottery, two fragments of metal, perhaps a bangle (SF520) and a couple of iron rivets found in association with
the rhyton (SF522). The radius of the skeleton displayed a healed fracture. The finds suggest a date in the fourth – seventh centuries AD.

Small Finds: 516, 517, 518, 519, 520, 521, 522.

Dimensions: 2.3 m x 2.4 m, diameter of square chamber 1.8 m, depth of chamber 1.2 m.

The cemetery at TAG012 displayed some similar features to Saniat bin Huwaydi, consisting of mudbrick tombs generally with square- or rectangular-built tombs or platforms on which pyramids or stepped monuments may have been erected. The preferred orientation of the tombs was east-facing. Where blocks of gypsum were found at TAG012, used as stelae and perhaps in some cases functioning as offering tables, they were located at the eastern side of the tombs (T1, T3 and T7). Also, T2 had obviously been entered from the eastern side, the robbers breaking in at the location where the stelae and offering table may once have been. The two tombs (T3 and T7/T12) with square burial shafts displayed a difference in alignment between the orientation of the shaft and that of the platform, which may prove to be significant in a larger sample.

T2 and T3 both had similar painted incense burners. T3 and T12 each had a Tripolitanian amphora, types AM 26–7, a conical glass rhyton drinking cup and an amphoroid flagon. Apart from one unstratified bead found on the surface east of the site, all beads came from T2. From the excavations, this appears to be a Late Garamantian cemetery, with diagnostic finds concentrated in the period fourth to fifth centuries AD (and possibly later). It is possible that further excavation may uncover earlier phases of burials that are more deeply buried in the mound, as was the case at Saniat bin Huwaydi.

TAG001 (MGR, with SB, AR and DM)

Excavations at TAG001 in 2009 commenced with the definition of three initial areas for detailed examination in different parts of the site. These areas were targeted due to the fact that each had been damaged by modern bulldozing: Area 1 at the northeast side of the site, Area 2 at the south-east and Area 3 in the centre of the larger demolished area. Two more areas (relating
to the shaft burials) have been identified for examination and pre-exca
vation vertical photographs taken, but no further work has yet been done in those areas (Fig. 10).

Area 1: three tombs have been excavated in Area 1 on the north-east side of the main site. This area has been severely damaged by bulldozers (evidently demolishing superstructures for building stone) and a significant amount of human bone was recovered from the surface during the initial cleaning stage. Two sub-rectangular slab-lined funerary chambers were recognisable from the surface (T227 and T228) and a third one (T231) was discovered after the removal of demolition on the western side.

Area 2: area 2 is a small area south of Area 1, on the northern margins of the area of extant monumental tombs. Only one tomb was excavated (T229) and another one has been prepared for excavation in 2010.

Area 3: the main area of excavation during the 2009 season was in Area 3 in the centre of the site where a significant amount of damage had been done by bulldozing in an area where Daniels had recorded standing rectangular stepped tombs (type 5b). The superstructures had been cleared away entirely, but cleaning of the surface revealed traces of the subterranean funerary chambers, generally rectangular, sub-rectangular or sub-oval, aligned east/west and on average measuring c. 1.5 by 1 m by 0.80–1 m deep. A 10 by 15 m grid was established in an attempt to sample a variety of tombs. Most of the tombs had been robbed from the east side in the past, but the precarious nature of the stepped stone superstructures had often prevented full cleaning out of the burial chambers by the robbers. It appears that in this cemetery the heads of the deceased were generally placed towards the east and while we found that the east end of each chamber had usually been thoroughly ransacked – presumably in the search for beads – the pelvis and legs of many skeletons
were still articulated and undisturbed. Seventeen tombs have been excavated, of which five were backfilled at the end of the season to be continued in the future. The initial clearing of the area recovered a diverse range of pottery, both in chronology and style. Brief notes on a few of the most interesting burials are given here.

Tomb 237: the tomb comprised a sub-circular lined chamber, relating to a heavily truncated monumental tomb (presumably stepped) that had been reduced by robbing and bulldozing to only a few surviving stones at ground level. The grave was visible in a sandy deposit at the surface. In the robber fill (1070), fragments of disarticulated human bones, often in clusters, started to appear, suggesting the tomb had been robbed. Several fragments of thick skull bones were found to the north-east side of the grave. A few beads (SF563, SF579, SF580 and SF581) were also recovered from the robber backfill.

After the removal of the robber fill, about 50 cm from the ground level, a much denser and firmer fine sandy deposit was exposed (1031). The articulated legs and pelvis of the skeleton (SK1051) appeared in situ and undisturbed by the robbing. Both legs were flexed, with the knees pointing north and the feet parallel to each other, going slightly upwards and pointing west. It was possible to assess the position of the body as crouched, and lying on its right side facing west, with the now-missing upper part of the body originally in the north part of the grave. Two stones from the original stone lining (1067) were also recovered in situ. In the tomb fill (1031) two fragments of an incense burner were recovered (SF564 and SF575). Further removal of tomb fill (1031) revealed surviving woven fabric, poorly preserved but in situ and possibly green in colour, suggesting the body was wrapped in fabric. Only a few small fragments of this fabric (SF567) were in a condition to be sampled for further examination. A few fragments of this textile were clearly visible on the bones. The textile was found covered with insect remains and a large amount of dark brown organic matter. The exposing of the textile proceeded from west to east side of the grave, as that seemed to be the major orientation of the surviving textile fibres. To the east side of the legs, the undisturbed skeleton of an infant (or neonate) was uncovered. The skeleton of the infant (SK1065) was found complete, crouched on its right side, with both arms and legs flexed and the head pointing south-east. It too was wrapped in textile, but it was not possible to establish if the female adult and child were wrapped together or separately. Around the infant remains, the tomb fill appeared purple black and dusty, possibly consisting of organic matter highly decomposed. Further cleaning at the east edge of the grave, revealed a coarse ‘straw’ matting (possibly fibres of Juncus sp.), which was badly preserved, but a few surviving fragments were sampled (SF568) for examination and comparison with other graves. At the north side of the adult’s pelvis, just above the area of the sacrum some beads appeared in situ, still with the thread inside them. The beads were held in situ by the sandy tomb fill, presumably solidified in the base of the grave by decomposition products (1031), and this made it possible to expose in situ three separate chains of beads running around and below the hips (Fig. 11; cf. Fig. 15a). These bead chains had escaped the attention of the grave robbers because they were worn around the hips of the body, far from the area of the neck, where it is possible that additional necklaces were worn. It was decided to reconstruct the chains in the exact way in which they were made. In order to do so, the chains were exposed on site, and lifted bead by bead and numbered progressively from west to east. The excavation continued by removing the bones of the adult and child and the surviving fabric, in order to expose the matting, which appeared very poorly preserved. At this stage the tomb fill (1031) appeared very dark and rich in organic matter especially under the area of the pelvis. This part of the fill also had a large amount of insect larva cases, and was fully sampled for analysis (sample <47>).

Tomb 239: this was a sub-rectangular tomb chamber disturbed by robbing, with the grave cut and the lining structure of the grave damaged to the north and north-west sides. Almost immediately below the ground level, a cluster of thick skull fragments was found in the central and southern part of the grave along with a large number of disarticulated human bones, mostly in fragments.
Several beads (SF591) and fragments of an incense burner (SF592) were recovered from the fill (1094). In this instance the robbers had failed to recognize the presence of a second burial directly below the one they disturbed. Under the collapsed stone lining of the shaft (1096) a circular impression of an organic object was exposed along with four short fragments of a bead chain, which seemed to be arranged in two loops, and a longer segment which ran around the circular outline (SF583, SF584, SF585, SF586). Most of the ‘bag’ was too fragile for lifting but a small fragment was recovered. The fragment consisted of gourd and had a few holes (SF590), possibly for attaching the bead chains. It is also possible that the fragments belonged to a longer chain, possibly broken during the robbery, as a large number of similar beads were recovered from the robber fill. In the more compacted fill in the base of the robbed grave (1097) a second skeleton was then exposed (SK1099), still within the same subterranean funerary chamber, suggesting that this was originally a double burial. At the north-west side of the body, a wooden bowl (SF587) was recovered, c. 25 cm in diameter and c. 10 cm deep. It was located north of the left knee and very close to the head. Most of the bowl fragments were deteriorated and showed damage from insects. Some fragments of the bowl were preserved and lifted for examination. SK1099 was a crouched male adult burial, lying on his right side with the head north and facing down towards the chest. The back was curved against the rock, with the ribs completely collapsed. The left arm was flexed with the hand under the skull and the fingers extended. The right arm was also flexed but to a lesser degree than the left arm, with the right hand found under the pelvis, again with the fingers extended. Both legs were flexed and appeared pushed against the chest with the knees close to the head and pointing north. Both feet were found in situ, parallel to each other towards the west. All bones, especially the vertebrae, the hands and the feet, had a great deal of surviving organic matter, which kept several small bones of the hands and some vertebrae still articulated at the moment of lifting.

Textile remains were also recovered at the top of long bones and the chest area and it was possible to collect a few fragments for analysis (SF589). The textile appeared to be green in colour, a few fragments were also purple, but the colour faded away shortly after exposure to light. On the western side of the grave a few smaller stones were found lining the grave cut. One of these stones appeared flat at the bottom of the grave, close to the left side of the knee and seemed to be deliberately put in that position. The original fill of the tomb (1097) had a layer of insect larva cases 3 cm in depth, which was sampled for analysis (sample no.48). Below this layer of insect cases some fragments of surviving coarse matting (possibly fragments of Juncus sp.) were recovered and sampled (SF588).
**Tomb 242**: the tomb comprised a rectangular chamber, measuring 1.50 m by 1.00 m by 0.47 m, robbed and damaged by machining. The robbing [1103] had destroyed the northern and western side of the tomb lining. However, the remaining lining was formed by large vertical slabs in the east, north-east and southern sides. Within the robber fill (1102) a significant amount of disarticulated human bone was recovered belonging to two different individuals, an adult and an infant. Most of the disturbed remains of the infant were located on the east side of the tomb. The disturbed skull of the adult was recovered from the north-west side, by which some ostrich eggshell and glass beads were found. Remains of an adult were recorded within the original tomb fill (1104). The remains were heavily damaged by the robbing. However, the falanges of an undetermined hand and few vertebrae along with the tibia and feet were excavated *in situ*. The position of the vertebrae and feet suggests the body was orientated east/west, with the head to the east, possibly facing north. Some ostrich eggshell and blue glass beads (SF594) were recovered from the east side of the tomb along with a small necklace (SF595) found on a flat stone next to the remains of the infant.

**Tombs 243 and 244**: T243 was a rectangular tomb chamber, measuring 1 m by 0.72 m by 0.83 m. This tomb had been robbed [1101] and subsequently damaged by modern bulldozing. The shaft was lined with large vertical slabs (1115). The sandy robber fill (1100) contained disarticulated disturbed bone along with sherds of a pottery plate. Some surviving articulated bone in the original tomb fill (1108) was recorded *in situ* (SK 1107).

Immediately below what remained of SK 1107 and the fill (1108) was the articulated remains of a second burial, that of a female adult (SK 1112). As the bones of this burial ran under the vertical slab lining of the chamber for tomb T243, it was clear that SK 1112 was in an earlier grave/tomb T244 [1114]. The skull of this skeleton had been disturbed, presumably when the secondary burial had been constructed, but the skeleton was otherwise undisturbed and in good condition. It was found with a carnelian and glass necklace (SF593 = Fig. 15b) around the neck and two beaded belts around the waist (SF597 and SF598), and a complete flagon (SF596) had been placed south-west of the pelvis. The excavation of the necklace and beaded belts was carried out in a similar way to T237.

The excavation of robbed tombs in TAG001 has highlighted a pattern in the robbing. Most tombs, if not all, had been robbed from the east side, where the skull most commonly was placed. This suggests the possibility of the robbers knowing the likely orientation of the burials, targeting the areas where bead necklaces were more likely to be found. This could explain the fact that most of our articulated skeletal remains in this season have consisted of the lower part of bodies, or even just the feet, and the finds remaining are the ones located by the feet or the lower part of the skeletons. Some of the best preserved burials were also unusual instances of superimposed or double inhumations, where the robbers failed to recognise the existence of the lower burial.

**TAG006.T1 and T2 (AW and AR)**

Two tombs in the cemetery TAG006 were excavated to investigate their stratigraphic relationship to the spoil rings of foggaras of the group TAG008 with which they were associated.

**Tomb TAG006.T1**: the first tomb, TAG006.T1, was an oval drum cairn (type 3a) towards the head of a gully within the TAG006 cemetery. It was associated with the spoil ring surrounding shaft 11 of foggara F200 of the group TAG008, and was excavated in the hope that a date obtained for the tomb would provide either a *terminus post quem* or a *terminus ante quem* for the digging of the foggara. The cairn measured 4.32 m north-west/south-east by 4.0 m north-east/south-west, and at the edges originally stood 0.75–0.90 m above the original ground surface, but it was buried to a depth of 0.30 m on the north-west side by the foggara spoil. The edge of the cairn was built of three courses of stones, with smaller stones piled over the centre of the cairn (sample dimensions: 0.54 m by 0.34 m by 0.16 m; 0.68 m by 0.37 m by 0.09 m; 0.45 m by 0.29 m by 0.15 m).
Removal of the cover stones exposed the fill of the grave proper, clean loose light yellowish brown windblown sand with lenses of purplish coarse sand (905). The upper part of the fill produced nothing except a few rodent bones and desiccated maggot larva cases, but in the lower part, directly above the skeleton, fragments of vegetable fibres (cf. *Juncus* sp.), presumably from matting, and leather (SF525) were recovered.

The body (SK906) was flexed, lying on its right side, aligned at 50 degrees from north, the head facing north-west and downwards. The preservation of the bone was good, but the ribs were very fragile and the left side (ribs and arm) had collapsed onto the right side which lay underneath. Both arms were flexed with the hands close to each other with fingers extended and the palms of the hands towards the face. Both legs were flexed, with the knees pointing north. The feet were found parallel and very close to each other, with the toes bent upwards against the side of the grave, suggesting that the body had been crammed into the basal surround of the cairn structure. The back had been placed close to the edge of the burial structure, with more space left to the north-west of the body, where more of the leather garment or shroud still survived *in situ*. A date stone (SF526) was also recovered from this area. On some of the long bones of the arms and the legs small fragments of skin still adhered to the bones. The skull and the pelvis indicated that the skeleton was that of an adult male.

Once the bones had been lifted another rich organic layer was found below the area of the body, consisting of leather fragments, decomposed matter from the corpse, and abundant desiccated maggot larvae, much smaller than the cases above the body, and a few fragments of insect wings (cf. *coleoptera*). The presence of maggots, larva cases and insects suggests that at least one full life cycle of the insect was completed in the tomb.

The remains of the leather wrapping or shroud SF525 were very abundant and best preserved around the area of the neck, chest and in general on the north-west side of the burial. From the arrangement of the fragments it was possible to see that the humerus of the left arm was wrapped tightly against the chest, while the ulna and radius were separately wrapped, perhaps by a second fold, suggesting that the shroud was wrapped around the left forearm, across the right chest and probably the right upper arm, and then around the back and over the left shoulder and left upper arm.

The results of AMS dates for the date stone (SF526) and samples of the leather (SF525) are awaited, but the lack of artefacts or grave goods apart from the fragments of leather and matting suggests that the tomb is unlikely to be later than the first century BC, after which imported goods from the Mediterranean became common in graves in the Wadi al-Ajal; and it may be considerably earlier.

To determine the relationship between the grave cairn and the foggara, a sondage (1.57 m by 0.45 m) was cut through the foggara spoil ring immediately to the north-west of the cairn. This established that the foggara spoil overlay the basal stones of the cairn, which was built directly over the natural orange sand (921). The foggara spoil layers consisted, from bottom to top, of light greyish white sandstone (920), purplish grey sand (919), and then finally light brown sandstone pebbles and stones (918). The tomb is therefore definitely earlier than the foggara. Within the lowest level of the foggara spoil was found a patch of carbonised palm fibres, AMS dating of which may provide a date for the foggara construction activity.

Tomb TAG006.T2: the second tomb to be excavated, TAG006.T2, was also a type 3a oval drum cairn, adjacent to the spoil ring of shaft 5 on the feeder tributary F201 of F202, which appears to have been dug as a means of augmenting the flow of F202 by capturing the headwaters of F200, presumably entailing the disuse of the latter. The cairn was built of dark grey patinated stones, mostly sandstone. It measured 4.30 m north-west/south-east by 3.80 m north-east/south-west. On the east side the edge of the cairn had been disturbed, and a hollow in the top had been caused by disturbance to the upper stones of the cairn, and the tomb appeared at first sight to have been robbed. On the south side, however, the edge of the cairn was well preserved within the foggara spoil ring, built of three courses of stones. Originally the edge would have stood c. 0.54 m above the ancient ground.
level, although in places it is now covered by spoil from the foggara. From the edge the cairn rose gently towards the centre, with small stones covering it.

Excavation commenced with the removal of small stones (910) that lay within the central depression in the top of the cairn. Beneath this was a layer of blown sand and small stones (911), overlying what appeared initially to be intact cover slabs (912). The grave robbers who disturbed the cairn had presumably given up when they reached these slabs. After dismantling the top of the cairn to define the edges of the grave chamber, excavation of the fill (916) commenced. The majority of the skeleton (SK917) was intact and in situ, aligned 260° with the head to the west facing north. The body lay on its left side in a crouched position, with the legs flexed and knees and hands very close to each other, the knees pointing north-west. The left humerus was flexed, crossing underneath the right ulna and radius at the level of the left elbow, with the left forearm crossed above the right wrist, and the fingers of the hand extended towards the face. The skull was tilted slightly upwards against the side of the grave. The neck appeared unusually long. The right foot was well preserved with all bones still in situ, flexed up hard against the left pelvis; both feet were jammed against the side of the grave chamber, toes pointing upwards. The long bones of the legs are unfused, suggesting a juvenile.

The body had been wrapped in a leather shroud or garment, fragments of which remained over and under the body. The arrangement of the arms and such folds of leather as could be distinguished suggested that the body might have been wrapped while lying straight, perhaps with the arms folded across the chest, and then flexed into a crouched position for insertion into the grave; this would explain the attitude of the arms. Twenty-eight tiny cobalt blue faience beads (SF532) were found in situ over the leather close to the left ankle, and another 43 (SF529) were recovered from the fill in the area of the ankles. Thirteen more (SF530) plus one black glass bead (SF531) were found in situ on the left arm just below the wrist; these had been sewn onto the leather with animal gut thread, part of which survived. Directly behind the skull was found a ground-down cowrie shell (SF528). Once the skeleton had been exposed the fragments of leather shroud were lifted, and underneath these and immediately in front of the lower mandible was a haematite lip plug or labret (SF527) (Fig. 12; cf. Fig. 16). The skull was lifted entire, since the mandible was still articulated, and samples for DNA and isotope testing were taken in the laboratory. Patches of skin and hair survived on the left side of the skull. Beneath the skull, in the area of the neck, were beads of a necklace: 12 cobalt blue faience beads (SF533), 1 black ovoid glass bead (SF534), 1 oblate yellow/green glass bead (SF535), and 1 faceted tubular carnelian bead (SF536). A single date stone was found in the area of the pelvis and taken for AMS dating. Although the skeleton cannot be reliably sexed because it is a juvenile, the items of personal adornment (necklace, lip plug, and beads sewn onto the leather wrapping) would appear to suggest a female.

A small trench was cut through the foggara spoil ring against the south-west side of the cairn to establish the stratigraphic relationship between the cairn and the foggara. This showed a sequence, from bottom to top, of: natural sand (915); a single layer of black patinated small stones representing the ancient (and outside the trench, the present) ground surface; the kerb of the cairn directly overlying natural (925), and then in turn overlain and abutted by spoil from the foggara — a layer of purple-grey sand 10–15 cm thick (914), and then a thin layer of light brown sandstone cobbles.

Figure 12. TAG006.T2. Skull with lip plug in situ.
and pebbles (913). The cairn therefore pre-dates the foggara tributary branch F201 whose spoil ring abuts and overlies it.

As might be expected, the two burials excavated within these cairns of the same type showed a number of similarities; both bodies had been wrapped in leather, buried in a crouched position within the grave chambers and both produced a single date stone, perhaps an offering placed on the body as part of the funerary ritual. Neither grave chamber had been backfilled before closure; the fill had accumulated gradually as sand blew in between the stones of the cairn, which would have allowed the completion of insect breeding cycles while the body decomposed. The differences lay in the orientation of the body – both lay on their sides with the face to the north-west, but with the head at opposite ends – and in the nature of the finds assemblages. The adult male in T1 produced no artefacts other than the leather wrapping and fragments of vegetable fibres, but the burial in T2 had a necklace, beads sewn onto the leather wrapping, and a lip plug, all of which suggests a female burial. Both tombs pre-date the foggaras to which they are adjacent.

Osteological analysis
By Efthymia Nikita and Marta Lahr

The skeletal material of 47 individuals was recovered and examined. One of these individuals was recovered during surface collection from the Taqallit cemeteries, while the remaining 46 were excavated from 40 tombs from various cemeteries. As numerous tombs had been looted by tomb robbers, it was considered important to examine the state of preservation of each skeleton independently. Overall, 17 skeletons had signs of discoloration and 43 of them were extensively fragmented. Nevertheless, the average weathering level, following Buikstra and Ubelaker’s (1994) standards, was 1.4, while in 8 cases cartilage was preserved on some of the joint surfaces. Finally, on two skeletons tooth marks, possibly inflicted by carnivores, could be observed.

With the use of standard osteological methods, the sex and age of the individuals was determined. In total, 14 male and 20 female individuals were identified. The sex of the remaining 13 skeletons could not be determined, but it should be stressed that 10 of them were subadults, thus any sex estimation based on osteological criteria would be unreliable. The remaining three individuals were preserved very poorly and lacked any sex diagnostic feature. The age groups in which the individuals were divided, along with the number of individuals in each of these, are given in Figure 13.

In addition to the above, any signs of pathology in the sample under examination were recorded. The main pathology affecting the examined individuals was arthritis and was identified on 14 skeletons. It was principally expressed on the long bone epiphyses, the clavicles, the patellae, and the hand and

Figure 13. Age groups of the examined skeletons.
foot bones. In addition, vertebral osteophytosis was seen on 11 skeletons, being more pronounced on the lumbar and cervical vertebrae. Moreover, three individuals exhibited Schmorl’s nodes on their thoracic vertebrae. Antemortem tooth loss was widely distributed, given that it was seen in 13 dentitions, affecting mainly the posterior mandibular and maxillary teeth of both elderly but also younger people. Other dental diseases observed included caries (five cases), abscesses (one case) and periodontal disease (four cases). Fractures and exostoses were scored on two individuals and one case of possible trephination was also recorded. Three individuals demonstrated periostitis (abnormal bone formation) on the long bone diaphyses that might be associated to some inflicted trauma and subsequent infection. Three crania had cribra orbitalia and one porotic hyperostosis, both possible signs of anaemia. Finally, among the skeletons under study was one with congenitally malformed sacrum (spina bifida?) and one with asymmetrical clavicles.

Several measurements were obtained from the postcranial elements, where these were well preserved, in order to assess the growth rates and the musculoskeletal activity of the Garamantes. For the latter, moulds were additionally taken from the long bone diaphyses and the clavicles.

For the potential examination of the biological affinities of the Garamantes to other African groups, all sufficiently preserved crania were digitized according to a protocol formulated by Marta Lahr, while non-metric traits were scored for the same elements.

DMP pottery and other finds 2009
By Victoria Leitch and Franca Cole

Pottery (VL)
The pottery from the 2009 season was recorded from a number of sites under excavation at Taqallit as well as from surface grabs, totalling over 1,000 sherds (Table 3). Each site is discussed briefly below in terms of significant types, their provenance and possible dates. The date equivalents of the main periods recognised in our survey and excavation work are laid out in Table 4.

The cemeteries and settlements of Taqallit
The overall impression from the various areas excavated and surveyed in the 2009 season is that this area contained several cemeteries that broadly fit into the Proto-urban and Classic Garamantian period. There are definitely some vessels which suggest a Late Garamantian date, possibly into the fifth century or beyond, and many amphorae of the early Roman period. There is not much evidence for pottery earlier than this, though the handmade wares could be earlier, however, we do not yet have enough information to securely date them beyond a general attribution as ‘Garamantian’.

Pottery types CW, AM, FW and HM refer to coarsewares, amphorae, finewares and handmade wares from the Fazzan Project type series (Mattingly 2007).

TAG001 Cemetery: surface collection yielded a few flagons similar to type CW 240, which is mid to late Roman. On the surface near the central shaft area (B) an ARS rim of Hayes 61a was found, of early fourth- to fifth-century AD date.

TAG001.T233: an amphora sherd, possibly African, was found.

TAG001 area 3: a nearly whole flagon with one handle, a creamy fabric and a poor cream slip could be Roman (Fig. 14a) (SF562); the form is similar to a flagon found in TAG012.T3 (SF507) that nevertheless has a different fabric, being a more typical North African form of the third to fourth century. Also found was an incense burner (SF574) in context 1077, showing white paint and incised lines: it is noticeably cruder than the example found in TAG012.T3. Another (SF575) was found in context 1089, with half its cup and the base intact and demonstrates that the cup was made separately and pushed into the base. Similar finds are known from previous excavations of late Garamantian burials, though no examples were included in the FP type series, and a third- to
### Table 3. Final pottery counts (RBHS) from 2009 season.

<table>
<thead>
<tr>
<th>Site type</th>
<th>Amphorae</th>
<th>Coarseware</th>
<th>Fineware</th>
<th>Handmade</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAG001 Cemetery (Type 3)</td>
<td>80</td>
<td>85</td>
<td>7</td>
<td>131</td>
<td>303</td>
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<tr>
<td>TAG006 Cemetery (Types 1-2)</td>
<td>26</td>
<td>11</td>
<td>-</td>
<td>42</td>
<td>79</td>
</tr>
<tr>
<td>TAG008 Foggara group</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>TAG012 Cemetery (Type 7-8)</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td>57</td>
<td>72</td>
</tr>
<tr>
<td>TAG026 Cemetery (Type 3)</td>
<td>104</td>
<td>16</td>
<td>1</td>
<td>79</td>
<td>210</td>
</tr>
<tr>
<td>TAG027 Cemetery (Type 3)</td>
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<td>6</td>
<td>1</td>
<td>9</td>
<td>61</td>
</tr>
<tr>
<td>TAG038</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>70</td>
<td>70</td>
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<tr>
<td>TAG050 Cemetery (Type 4)</td>
<td>44</td>
<td>23</td>
<td>-</td>
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<td>153</td>
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<td>TAG051 and 021 Cemetery (Type 3)</td>
<td>18</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>TAG054 Cemetery (Type 1-2)</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>TAG058 Occupation (tent bases)</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>TAG061 Occupation (tent bases)</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>TAG067 Occupation (tent bases)</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>TAG069 Cemetery (Type 2/5?)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>TAG070 Occupation (tent bases)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>TAG072 Occupation (tent bases)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>TAG074 Occupation (tent bases)</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>TAG081 Settlement</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>TAG082 Settlement</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>TAG083 Settlement</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>TAG084 Settlement</td>
<td>8</td>
<td>3</td>
<td>-</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>TAG085 Settlement</td>
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<td>-</td>
<td>-</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>TAG087 Escarpment settlement</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>TAG088 Occupation (tent bases)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>TAG095 Cemetery (Type 2/3?)</td>
<td>7</td>
<td>2</td>
<td>-</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>TAG096 Cemetery (Type 2/5?)</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Totals</td>
<td>357</td>
<td>165</td>
<td>27</td>
<td>533</td>
<td>1082</td>
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Table 4. Approximate date ranges of chronological phases defined in FP/DMP work.

<table>
<thead>
<tr>
<th>Code</th>
<th>Period</th>
<th>Dates BP</th>
<th>Dates BC/AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPAST</td>
<td>Late Pastoral</td>
<td>5000–3000</td>
<td>3000–1000</td>
</tr>
<tr>
<td>PAST</td>
<td>Pastoral (undifferentiated)</td>
<td>7500–3000</td>
<td>5500–1000</td>
</tr>
<tr>
<td>EGAR</td>
<td>Early Garamantian</td>
<td>3000–2500</td>
<td>1000–500</td>
</tr>
<tr>
<td>PUGAR</td>
<td>Proto-urban Garamantian</td>
<td>2500–2000</td>
<td>500–1 BC</td>
</tr>
<tr>
<td>CGAR</td>
<td>Classic Garamantian</td>
<td>2000–1600</td>
<td>AD 1–400</td>
</tr>
<tr>
<td>LGAR</td>
<td>Late Garamantian</td>
<td>1600–1300</td>
<td>400–700</td>
</tr>
<tr>
<td>GAR</td>
<td>Garamantian (undifferentiated)</td>
<td>3000–1300</td>
<td>1000 BC – AD 700</td>
</tr>
<tr>
<td>POSTGAR</td>
<td>Post-Garamantian</td>
<td>1300–900</td>
<td>700–1100</td>
</tr>
<tr>
<td>EISLAM</td>
<td>Early Islamic</td>
<td>900–700</td>
<td>1100–1300</td>
</tr>
</tbody>
</table>

Table 4. Approximate date ranges of chronological phases defined in FP/DMP work.
fifth-century AD date is probable. Further small fragments of two incense burners were found in tomb 234 (SF591) and context 1070 (SF564).

TAG012 Cemetery: TAG012.T2. Small fragments of an incense burner, similar to other types found (SF511), displayed the usual incised lines for decoration. The TAG012 examples offer further support for the Late Garamantian date suggested for this type.

TAG012.T3: this tomb produced several intact ceramic vessels that can be dated. A mid Roman Tripolitanian amphora (SF510) of type AM 27, of small to medium volume (probably not more than 40 litres) is similar to ones found at Sanjat bin Huwaydi. A flagon in a North African red fabric (SF507) with a buff surface was also found in the tomb, very similar to flagon SF562. An exact parallel for this form has not yet been found, though it does resemble Bonifay type Commune 62 from Nabeul which is dated from the fourth to the sixth century (Bonifay 2004, 291–3). This flagon is also interesting for its ‘Z’ graffito at the top of the handle (Fig. 14b): this might imply that it was a transport flagon but its small size does not fit well with this suggestion unless it contained a particularly good quality wine. There was also a fineware dish (SF508) decorated on the outside with uneven feathery strokes and on the inside with small stamped circles with dots and crosses within them (Fig. 14d). It has a thin, dull self-slip, smooth on the inside and rougher on the outside. The fabric is red/maroon, fine and hard with occasional large limestone inclusions. The form and fabric most closely resemble Tripolitanian Red Slip Ware forms seen in Libya, especially B698 dated to the fourth to fifth century AD (Kenrick 1993, 391) Finally, a probably locally made incense burner (SF420) with incised decorations and three colours (yellow, blue, white) was found (Fig. 14c). This form is long-lived and had not previously been dated securely before the Islamic period (HM 336) so this find is significant in showing that it was definitely being made during the Late Garamantian period. It is similar to, but finer than, the other examples found at Taqallit this season. The ceramics from this tomb suggest an overall fourth- to fifth-century AD date.
TAG012.T12: intact vessels were found in this tomb and include a small squat amphora with a flat ring-base and a wavy line decoration around the shoulder (SF518). The fabric is a pale creamy colour. No parallels have been found but this could be an African product, with the decoration suggesting a late Roman or Byzantine date (Fig. 14e). The other intact vessel is similar to the mid Roman Tripolitanian amphora type AM 26–7 (SF519), but the long toe is not normally associated with this amphora type. Finally, a probable African coarseware flagon with a red fabric and rouletted decoration on the outer body was found (SF516). It is similar to CW type 243 of late Roman date. The estimated date range for this tomb is from the fourth–seventh century.

TAG026 Cemetery: surface finds produced a handmade rim of HM type 391, a large jar in Berber Red Ware with a flat-topped decorated rim and a round body. It can only be very generally dated to the Garamantian period at this stage. Many handmade fragments have the typical basket-weave impressed flat tops, which are clearly Garamantian and, though similar to Proto-urban phase material from Zinkekra, may have continued into the Classic period. An ARS fragment of a Hayes 3c was also found, dating from the early/mid second to third century AD. The amphorae fragments include a type AM 15 early Roman amphora and a type AM 16, also early, and a type AM 19 which is mid Roman. The majority of the sherds are of the early types however, and many of them are badly formed with uneven rims and are sometimes overfired. Coarse wares were also present and probably originated in central/southern Tunisia with their brick red fabrics and dark plum buff surfaces.

TAG027 Cemetery: several coarseware vessels appear to have Roman Tripolitanian or central Tunisian fabrics, with typical abundant quartz and limestone inclusions. Also found was a single rim sherd of Italian sigillata, from a dish with barbotine decoration, suggesting an early Roman date.

The amphora types found seem to be more early Roman in form with African, possibly Tripolitanian fabrics. One is a badly made type AM 15 rim, and there are also a couple of handle stubs that suggest a technique of adding the handle that is more commonly associated with handmade wares, which might suggest that they are early forms made in small production sites destined for regional rather than Mediterranean distribution. There is also a mid Roman type AM 19.

TAG038: the significant quantity of Garamantian pottery sherds in this area suggest either pottery production (though no pottery wasters were actually found) or settlement refuse. Surface finds revealed many handmade rims similar to type HM 337 and a deep jar with a handle similar to type HM 353. Further sampling of the surrounding soil was made in the hope of extracting material for an AMS date that might help to better pinpoint the dates for these Garamantian handmade wares.

TAG050 Cemetery: surface collection revealed mostly Tripolitanian amphorae. Some rims could be identified as Tripolitanian I types, probably early first to mid second century AD in date. There were also a number of handmade vessels with a flat basket-weave impressed decoration that have previously been dated as Classic Garamantian pottery of the first to fourth century AD. Handmade pots with red diagonal painted stripes were also evident and thought to be Classic Garamantian types according to the Old Jarma stratigraphy.

TAG050.T2: possible mid Roman amphora of type AM 19 from Tripolitania.

TAG051.021 Cemetery: the handmade pottery collected from the surface was similar to material from Zinkekra associated with Proto-urban and Classic Garamantian sites.

TAG054 Cemetery: surface collection included an unusual handmade sherd with rocker decoration on the outer surface and impressed diagonal stripes on the inner that may have served as a coarse
surface for grinding; this could be late Pastoral or Early Garamantian.

TAG054.T3: a wheel-thrown coarseware bowl, possibly of Tunisian origin, suggests a late second- to third-century AD date when compared to examples from Saniat Jibril.

TAG054.T5: thin-walled handmade vessels.

TAG054.T8: a handmade vessel, probably a deep jar, cannot be dated more accurately than as Garamantian in character.

TAG058: a couple of ARS body sherds were found on the surface, though these could not be more closely dated than the mid first to fifth century AD.

TAG061: a surface grab revealed several sherds from the same overfired amphora, probably African.

TAG067: an ARS body sherd was found on the surface, though it could not be more closely dated than the mid first to fifth century AD.

TAG069 Cemetery: basket-weave impressed handmade wares were found, typical Garamantian.

TAG69.T7: a coarseware rim from a large bowl looked very like examples from Sabratha (type 215) and type CW 108, dating to the early Roman period.

TAG070 Occupation: a tent or hut settlement by a foggara line (F200) yielded an amphora sherd that was ribbed and may be medieval to modern.

TAG072: surface finds produced one amphora sherd of possible Islamic date with a ribbed surface and creamy fabric.

TAG074: handmade vessels were found on the surface. Dating is not possible at this stage.

TAG081 Settlement: low spread of decayed mudbrick visible. Surface finds included one reduced fired Tripolitanian amphora sherd and a poorly made handmade jar rim similar to type HM 301.

TAG082 Settlement: two mounds of decayed mudbrick visible. Finds included a possible Tripolitanian amphora sherd, in a type similar to type AM 44, which is of uncertain date, though probably Roman, several fragments of handmade pottery, and a broken upper quern stone (SF538).

TAG083 Settlement: large settlement site with mudbrick wall lines visible. Finds included several amphora sherds that were probably produced in Roman North Africa, and a coarseware bowl rim in a fabric with abundant limestone inclusions typical of central/southern Tunisian products. Some ARS body sherds confirm a broadly Roman date for this site.

TAG084 Settlement: mudbrick mounds and pottery scatter. Surface finds included imported Roman amphora sherds in 8 different fabrics, two Roman coarseware sherds and a Roman North African (Tunisian) cookware or coarseware lid possibly from central Tunisia, and abundant handmade sherds. There was also the lower stone of a rotary quern (SF539).

TAG085 Settlement: amphorae sherds include examples that appear to be from Roman Tripolitania.

TAG087 Settlement: suggested as a possible Early Garamantian settlement, this site yielded several
handmade wares similar to types found in Zinkekra in a Proto-urban or Classic Garamantian context.

**TAG088**: a nice example of a handmade lid, used for cooking, was found, with a domed top, air holes and a knob handle. This example is thinner walled and better made than other examples from Garamantian contexts which suggests it is medieval or post-medieval, which is interesting for demonstrating the longevity of some forms (see type HM 359 for a Garamantian example). A handmade bowl may be of Classic Garamantian date and is similar to type HM 346 with a direct rim and a small foot (SF421) (Fig. 14f).

**TAG089**: a handmade sherd was found at this site.

**TAG095 Cemetery.T2**: an amphora rim of type AM 16 was found, possibly an early Roman Tripolitanian type.

**TAG096 Cemetery: TAG096.T4.** handmade wares and amphora sherds cannot be dated.

**TAG096.T5.** a possible Roman North African shallow cooking pan, form Hayes 181, was found, with a thin slip on the interior and a northern Tunisian fabric. Alternatively it could be a battered ARS Hayes 26 shallow dish. Both types are most prevalent in the second to third centuries AD.

**Other finds from the burials (FC)**

**Beads**
More than 1,500 beads were recovered from the burials this season, and for the first time strings of beads were found in situ around the bodies, permitting an accurate reconstruction of the composition of each necklace or belt, and the order and combination of beads used (Figs 11 and 15). More than 1,000 of the beads recovered were found as part of a strand. Bead materials were predominantly carnelian and amazonite stones, glass and ostrich eggshell, with notable exceptions including a single modified cowrie shell bead (SF528, TAG006.T2), a mixed strand including drilled coral spacer beads exhibiting extensive wear (SF598, TAG001.T244), and a polished garnet bicone (SF502, TAG012.T2).

At TAG001, in two cases, two strands of beads were found twisted together and placed around the waist or hips of the body (T237 and T244). Ostrich eggshell beads were used in combination with small stone beads (T244, SF597), with blue glass beads (T242, SF595) and alone (T237, SF577). T237 had two necklaces of carnelian and glass used in combination (Fig. 15a): one with large lozenge-shaped, bilaterally flattened carnelians with glass spacers (SF576), the other with pairs of carnelian spacers, interspersed with glass seed beads (SF575). A choker-length necklace of graduated carnelians (short bicones) had a trio of pale blue glass beads at the centre (Fig. 15b, TAG001.T244, SF593). All beads recovered on strings had been threaded with the same type of thread: a very fine plant-fibre, tightly Z-spun and loosely 5-S-plied.

**Other jewellery**
The most unusual piece of jewellery recovered this season was a lip-plug (labret) carved as a single piece from a haematite nodule (SF527), and found in situ at the mandible of the body in TAG006. T2 (Fig. 16; cf. Fig. 12). The lip-plug consisted of a large, external disc and a smaller, labial disc joined by a solid, bulbous stem. The two discs were polished smooth, while the stem retained a natural grainy surface.

**Glass**
A new class of glass object discovered this season were the two glass rhyta found at TAG012.T3 and T12. SF509 had a short, broadly flaring rim on a straight body, tapering to a narrow, flat base.
Figure 15. a) restrung Garamantian necklaces from TAG001.T237 (SF576 larger beads and SF575); b) restrung Garamantian necklace from TAG001.T244 (SF593).
The second rhyton, SF517 had a similar profile, again with a short, broadly flaring rim and straight body, but the body tapered this time to a thick pedestal foot (Fig. 17). Both vessels appear to have been blown into a mould and cut off from the mandrel at the rim. The pedestal foot on vessel SF517 was of much thicker glass than the main body and would have been applied to the vessel after removal from the mould.

Conservation work continued this season on the glass vessels recovered from UAT050.T5 during the 2008 season. In addition to the four complete vessels identified and reconstructed last season, a large number of broken glass sherds was also recovered from the tomb, some found loose in the fill and others compacted together in the bottom of the tomb. Work this season concentrated on removing these fragments from the matrix in which they had been excavated and sorting them into reconstructable vessels. Including the four vessels reconstructed last season, a final total of 17 vessels has now been identified as coming from this tomb. The vessels range widely in size and shape, and include a short-stemmed wine-glass; a deep goblet with applied, flaring base; six narrow-necked blown-glass vessels, modified with tongs into square and multi-sided vessels; two mould-formed deep, open bowls, one with cut-glass decoration; and two thick-walled platters, one with a ring-foot, the other a ring-base, one of which also had cut-glass decoration incised just below the rim. Viewed as a group, the glass vessels show little similarity of style or manufacture and appear to be single or paired vessels placed in the tomb. The associated pottery finds (ARS vessels of Hayes forms 3C, 4 and 6) from the tomb indicate a date in the first half of the second century AD for this assemblage (cf. Mattingly et al. 2008, 251).

Metal

As in previous seasons, metal was recovered only in very small quantities, with the majority of in situ metal finds coming from TAG012.T12. These included SF520, an iron torque bangle; SF521, a copper-alloy rivet-plate; and SF522, a pair of iron rivets found in association with the glass rhyton SF509. The iron bangle is very large, suggesting it was intended for a man, or to be worn on the ankle. Copper-alloy rivet-plates were common finds in both Old Jarma (GER001) and Saniat Jibril (GER002). They are thought to have been used for joining leather, but have to date only been found in areas of poor organic preservation, and no mineral-preserved traces have been observed in the metal corrosion crusts. The iron rivets themselves do not appear to have been associated with the rivet-plate found in this tomb.

Four copper-alloy finger-rings were found near the hand of the body in TAG001.T236. SF560 was rectangular in cross-section, with tapered and overlapping ends, while SF561 comprised three copper alloy rings, all similar and square in cross-section, with blunt ends abutting, but not meeting.
A single copper-alloy earring (SF569) was recovered from TAG001.T240. This was almost identical in structure to finger-ring SF560, and may have been used as such previously.

**Textiles**

Only small shreds of textile were recovered from the burials this year, with the most diagnostic piece found in TAG001.T239. This was a coarse, rope-like edge of loosely S-spun, 3-Z-plied cord, 9 mm in diameter, attached to the textile body by sewing through individual fibre bundles. The threads were blackened, though their original colour was probably green.

**Leather**

Leather was found on only a small number of burials this year, and was in general very poorly preserved. The body in TAG006.T1 was partly wrapped in a single strip of leather SF525, that stretched around the body and arm. The leather strip was predominantly a single piece showing no sign of sewing or colour, although a knot holding two pieces together was noted. Further fragments of fine leather from this tomb exhibited a gather, with a coarse thread run through perforations in the leather. This is thought to be the remains of a bag.

Further leather wrappings were found on the body in TAG006.T2. This was very fine leather, again very poorly preserved, but appeared to have been decorated with very small blue faience beads (SF529 and SF533). No threads or perforations were found in the preserved leather fragments, so it is not possible to tell how these may have been attached.

**Wood**

A deeply flaring wooden bowl (TAG001.T239. SF587) was the only wooden find recovered this season. Extremely fragmentary, the bowl was found *in situ* next to the body.

**Gourds**

A single gourd fragment (SF590) was recovered from this season from TAG001.T239. The fragment had a cut, finished edge, with a line of fine perforations running parallel to this edge. The gourd was found *in situ* next to the body, in association with strings of beads (SF583) arranged in a looped design. As the beads were still on strings, rather than attached to the gourd individually, it seems most likely that small strings of beads were attached to the gourd using the perforations beneath the rim.

**Conclusions**

Though much scientific analysis of the skeletons and finds excavated this year lies ahead, the range of material culture recovered from the burials enables some initial observations about the key questions that the project is investigating, on human migration, movement and contact across the Sahara. The cowrie shell and lip plug (labret) from the female burial in TAG006.T2 strongly suggest sub-Saharan affinities. Faience beads from the necklace and shroud decoration of the same burial are more typical of Garamantian links with Egypt and the northern Sahara. The full significance of these finds for the ethnic affiliations of the Garamantes will become clearer when these aceramic tombs can be dated from the AMS samples, but they are currently thought to belong to the late first millennium BC, probably Proto-urban Garamantian in date. In the somewhat later nucleated cairn cemetery of TAG001, of Classic and Late Garamantian date, the discovery of several necklaces and bead chains complete and *in situ*, which allowed the reconstruction in perfect sequence of the beads, provides a rare insight into Garamantian aesthetics. Some bead chains were worn around the hips, and the more recently documented Saharan practice of using bead chains for apotropaic purposes may suggest a particular significance in the case of the woman in TAG001.T237 buried with a neonate and who may have died in or soon after childbirth.

The preservation of organic materials in some of the burials gives a glimpse into the range of material culture beyond that normally found in survey and excavation of settlement sites – leather shrouds in the early cairn burials in TAG006, coloured textiles, a wooden bowl and a gourd vessel.
from burials in the Classic-Late Garamantian cemetery at TAG001. During the Classic Garamantian period access to imported Mediterranean goods seems to have been widespread; the picture suggested by abundant surface finds of Roman amphora sherds at cemetery sites is corroborated by the excavation of unrobbed tombs each with one or more intact amphorae, fine ware vessels, and Roman glass vessels. The quantification of ceramic and glass finds is beginning to suggest that Roman trade with Fazzan was not simply a matter of a few luxury goods, but involved considerable amounts of amphora-borne commodities, high quality glass vessels, ceramic tablewares, and even cooking wares.

Comparison of both robbed and intact burials suggests a clear pattern in the robbing of tombs, involving the deliberate targetting of the head and neck area to recover beads from necklaces. Beads were a prime Saharan currency for centuries, and there are some indications that the extensive robbing of Garamantian cemeteries occurred well after the Garamantian period — not least the robbers’ apparent lack of interest in imported ceramics and glasswares, or in looking for bead chains around the waist of skeletons, suggesting a lack of familiarity with the full extent of Garamantian burial practice. On the other hand, there are a number of indicators that the robbing is not in general of recent date — some of this activity occurred before build-up of significant colluvial debris around tombs on the scarps. Our working hypothesis is that much of the robbing was concentrated early in the Islamic age, beginning after AD 1000 in this part of Fazzan (Mattingly 2003, 362–64).

Stratigraphic investigation of the type 3a drum cairns associated with foggaras F200 and F201 shows that the foggaras are later than the drum cairns, which probably belong to the Early and Proto-urban Garamantian phases. But although this season’s excavations revise the stratigraphic relationship between these tombs and foggara spoil rings suggested in some earlier publications, the general dating of the foggaras to the Classic Garamantian period is confirmed by the spatial associations with settlement sites discovered during survey work (and it is not excluded that the foggaras originated earlier in the Proto-urban phase). Although expansion of modern agriculture in the Wadi al-Ajal threatens the area, the terminal zones of the foggaras systems in the Taqallit area currently lie to the south of the main area of modern agriculture, and here the interrelationship of the ends of the foggaras systems and ancient settlement can still be observed. Settlements of Classic Garamantian date, with local handmade pottery and imported Roman amphorae and sometimes fine wares, were found around the ends of the two foggaras systems whose full courses were explored on the ground. This largely confirms the suspected dating of the foggaras systems to the Garamantian period. Libyan inscriptions on rocks carved by shafts in the upstream sections of four foggaras, and in one case actually within an access shaft, are probably also of Garamantian date and may relate to foggaras ownership, construction or maintenance.

Acknowledgements

The work in the 2009 season involved 15 Libyans and 31 foreign nationals, participating on four sub-projects of the DMP. The bulk of the team was in the field from the 2 to the 25/28 January 2009, with the rock art survey group arriving and departing earlier (27 December 2008 until the 12 January 2009). We are most grateful to our colleagues in the Department of Antiquities in Tripoli, Sabha and Jarma for all their inputs that facilitated the work of the project and enabled us to achieve the results reported above. Special thanks are due to Dr Giuma Anag, President of the Department, who has given us his customary strong support to the programme as well as offering material assistance through his staff and facilities. The new Controller of Fazzan, Mohammed Mashai, has been constantly involved with the work in the field and gave every support required. Libyan personnel in the field were: Dr Mustapha Salam (al-Fatah University, Tripoli, Geologist); Dr Ahmed al-Hawat (Gar Yunis University, Benghazi); Muftah Ahmed (Leicester, excavation); Abdussalem Ibrahim Weheshi (Reading, remote sensing); Raof (al-Fatah, Tripoli); Saad Salah Abdul Aziz (DoA Jarma, excavation); Youssef Daou Ibrahim (DoA, Sabha, excavation); Issa Khalifa Issa (DoA, Sabha, excavation); Mohammed Abdulllah Mansour (DoA, Sabha, excavation); Jamal Mohammed Ahmed (DoA Jarma, excavation); Ishmael al-Khair (DoA Jarma, excavation); Sheikh Hamdan (DoA Jarma, excavation); Saad Ahmed Mohammed (DoA Jarma, excavation); Hamid Mabruk (DoA Jarma, excavation); Abdul Rahman (DoA Jarma, excavation). As always we benefited from the excellent cooking of Suleiman Mohammed and Mohammed Koraman. As the responsible person for foreign missions, Saad Salah Abdul Aziz desires special mention for his careful attention to the diverse and sometimes complicated needs of a large group,
which he always sorted out with his characteristic efficiency and good humour. Mustapha Turjman from the Tripoli office provided indispensable service in the processing of the visa applications.

Non-Libyan personnel were as follows: Hafed Abduli (Université de Sousse, excavation); Dr Simon Armitage (Royal Holloway College, scientific dating expert); Stephen Baker (ULAS, excavation); Dr Tertia Barnett (Edinburgh, rock art survey, genetics); Thomas Davies (Cambridge, survey, excavation, osteology); Dr Nick Drake (King’s College, London, palaeoclimate); Professor Robert Foley (Cambridge, human evolution); Jan Francke (King’s College London, GPR); Mireya González Rodriguez (ULAS, excavation); Maria Guagnin (Edinburgh, rock art survey); Matthew Hobson (Leicester, excavation); Dr Mark Hounslow (Lancaster, palaeomagnetism); Dr Marta Mirazón Lahr (Cambridge, survey director, osteology); Victoria Leitch (Oxford, pottery); Dr Lisa Maher (Cambridge, lithics); Professor David Mattingly (Leicester, Director, excavation and Taqallit cemetery survey); Farès Moussa (Edinburgh, excavation, and Taqallit cemetery survey and rock art survey); Efthymia Nikita (Cambridge, osteology); Dr Maria Mercedes Martinez Okumura (Cambridge, survey, excavation, osteology); Dr Adrian Parker (Oxford Brookes University, pollen and phytoliths); Anita Radini (ULAS, excavation, archaeobotany); Ian Reeds (Leicester, excavation); Graham Ritchie (Edinburgh rock art survey); Toby Savage (Leicester, photographer); Dr Djuke Veldhuis (Cambridge, survey, excavation, osteology); Dr Kevin White (Reading, remote sensing); Alex Wilshaw (Cambridge, survey, excavation, lithics, osteology); Professor Andrew Wilson (Oxford, excavation and foggara survey). In addition, Martin Sterry (Leicester) did some essential pre- and post-field GIS work for the project.

Funding for the project was provided by the Society for Libyan Studies from its annual grant from the British Academy (BASIS) research allocation under the Learned Societies Programme; from the British Academy (for the rock art work); from RPS; from Repsol (this latter covering costs of 10 days’ fieldwork by the geomorphological team in eastern Fazzan). In Leicester, Sharon North provided particularly crucial support during pre-field organization, with Jane Bloomfield and Danni Coffey fulfilling a similar role for the Cambridge group. As ever, we are particularly grateful to the members of the Society for Libyan Studies Fieldwork Committee and to the officers of the Society for Libyan Studies and its Honorary Treasurer, Philip Kenrick.

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