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E29G1 Revisited: the Current State of the Surface Archaeology of Western Regions of the Fayum North Shore, Egypt

Introduction

In their book on the Fayum North shore, Fred Wendorf and Romuald Schild reported on a site they designated E29G1, recording the presence of stone artefacts and fishbone and relating two radiocarbon determinations to the local lacustrine sediment stratigraphy. In 2009, we revisited the site and recorded the numbers and spatial distribution of material in two areas together with a survey to locate hearths and grinding stones. It was our intention to work in this area after the preliminary work was completed but political conditions have prevented our return. Since our visit, highway construction has modified areas of the desert surface in the vicinity of E29G1. While the Google Earth image accessed in November 2015 showed the site had escaped direct damage, a new highway is located only 1.5 km to the south west of E29G1 and a new track exists adjacent to the site that leads to an area of what appears to be industrial excavation to the northwest. The site is therefore potentially threatened and it is important that our observations, limited though they are, should be published. This report also provides a means to acknowledge the importance of the work Fred Wendorf and Romuald Schild undertook in the Fayum. The significance of the Fayum north shore to

our understanding of the prehistory of the eastern Sahara is due to the diligence of a small group of scholars, including Wendorf and Schild, who have built upon each other's work. The results reported in this study continue this tradition.

1. Background

Gertrude Caton-Thompson and Elinor Gardner worked in the Fayum in the 1920s concentrating on two stratified sites, Kom K and Kom W (Fig. 1), but noting the presence of extensive surface artefact deposits in surrounding areas. They produced an extensive body of published work (Caton-Thompson 1926a; 1926b; 1927; Caton-Thompson and Gardner 1929; 1934; Caton-Thompson *et al.* 1936; 1937), and their findings were incorporated into early studies accounting for the origins of the Neolithic (e.g. Braidwood 1960). These early publications were subsequently built upon through a series of later 20th century projects, notably by Fred Wendorf and Romuald Schild (1976) whose report we discuss in more detail below. Other notable studies include those by Bolesław Ginter, Janusz Kozłowski and colleagues (Ginter *et al.* 1980; Kozłowski and Ginter 1989; 1993), Robert Wenke (1984; Wenke, *et al.* 1983; Wenke and Casini 1989; Wenke, *et al.* 1988), Fekri Hassan (1986; Hassan, *et al.* 2006; 2012), and Douglas Brewer (1987; 1989a; 1989b). More recently Noriyuki Shirai (2010) has published a study focusing on the stone tools from the Fayum north shore.

In their 1976 book, Wendorf and Schild suggest that the site they labelled E29G1 is the equivalent of Caton-Thompson and Gardner's Site Z1 (Fig. 1). Site Z1 is mentioned briefly by Caton-Thompson and Gardner (1934: 59) and described as a location with large quantities of microliths. When Wendorf and Schild visited the area decades later, they reported on six artefact concentrations together with what they described as a scattered veneer of artefacts found along the eastern slopes of two deflated basins covering an area measuring approximately 700 x 120 m (Fig. 2). Within lacustrine sediments, which they describe as organogenic swamp sediments associated with *Pila ovata* snail shells, they describe a complex stratigraphy. Based on the observations they made from the trenches excavated this stratigraphy is used to propose links to a series of suggested lake advances and retreats. As we have discussed elsewhere (Phillipps *et al.* 2016), there is reason to be cautious about the suggested lake change sequence, since there are issues with the way that chronostratigraphic correlations were made in a series of studies that followed on from Wendorf and Schild's work. Rather than repeat the discussion of the issues surrounding chronostratigraphic correlations (see also Holdaway and Wendrich 2017), here we consider the artefact concentrations that Wendorf and Schild observed.

In one area of reworked lacustrine sediments at E29G1, Wendorf and Schild report the presence of a small number of stone artefacts together with a fragment of a human skull and a number of fish bones. In Areas A through E, more substantial archaeological deposits are reported. In Area A, fish bones and stone artefacts occur together with charcoal and a radiocarbon date that was obtained from this charcoal is re-reported here in Table 1 using the latest calibration curve. Bands of what are described as swamp sediments occur at higher elevations above Area A and the uppermost of these deposits also contains stone artefacts. Calibration was unavailable to Wendorf and Schild at the time they published. The radiocarbon determinations they obtained came from Teledyne Isotopes. Radiocarbon determinations published by this laboratory in the journal *Radiocarbon* indicate that determinations were calculated using the conventional Libby half-life (publications refer back to the method given in Walton *et al.* 1961). We have therefore calibrated the dates reported by Wendorf and Schild using the northern hemisphere terrestrial curve (*Pila ovata* is a freshwater shell).

Area E is described as a small concentration of artefacts eroding from the top of lacustrine sediments. An L shaped trench excavated in this area revealed three layers with cultural material including fishbone cemented in a breccia, relatively rare stone artefacts and burned *Pila ovata* shells. One of these shells was dated (Table 1).

Table 1. Radiocarbon determinations published by Wendorf and Schild (1976) calibrated against the IntCal13 (Reimer *et al.* 2013) curve using Oxcal 4.2 (Bronk Ramsey 2009)

	Lab No. (material)	**CRA BCE**	**Calibrated age BCE IntCal13**
Area A	I-4128 (charcoal)	6150 +/- 130	7064+/-202
Area E	I-4129(*Pila ovata* shell)	5190+/- 120	6019+/-127

Wendorf and Schild do not describe the stone artefacts they observed in detail nor did they publish descriptions of the faunal remains. Fish remains from E29G1 remain unpublished however Linseele *et al.* (2016) reviews the non-fish faunal material from E29G1 as well as from other Fayum sites that are described as Epipalaeolithic (E29H1, Site 2 and FS2). The E29G1 assemblage is dominated by Dorcas gazelle (*Gazella dorcas*) and Hartebeest (*Alcelaphus buselaphus*) although around half the elements were not identified. The two radiocarbon determinations obtained, once calibrated, indicate ages around 9000 BP and 8000 BP respectively however while both samples were obtained from deposits that included cultural materials, neither of the dates were obtained from secure cultural deposits like hearths. Thus, while they provide general age indications they may not date

the archaeological materials precisely. As discussed in detail elsewhere (Holdaway and Wendrich 2017; Phillipps *et al.* 2016), using isolated charcoal deposits to date both the lake advances and retreats, and concentrations of artefacts can be problematic. Based on the observations Wendorf and Schild made, the area that we have designated as Z1 referring to the site name employed by Caton-Thompson and Gardner indicates the presence of an archaeological record comparable to that found further to the east in the vicinity of Kom W and Kom K.

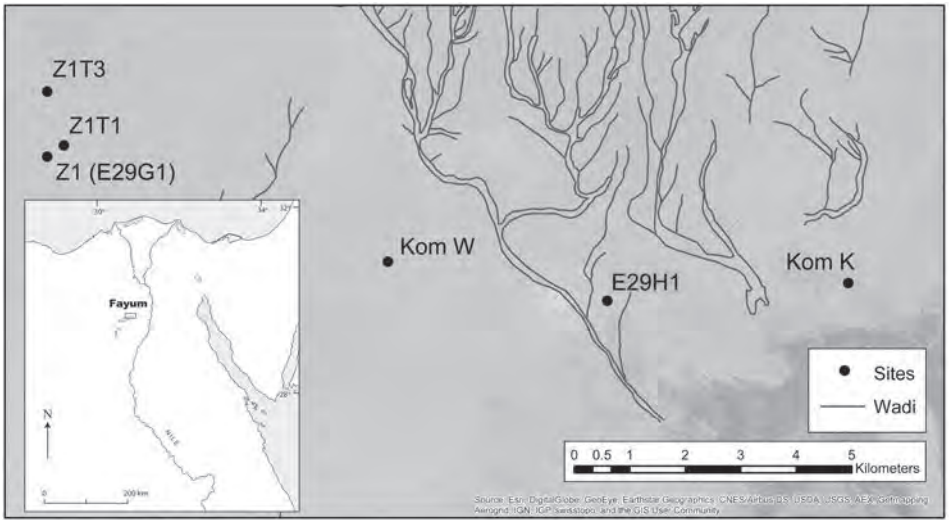

Fig. 1. The Fayum north shore showing the sites mentioned in the text

2. The 2009 Survey

As part of a wider survey of the prehistoric archaeology of the Fayum north shore (Holdaway *et al.* 2015; Holdaway and Wendrich 2017), the area around E29G1, designated Z1, was visited in 2009 and a series of observations made. Figure 2 shows the area covered in the 2009 survey measuring 2138 m^2 together with a georegistration of the map published in Wendorf and Schild (1976: Fig 97) that shows the features they recorded and the location of their excavation trenches. Also shown on the figure is the location of two transects, Z1T1 and Z1T3, which were used to record the locations and numbers of surface archaeological materials. These transects, laid out as a cross 100 m in a north south and east west direction with arms 10 m wide, were used as sampling units in our Fayum north shore study (Holdaway and Wendrich 2017). As in our wider study, the two transects

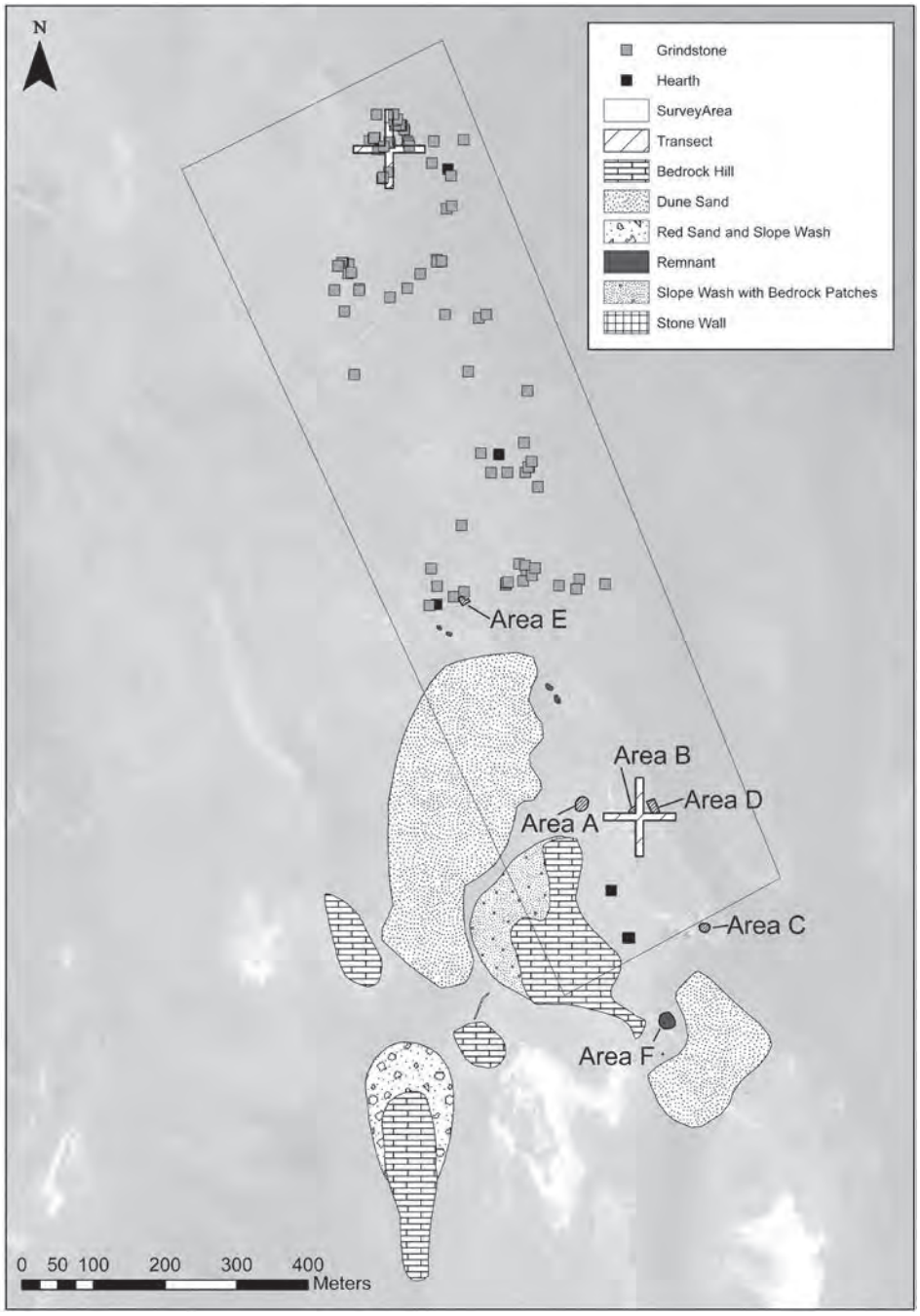

Fig. 2. Z1 (E29G1) with the georegistered map published by Wendorf and Schild (1976: fig. 97). The georegistration is approximate and is based on the topographic features that Wendorf and Schild identified

reported here were first surveyed to record different surface sediment types then surveyed to record the location of individual archaeological items with a maximum dimension > 20 mm (Fig. 3-4). We report the results of the survey of the two transects below making comparisons with the results of similar transects recorded further to the east along the Fayum north shore.

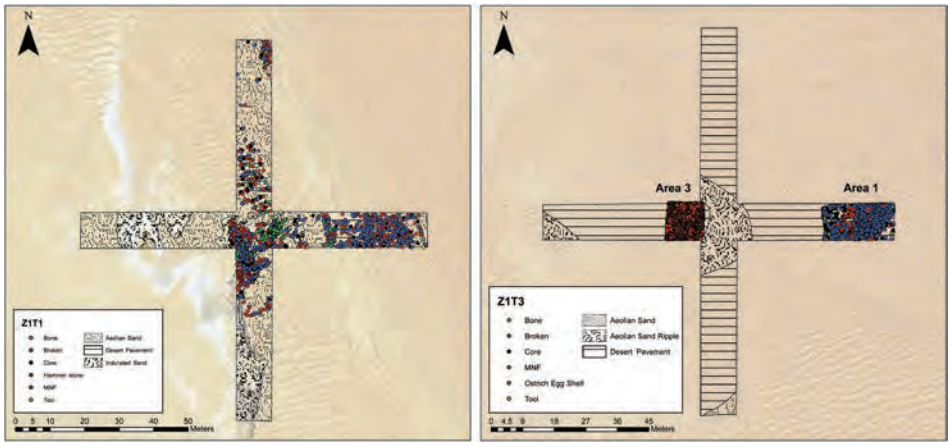

Fig. 3. Transects Z1T1 and Z1T3 recorded in 2009. Owing to the high density of artefacts encountered, only limited areas in each of the transects were recorded

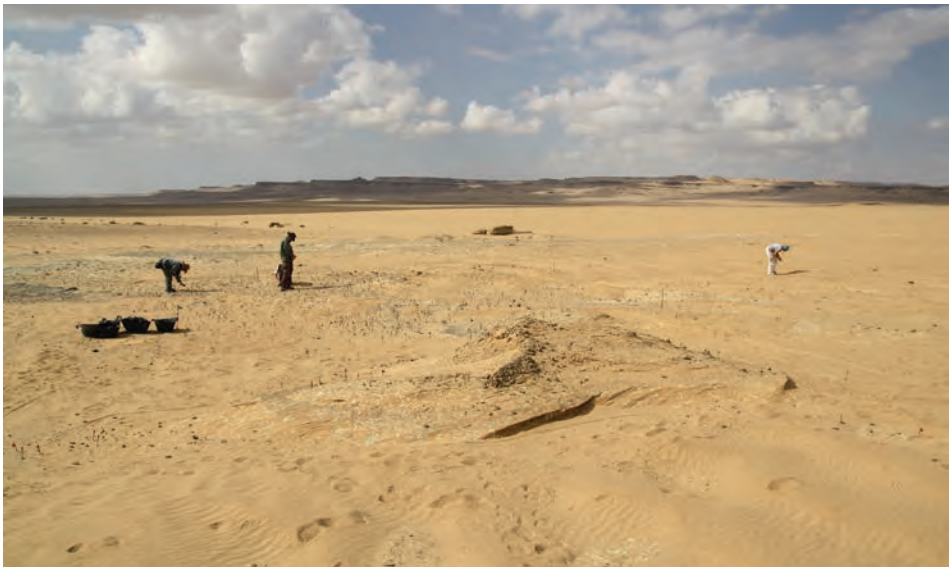

Fig. 4. Survey of Z1T1

The area between transects was surveyed to locate hearths and grinding stones following the same protocol adopted in other areas. Individuals, spaced 10 m apart, walked in a line marking hearths and grinding stones as they were encountered. Those at either end of the line used handheld GPS units to ensure that all areas were covered. A team followed behind to record the location and form of the marked items. Hearth and grinding stone descriptions followed those reported for the wider study (Holdaway and Wendrich 2017). For grinding stones the shape and lithology was recorded while for hearths the presence of heat retainers was noted, the degree to which these were clustered and the presence of charcoal was recorded.

3. Results

Both transects recorded, Z1T1 and Z1T3, were covered with dense concentrations of stone artefacts and smaller quantities of bone and other materials. Owing to the concentration of items, not all of the area covered by the transect arms were surveyed (Fig. 3). Table 2 provides counts of the number of artefacts and bones recorded with densities calculated relative to the actual area surveyed. Artefact density in Z1T3 was very high, meaning that only two relatively small areas were recorded. Stone artefacts were divided into broad technological classes: complete and proximal flakes, broken flakes, cores, and tools where flake blanks included retouch. The short duration of the time we spent within the area surrounding E29G1 meant that we did not complete a full technological analysis of the stone artefacts identified as we have reported for other areas (Phillipps and Holdaway 2016; Holdaway and Wendrich 2017). Nor were the bones observed identified to species as we have for deposits further to the east (Linseele *et al.* 2014; Linseele *et al.* 2016). We noted the presence of bifacial axes, comparable to those found by Caton-Thompson and Gardner (1934, plate IX and XXIII) at Kom W and Kom K, in the Z1T3 transect although none of these fell within the areas we intensively surveyed (Fig. 5). The analyses presented here are therefore necessarily preliminary but important since as noted above, sites in this region are under threat.

On the Z1T1 transect, areas of desert pavement (defined following the discussion in Holdaway and Wendrich 2017) tend to have better visibility than areas with aeolian and indurated sand. However, a comparison of the relative frequencies of artefacts found on the different surface types indicates that these are more frequent on surfaces with some aeolian sand cover. As proposed for areas studied further to the east in the Fayum, it is possible that sand cover serves to protect

Table 2. Object frequency and density (number/m²) together with surface type for the areas recorded in transects Z1T1 and Z1T3. For transect Z1T3 the only surface type was desert pavement. Surface type and artefact class definitions follow those used in Holdaway and Wendrich (2017)

	Z1T1				Z1T3			
	Aeolian sand		Desert pavement		Area 1		Area 2	
	Frequency	Density	Frequency	Density	Frequency	Density	Frequency	Density
Bone	123	0.94	12	0.07	3	0.01	1164	10.86
Broken	423	3.23	171	1.02	903	4.49	1148	10.71
Core	105	0.80	25	0.15	824	4.10		0.00
Hammer stone	1	0.01				0.00		0.00
Flake platforms	929	7.08	203	1.21	3236	16.09	3510	32.76
Ostrich eggshell					1	0.00		0.00
Tool	38	0.29	12	0.07	46	0.23	44	0.41
Total lithic	1404	10.71	411	2.45	5009	24.90	5866	54.75

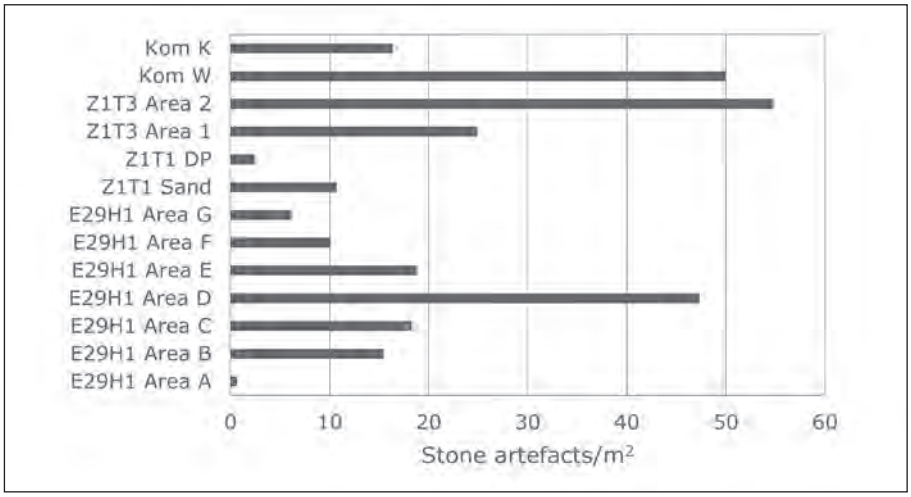

Fig. 5. Stone artefact density for the Z1 transects together with densities obtained for areas further east in the Fayum north shore. Densities are calculated as number of objects of all forms per square meter and are based on fieldwork reported in Holdaway and Wendrich (2017)

surface artefact deposits. In addition to the results from the Z1 transects, Figure 6 provides stone artefact densities for survey areas within the region of E29H1 recorded in a separate period of fieldwork in 2008. This site, also reported Wendorf and Schild (1976), was thought by them to be similar in composition to E29G1. There are now a number of radiocarbon determinations from hearths at E29H1 (Holdaway and Wendrich 2017) that show a temporal range that encompasses the two calibrated determinations Wendorf and Schild obtained from E29G1. Acknowledging the issues with using older radiocarbon dates from sedimentary charcoal deposits, the calibrated ages support Wendorf and Schild's (1976:194) suggestion that the two sites date to similar periods.

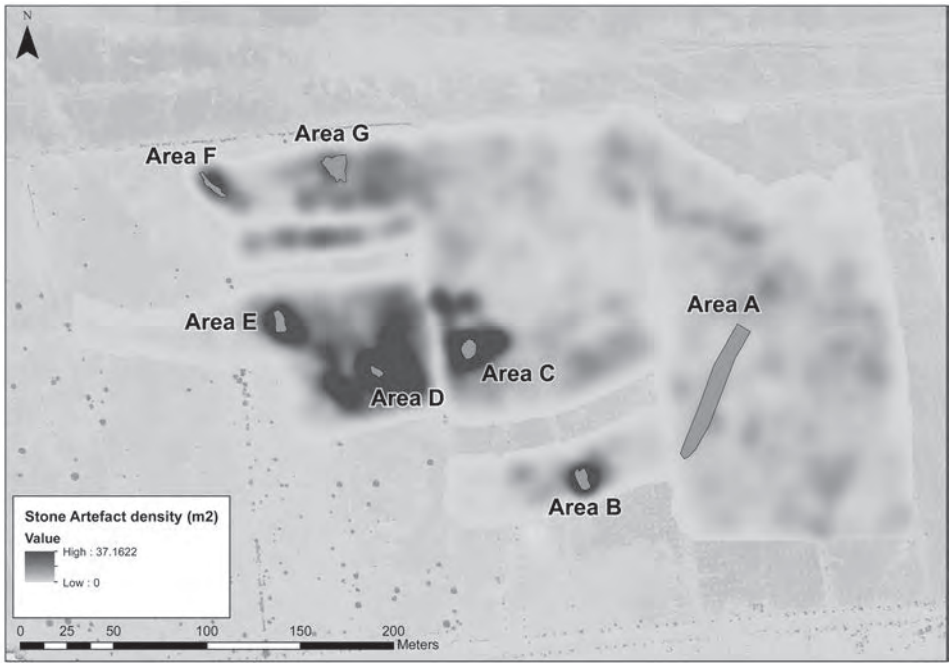

Fig. 6. E29H1 and the areas of analysed artefacts

For comparative purposes, Figure 5 also provides surface stone artefact densities for areas recorded at Kom K and Kom W. With a density of up to 54 artefacts per square meter (in Area 2 of Z1T3), parts of the Z1T3 transect have densities as high as those found on the surface of parts of Kom W and one of the areas (Area D) recorded at E29H1 (Fig. 6). Both of the areas recorded at Z1T3 have densities in excess of those recorded for the surface at Kom K (Holdaway and Wendrich 2017).

In contrast, the density of artefacts at Z1T1 is lower, varying from a high of around 10 artefacts per square meter on the area with aeolian sand to a low of 2.4 artefacts per square meter on the area with desert pavement. These densities are comparable with those found at E29H1 (except Area D) which also ranges considerably in values from lows less than one artefact per square meter to high values close to those found on Kom W. Based on density measures, the two Z1 transects differ in composition, a difference that is also expressed in the relative proportions of stone artefact types.

Figure 7 provides stone artefact proportions based on frequency counts for the basic artefact types noted above. Flakes with platforms (i.e. complete and proximal flakes) are the most frequent form in both transects and therefore account for the largest proportion of artefacts but the proportion of cores is higher in Z1T3 than it is in Z1T1. Figure 7 includes artefact proportions from E29H1 from the areas analysed using the same artefact categories recorded in the Z1 transects. E29H1 frequency measures per area are variable however a number have higher proportions of retouched tools than observed at the Z1 transects. Core proportions vary with some showing proportions as high as those recorded for Z1T3. Overall, the Z1 transects have higher proportions of broken flakes than found in the E29H1 analysed areas.

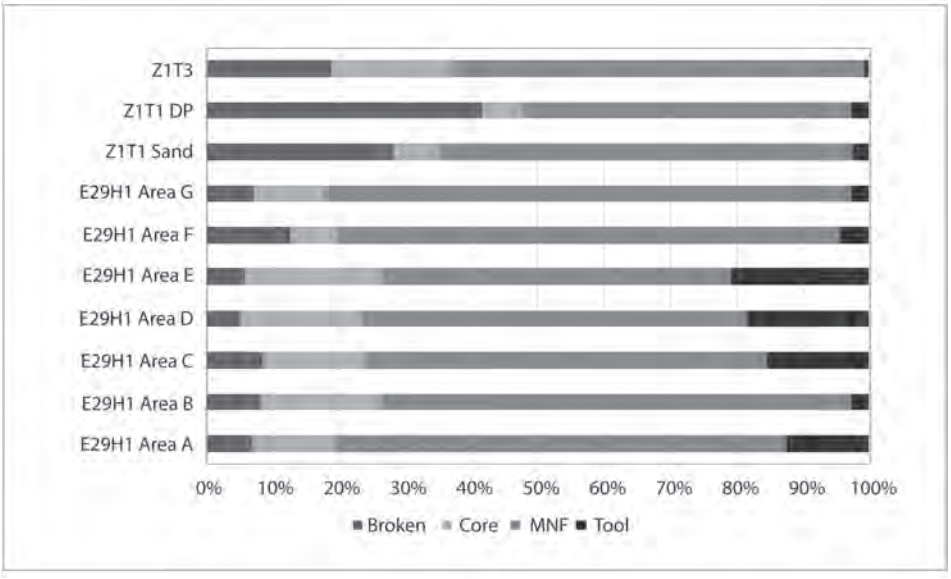

Fig. 7. Stone artefact proportions for the Z1 transects and Areas A through G at E29H1

Figure 8 shows the flake to core ratios for the two Z1 transects and those from E29H1. The ratio for the two surface types at Z1T1 are high, comparable to the ratio from Areas F and G at E29H1. In contrast, the ratio value for Z1T3 is lower, comparable in value to Areas A through E from E29H1.

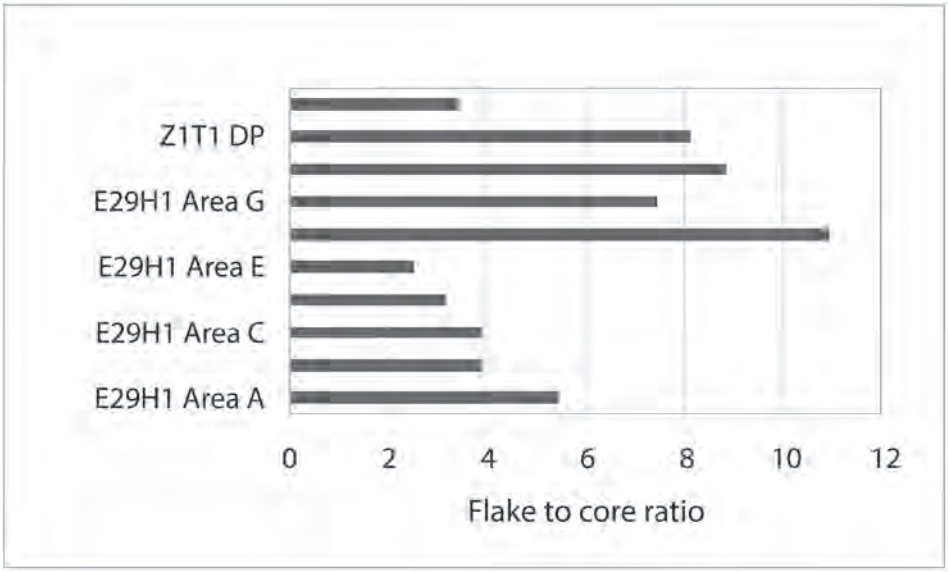

Fig. 8. Flake to core ratio for the areas recorded at the Z1 transects together with Areas A-G at E29H1. The ratio is calculated by dividing the number of complete and proximal flakes by the number of cores. The two areas recorded at Z1T3 are combined

The area between the two Z1 transects was surveyed for hearths and grinding stones as discussed above. As a result of this survey, 68 grinding stones were identified together with five hearths. The area covered was more than 2000 m^2, giving a grinding stone density of 0.032 per square meter and a hearth density of 0.0023 per square meter. These are higher values compared to the densities of grinding stone and hearths recorded further to the east in the vicinity of E29H1 where grinding stones have a density of 0.000173 per square meter and hearths a density of 0.00066 per square meter.

Table 3 provides frequencies of the upper and lower grinding stones identified in the Z1 survey area together with their shape and lithology. Sandstone is the most common material whereas further to the east, in the vicinity of E29H1, limestone grinding stones are more common. The five hearths identified have scattered heat retainers and showed no evidence for the presence of charcoal.

Table 3. Grinding stones recorded in the Z1 survey area

Hand stone			Lower grinding stone		
Lithology	**Shape**	**Frequency**	**Lithology**	**Shape**	**Frequency**
Conglomerate	Concave	2	Basalt	Flat	1
	Triangular	1	Conglomerate	Block	2
	Flat	1		Concave	8
Limestone	Flat	3		Flat	1
Quartzite	Flat	1	Limestone	Concave	5
Sandstone	Concave	10	Sandstone	Block	3
	Flat	6		Concave	19
	Triangular	1		Flat	4

4. Discussion

The description that Wendorf and Schild (1976) supplied for E29G1 indicated the potential the site provided for understanding occupation of the Fayum north shore in areas west of E29H1. Our more recent survey confirms their observations and provides more data on the abundance of archaeological material in surface deposits. Frustratingly, our time in the area was limited, reflected in the extent of the observations we have reported here. Our understanding of the Z1 area is therefore largely based upon limited observations used to make comparisons with areas further east along the Fayum north shore where we have conducted more extensive research.

Our research focussed on two sections of the Z1 area with the southern transect providing a sample of material from the area Wendorf and Schild identified as E29G1. We can be confident of this based on matching the topographic features that Wendorf and Schild included in their location map (1976: Figure 97) which we used to georegister their map in relation to ours (Fig. 2). We also retrieved a trowel from the trench illustrated in Wendorf and Schild (1976: 103) which was likely left after their work was completed (as a material record of archaeological work in the Fayum we left the trowel in place; Fig. 9).

At the time of our visit, the region around E29G1 was covered with stone artefacts and bones (largely fish) found on the surface but with remnants in stratified

Fig. 9. Image of the trowel found at E29G1 during survey in 2009. The trowel is in the lower left hand side of the image

deposits. Our work concentrated on the surface deposits in one transect, Z1T1, in which we recorded a large number of stone artefacts.

Stone artefact density at Z1T1 is comparable to some of the areas recorded further to the east at E29H1 but the density in the area of E29G1 we recorded is relatively low. The artefacts are more fragmented compared to the areas further to the east and have relatively low proportions of retouched tools. The flake to core ratio values for both desert pavement and sand surfaces recorded at Z1T1 are high, toward the upper end of the values recorded at E29H1. More detailed recording at E29H1 indicated that flakes were likely transported away from this site for use elsewhere (Phillipps and Holdaway 2016). One of the consequences of this is relatively reduced values for the flake to core ratio. Although we did not measure the required variables to detect flake movement at Z1T1 directly, and so cannot demonstrate the movement or otherwise of the products of lithic reduction, the flake to core ratio at Z1T1 is at the upper end of the range of values found at E29H1. This might indicate a different form of lithic economy operated in the western edge of the Fayum north shore compared to areas further to the east. This might also be connected to the relatively low density of stone artefacts found at Z1T1 compared to E29H1 together with the small number of tools. However, these results need to be read as interesting observations rather than firm conclusions at this stage until the area can be investigated more fully by further fieldwork.

The high density of stone artefacts at Z1T3 contrasts with the lower densities at Z1T1. The former are in fact some of the highest densities we have recorded in the Fayum north shore, and as noted above, are only approached by the deflated surface deposits in some parts of Kom W. The composition of the Z1T3 lithic assemblage is different to that found at Z1T1 further to the south. It has a very large number of cores reflected in the low value of the flake to core ratio, which is lower than the majority of the areas studied at E29H1. The assemblage is dominated by flakes and cores with the retouched tool proportion barely registering in the relative artefact proportions shown in Figure 7. This is similar to the low proportions of tools found in the Kom K and Kom W assemblages, and there are some typological similarities between these locations (Phillipps 2012).

In some ways the potential of this assemblage is even more interesting than that observed at Z1T1. As described elsewhere (Phillipps and Holdaway 2016), further to the east there are a number of assemblages (e.g. Kom W) for which analysis indicates the loss of cores. That is, in contrast to the E29H1 assemblages, there is evidence to suggest that cores rather than flakes were removed leaving behind flake dominated assemblages. It is tempting to suggest that some of the

cores that were initially worked in the eastern parts of the Fayum north shore were transported west and deposited in areas sampled in the Z1T3 transect. Of course moving cores into an area would decrease the flake to core ratio by augmenting the number of cores relative to the number of flakes. Unfortunately we need more data than were recorded in 2009 to be sure of this conclusion so like the results from the comparisons between E29G1 and E29H1, this observation should only be taken as the impetus for more work.

A final set of observations relate to the grinding stones found when we systematically surveyed an area between the Z1T1 and Z1T3 transects. In this area, grinding stones are common and they occur at densities higher than those found further to the east. Grinding stones are of course susceptible to movement by people well after their use and abandonment and it might be that this difference simply reflects removal of grinding stones from areas further to the east. However, any activity of this type was not very systematic since grinding stones are found across the Fayum north shore. Thus, they do not seem to have been uniformly attractive to later visitors to the area. In addition, as detailed in Holdaway and Wendrich (2017), despite a long prehistory of activity around the Fayum north shore, the surface archaeological record has remained surprisingly intact right up that is until recent times. Thus, the relatively large number of grinding stones can be added to the list of interesting observations that make the Z1 area an important location for future research.

One of the conclusions of our more in-depth study conducted in areas to the east of Z1 was the need to understand the Fayum record at a landscape scale (Holdaway and Wendrich 2017). No one location, not even the famous stratified sites of Kom K and Kom W, can provide sufficient information to allow for inferences about the settlement system and socio-economy of the prehistoric occupants of the Fayum. Instead, multiple records of different types spread across the Fayum north shore need to be assessed in combination. The results obtained from the Z1 area provide indications that may bolster this argument further. There are hints that the Z1T3 assemblage may include cores that were moved from areas further east. It is even possible that the high flake to core ratio at Z1T1 reflects flakes that were added to the assemblage transported from the places further to the east that show a net flake loss. Unfortunately, without further data recording, these observations must remain speculative.

This brings us to a final point. The need to publish these preliminary findings is driven not by the completeness of the scientific analysis we can present but by the imminent potential destruction of the archaeological record the study of which

is needed to allow us to make the observations that are conclusive rather than speculative. Development is of course necessary, however before such land altering development goes ahead observation of the archaeological record needs to be made. The difficulty for archaeological records like those in the Fayum is that the types of observations that are needed require what appear to be largely redundant, repeated measurements of less than spectacular archaeological remains. Of course these measures are not in realty redundant nor is the spectacular nature of the record a criterion for assessing its archaeological significance. To understand how people used the landscape in the early to mid-Holocene in Egypt we need to make repeated observations over very large areas of things like flaked stone artefacts, fragmented pottery and animal bones. We need to study these items even if their information content appears to be low. It is things like the flakes and cores that tell us about movement and therefore landscape use. These items with low aesthetic appeal are nevertheless the basic material that when analysed fully will provide insight into a foundational period in Egypt's prehistory. To put it bluntly, if we are to understand the foundation of Egypt's Pharaonic civilisation we need access to intact desert surfaces before they are destroyed by development. And we need the time to study these surfaces and the archaeological record they hold. The 'once over lightly' approach as reported here is likely to raise more questions than it solves therefore we need to pressure authorities to allow meaningful heritage mitigation to be undertaken before development occurs.

Conclusion

Archaeological research in the Z1 area that includes E29G1 shows that surface scatters of archaeological materials, particularly stone artefacts, differ in density and composition from areas further to the east. Although observations are preliminary and more work needs to be undertaken, there is the possibility that flakes and cores that were removed from sites in the eastern regions of the Fayum North Shore were moved to locations further to the west. If so, this has implications for the extent and nature of the settlement system that occurred during time periods that cover the early to mid-Holocene. It might suggest that movement during times when people were occupying areas surrounding Lake Qarun was largely concentrated within the vicinity of the lake. Different aspects of lithic economy are suggested by the two transects studied at Z1. In Z1T1, high flake to core ratios suggest an excess of flakes. If this site is of an equivalent age to E29H1 then it might be that some of the flakes removed from this location were deposited

further west. In contrast, at Z1T3 the flake to core ratio is low suggesting a large number of cores. In the eastern areas of the Fayum north shore sites dated to the mid-Holocene indicate the removal of cores. If these were deposited at locations further west, this might explain the high number of cores (and therefore low flake to core ratio) at Z1T3. Unfortunately, these assessments remain speculative at present since we lack sufficient data to draw conclusive inferences. More work is needed before the critical surface deposits are destroyed through development.

Acknowledgements

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