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ATMAR AND BERNOL FARMS: NEW ACHEULEAN SITES IN THE LOWER SUNDAYS RIVER VALLEY, EASTERN CAPE PROVINCE, SOUTH AFRICA

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ABSTRACT

In this paper, we document two new Acheulean sites located in alluvial terraces bordering the lower Sundays River, Eastern Cape Province, South Africa. These terraces have been the subject of geomorphological studies in the past, and most recently they have been dated using the cosmogenic nuclide burial method (Erlanger et al. *2012; Granger* et al. *2013). Here, we provide new data that help improve our understanding of the Eastern Cape Earlier Stone Age (ESA) sequence by providing a basic assessment of site context, artefact typology and technology at two dated Acheulean locations: Atmar (0.65 ± 0.12 Ma) and Bernol (1.14 ± 0.20 Ma) Farms. Until now, we have relied on two sites to interpret this region's early archaeology, Amanzi Springs and Geelhoutboom, the former being the only site to ever be excavated. This research thus provides the first well-dated ESA sites for this region, confirming the presence of Acheulean artefacts within these terraces, originally described by Ruddock (1957). Key trends in artefact production include: simple core reduction strategies on primarily cobble blanks; low levels of reduction on all cores and formal tools; retouched tools occur primarily on flake blanks with little emphasis on careful edge modification; large cutting tools (LCTs) are variable in size and shape, flake blanks are favoured and shaped through bifacial reduction across large portions of the tools, yet cortex is retained on most, which overall indicates that shaping is limited.*

Key words: Earlier Stone Age, Acheulean, Sundays River Valley, alluvial terraces, Atmar Farm, Bernol Farm.

INTRODUCTION

The Earlier Stone Age (ESA) record of the Eastern Cape Province is extremely limited. Until recently, our understanding of the archaeology of this region has been based on only two named sites, Amanzi Springs and Geelhoutboom, and of these only the former has been excavated and described, although it remains to be accurately dated (Laidler 1947; Deacon 1970). When the regional archaeological sequence is reviewed, there is a notable absence of ESA sites (see reviews by Sampson 1974; Klein 2000; Mitchell 2002; Phillipson 2005; Herries 2011; Lombard *et al.* 2012), and where artefacts have been reported, these are primarily from poor context, surface scatters. Thus, well-dated ESA sites have been completely absent. Although Amanzi Springs provides important data that help characterise this region's ESA archaeology, the significance of this site is limited by the difficulties in dating it.

Recently, a new research programme has been established in the lower Sundays River Valley, the focus of which is to investigate a series of alluvial terraces that border the present-day river (Fig. 1; Lotter 2016; Lotter & Kuman 2018). These terraces have been the subject of a range of studies that have explored terrace formation, development and composition (Ruddock 1948, 1957, 1968; Partridge & Maud 1987; Hattingh 1994, 1996, 2008; Hattingh & Goedhart 1997; Dollar 1998; Hattingh & Rust 1999; Erlanger 2010; Erlanger *et al.* 2012). From this work, we now know that 13 terraces occur. The upper older terraces (1–9) can be clearly distinguished from the lower younger terraces (10–13); the former are primarily composed of quartzite gravel deposits, whereas the latter are primarily fine silt and sand (Hattingh 1994, 1996, 2008).

Ruddock (1957) was the first to report Stone Age artefacts in these terraces, but since this initial research, there has been no attempt to investigate these further. This early research relied on surface collections from exposed terraces, the bottom of gravel pits and the sides of road cuttings, and no record was kept of artefacts from *in situ* locations. According to Ruddock, a range of 'Stone Ages' occurred, including ESA (primarily Acheulean), Middle Stone Age (MSA) and Later Stone Age (LSA), but based on the lack of stratigraphic control during sampling, there was little said regarding the relative antiquity of the artefacts. However, based on the general appearance and form of most of the Acheulean pieces, Clarence van Riet Lowe suggested that they could be synonymous with Early and Middle Acheulean sites in the Vaal River basin (Ruddock 1957).

A recent study by Erlanger *et al.* (2012) provides a series of cosmogenic nuclide burial dates on clasts obtained from the gravels, and it was during this work that ESA artefacts were found *in situ*. Specifically, this occurred at three key sites: Atmar Farm (0.65 ± 0.12 Ma), Bernol Farm (1.14 ± 0.20 Ma), and Penhill Farm (<1.37 ± 0.16 Ma; Fig. 1; Granger *et al.* 2013; Lotter 2016; Lotter & Kuman 2018). Their study was thus the first to confirm the presence of *in situ* artefacts in the terraces, providing some stratigraphic evidence for surface finds reported by Ruddock (1957).

Accordingly, the aim of this research is to improve our understanding of the Eastern Cape ESA sequence and provide some preliminary results from excavation and survey work conducted at Atmar and Bernol Farms (Penhill Farm is the subject of a separate paper [Lotter & Kuman 2018]). Here, we discuss site contexts and assemblage integrity, along with some basic information on artefact form and production. This research allows us to expand our current understanding of the local ESA – specifically the Acheulean Tradition.

STUDY SITES AND METHODS

ATMAR FARM

Atmar Farm is a citrus-producing establishment just outside Kirkwood. The site occurs along the edge of a working canal where diggings have exposed gravel and fine alluvium from Terrace 10 (Figs 2 & 3).

The Atmar Farm stratigraphic sequence is simple (Fig. 3b). The uppermost deposit (*c.* 1–2 m thick in the area) is dominated

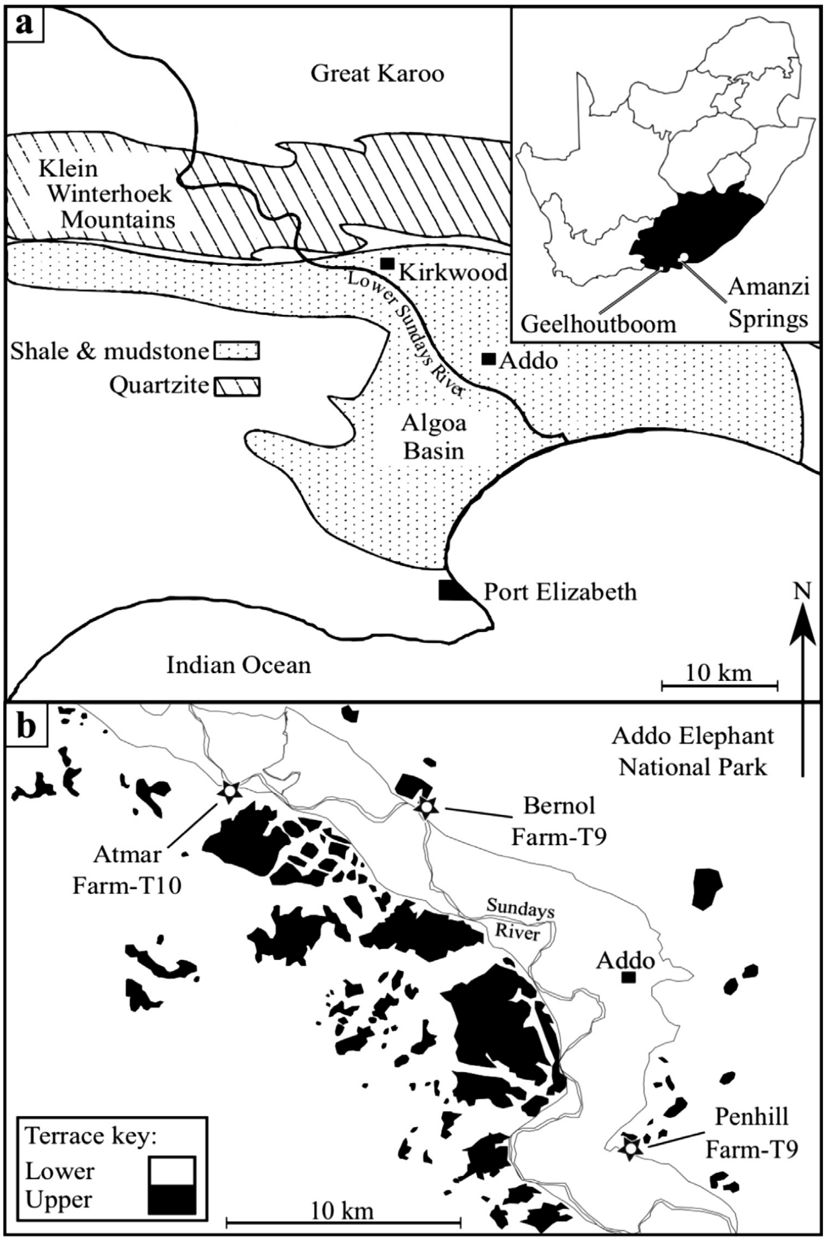

FIG. 1. *Location of the study area* (**a**) *modified after Hattingh & Rust (1999); and* (**b**) *terrace exposures with site locations and terrace (T) numbers modified after Erlanger (2010).*

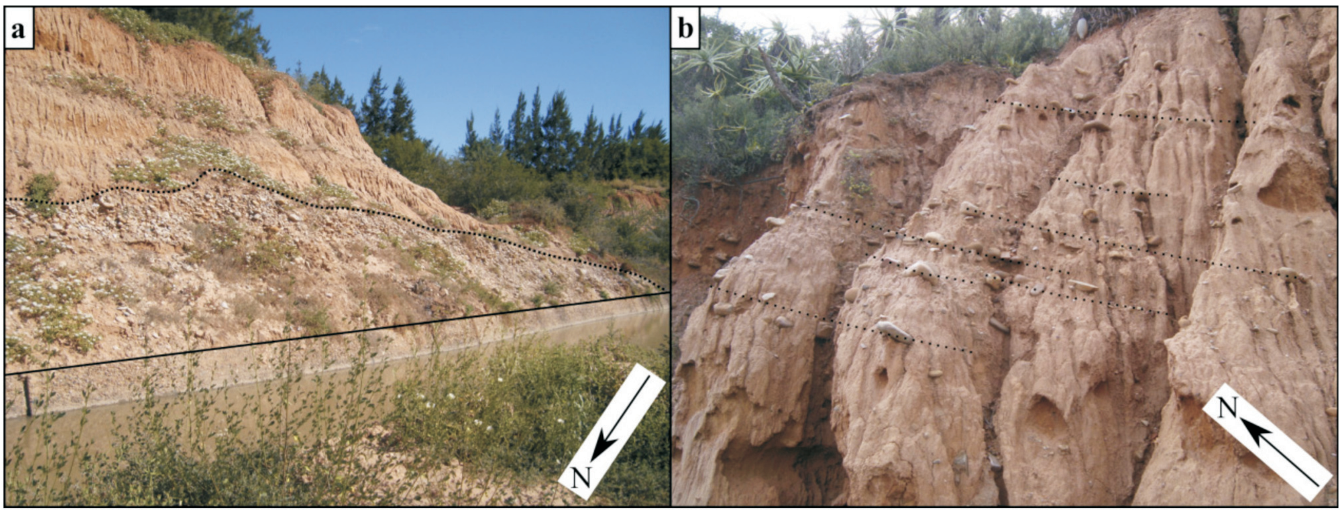

FIG. 2. *Atmar Farm terrace 10 exposure with canal in foreground (beneath solid line); fine alluvium occurs above the stippled line and discontinuous gravels occur beneath* (**a**). *Bernol Farm terrace 9 exposure at the dated location showing fine alluvium with gravel stringers* (stippled lines; **b**).

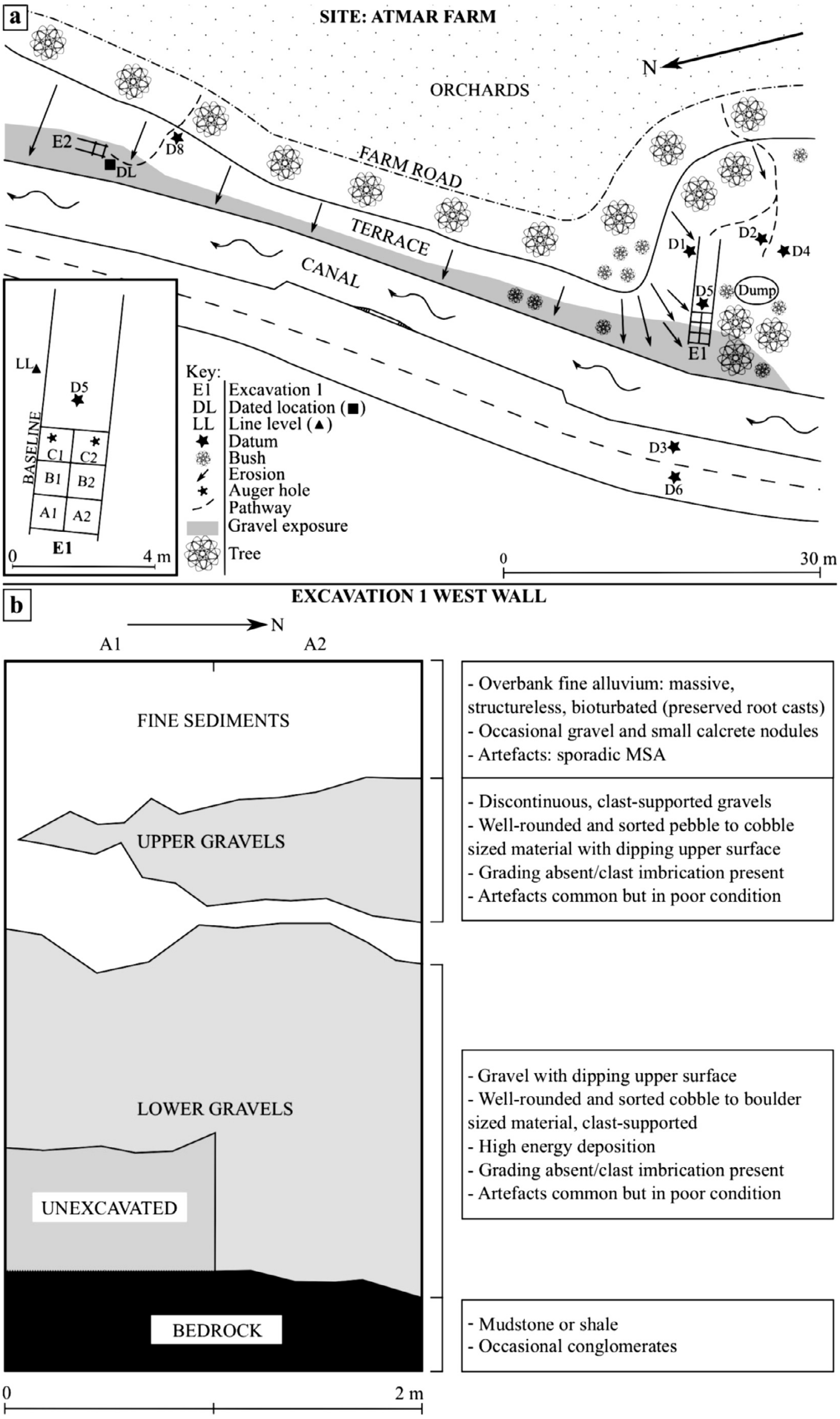

FIG. 3. *Atmar Farm:* (**a**) *plan view; and* (**b**) *stratigraphic sequence from Excavation 1 (scale applicable to both axes).*

by lightly coloured fine sediments consisting of overbank sands and silts, preserving sporadic Stone Age artefacts in fresh condition. Some of these appear MSA-like, especially in the upper fines, but they are most likely derived from surface wash. This capping of fine sediment varies in thickness across the entire site, and in some places, extensive surface erosion has led to the formation of rills and gullies (dongas). Overall, these overbank fines are massive, structureless and bioturbated.

Unconformably underlying these fines are discontinuous clast-supported gravels that vary in thickness (<1 m to approximately 2 m). These contain the ESA lithics and a range of pebble, cobble and boulder-sized clasts, most of which are imbricated and well-rounded; the interstitial matrix is composed of sand, and calcrete is largely absent. The upper surface of these gravels has a distinct dip. Figure 3b illustrates that in Excavation 1 both an upper and a lower bed of gravels occurs, each of which varies in thickness and composition, underlain by a clay-like bedrock derived from mudstone or shale, with sandstones occurring locally. Based on work conducted by Granger *et al.* (2013), this west-facing terrace exposure has been dated to 0.65 ± 0.12 Ma using the cosmogenic burial dating method. This age, obtained through the sampling of clasts from the gravels, dates when the overbank fines were deposited.

A 3 × 2 m stepped trench (Excavation 1; Fig. 3a), set roughly perpendicular to the canal, was established to excavate the Terrace 10 gravels. Work proceeded in spits of 10 cm within the fine overbank alluvium, and these were thickened to 20 cm due to the large size of the clasts once we reached the gravels. Sieving with both 2 and 4 mm mesh was used. A smaller test pit excavation (Excavation 2, Fig. 3a) was opened to assess artefact frequency at the dated location, a short distance away from the main excavation but within the same continuous gravel exposure; this was also dug in 20 cm spits. Once a sufficient sample of material had been obtained, for comparison with Excavation 1, this test pit was closed.

BERNOL FARM

Bernol Farm preserves a southwest-facing exposure of Terrace 9, found above an abandoned sand-filled canal that runs parallel to the Sundays River (Fig. 4). This site is characterised by a complex exposure of bedded overbank silts and sands and gravels sitting atop sandstone bedrock, across several hundred metres. At the dated location (at left in Fig. 4a), the fine sediments are greater than three metres in thickness, and imbricated gravels, as well as calcrete and silcrete, occur sporadically in the upper portion of the exposure as thin, discontinuous matrix-supported gravel stringers (10–15 cm thick; Figs 2 & 4b). Outsized clasts have been sourced from a higher terrace nearby (Granger *et al.* 2013). Towards the base of this exposure a larger discontinuous graded gravel deposit (1–1.5 m thick, clast-supported) occurs, within which ESA artefacts and bone are preserved, along with additional gravel material (all imbricated and rounded to sub-angular in shape). Sporadic bone and artefacts here and in the overlying thin stringers represent deposition on the floodplain with minor reworking and sorting by river flow (Granger *et al.* 2013); the bone is only partially mineralised. The date for this terrace exposure is provided by Granger *et al.* (2013) and is 1.14 ± 0.20 Ma. This was obtained through clast sampling from the gravels and thus dates the deposition of the overbank fines.

Additional areas (survey sites 1–4, Fig. 4a) along the same terrace contain deposits with preserved shell, bone, gravels and ESA artefacts. Within these areas, artefacts are abundant and there appears to be a mix of both ESA and MSA technology, with the latter most likely derived from the surface. However, it is unclear how exactly these exposures relate to the dated location and whether they are alluvial and/or colluvial in origin.

Sampling the Terrace 9 exposure at Bernol Farm has been extremely challenging. At the dated location the massive overburden makes excavating the artefact-bearing stringers and gravels near impossible, and as a result the bulk of our work here is preliminary. A test pit excavation was opened up at survey site 2 (Fig. 4a), the goal of which was to sample the exposed artefact, bone and shell-rich horizon along the edge of the survey site. Excavations here proceeded in 10 cm spits, until reaching a grey horizon, and thereafter 5 cm spits were utilised. Sieving was conducted using both 2 mm and 4 mm mesh. Within the grey horizon, at 1.3 m, Iron Age pottery was recovered. No Stone Age artefacts were found so we discontinued the excavation at approximately 1.5 m.

RESULTS

ATMAR FARM

Excavations at Atmar Farm have provided a small, poorly preserved, lithic assemblage of 345 pieces, coupled with a general absence of all non-lithic material. An assessment of artefact size distribution shows that a wide range occurs within the gravels, but there is very little small flaking debris (SFD; <20 mm) retained (n = 45; 13%; Fig. 5). The majority of all material is between 20–80 mm in size (n = 238; 69%). Almost all of these artefacts are produced on quartzite, comprising 97.7% (n = 293) of the entire sample, and finer-grained types are favoured (those composed of medium to very fine sand; Wentworth 1922; Table 1). All other raw materials are rare or completely absent, which is to be expected given the upstream geology of the quartzite-rich Klein Winterhoek Mountains (Fig. 1a). Only a minority (21.3%) of the Atmar Farm artefacts is in fresh condition (Table 1).

A typological assessment of the Atmar Farm assemblage is presented in Table 2. Overall the assemblage provides a limited sample of formal tools (n = 7; 2%), cores (n = 26; 7.5%) of which 12 are casual cores with only one or two removals, and complete flakes (n = 35; 10.1%). The majority of material (79.4%) comprised flaking debris. Split cobbles were also recovered (other types; n = 3; 0.9%). Complete flakes (n = 35) have a higher proportion of side-struck specimens (n = 14; 40%), while corner-struck types (or special side-struck types; Isaac & Keller 1968) account for 34.3% (n = 12) and end-struck types for 23% (n = 8); a single core trimming flake was also recovered. The core sample (n = 26) is dominated by simple reduction strategies on quartzite cobbles. The majority of all cores has only one or two removals, but some do retain a greater number

TABLE 1. *Raw material and artefact condition data for Atmar and Bernol Farms. Bracketed values indicate percentages. Quartzite is divided into coarse (C) and fine (F) types.*

Site	Raw material	Artefact condition				Total (%)
		Fresh/ unabraded	Slightly abraded	Heavily abraded/rolled	Weathered	
Atmar	Quartz	1 (0.3)	–	–	–	1 (0.3)
	C Quartzite	1 (0.3)	7 (2.3)	6 (2)	–	14 (4.7)
	F Quartzite	61 (20.3)	67 (22.3)	151 (50.3)	–	279 (93)
	Siltstone	1 (0.3)	–	–	–	1 (0.3)
	Hornfels	–	–	–	4 (1.3)	4 (1.3)
	Indeterminate	–	–	1 (0.3)	–	1 (0.3)
	Total	64 (21.3)	74 (24.7)	158 (52.7)	4 (1.3)	300 (100)
Bernol	C Quartzite	–	–	–	–	–
	F Quartzite	14 (73.7)	5 (26.3)	–	–	19 (100)
	Total	14 (73.7)	5 (26.3)	–	–	19 (100)

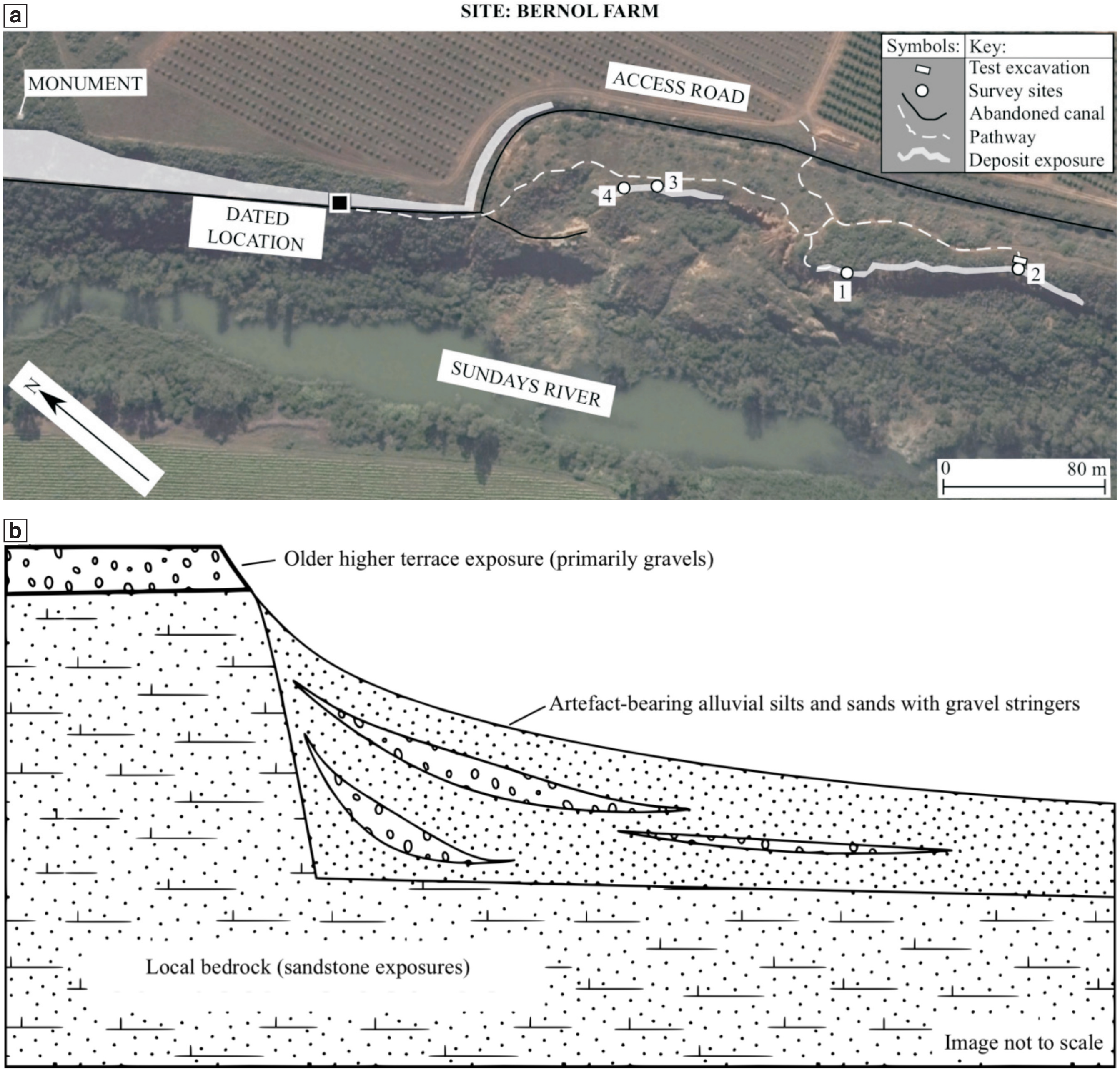

FIG. 4. *Bernol Farm:* (**a**) *plan view; and* (**b**) *stratigraphic sequence at the dated location (modified after Granger* et al. *2013).*

of scars, like the bifacial chopper-cores (>3 but <10 scars; Fig. 6). More structured knapping is present in only two cores (discoids; 7.7%), and three cores with an unstructured knapping strategy are also present (irregular; 11.5%).

The formal tool assemblage at Atmar Farm comprised only seven pieces, six of which are shown in Figure 6, and the majority is made on quartzite. Large cutting tools (LCTs) (n = 3) consist of a single cleaver, a biface (minimally worked and lacking a clearly convergent distal end) and a unifacial hand-axe on hornfels, all of which are produced on large flake blanks (see below for details). A single bifacial chopper (with edge use-wear damage), a notch on a large flake, and two retouched pieces (denticulate and denticulated scraper) make up the remaining formal tool assemblage. The retouched pieces and the chopper are made on complete flake blanks in quartzite (>10 cm in maximum length for the chopper). A tertiary flake (no cortex on the dorsal surface or platform) was used to produce the chopper, and the chopping edge is characterised by several bifacial removals at the distal end of the piece. For the retouched flakes, cortex is present on both dorsal surfaces, and both pieces are characterised by retouch that occurs along the edge on one face and then on the opposite face on another edge (two edges), located in the distal and mesial portions of each flake. This retouch is primarily discontinuous and non-invasive across all tool edges, although it is more extensive along the distal edge of the denticulate (Fig. 6f), and retouched edges take on a denticulated appearance.

The extremely poor state of preservation of the LCTs restricted detailed analysis; although, some basic conclusions can be made. Large flakes are used for the LCT blanks, all of which are corner-struck and retain a portion of the outer cortex of the knapped cobbles. These flakes all exceed 10 cm in maximum length, and the number of removals is kept to a minimum but provides some degree of edge shaping. Removals in the bulbar area of the flake (to reduce tool thickness) are not present and the majority of removals are towards the lateral

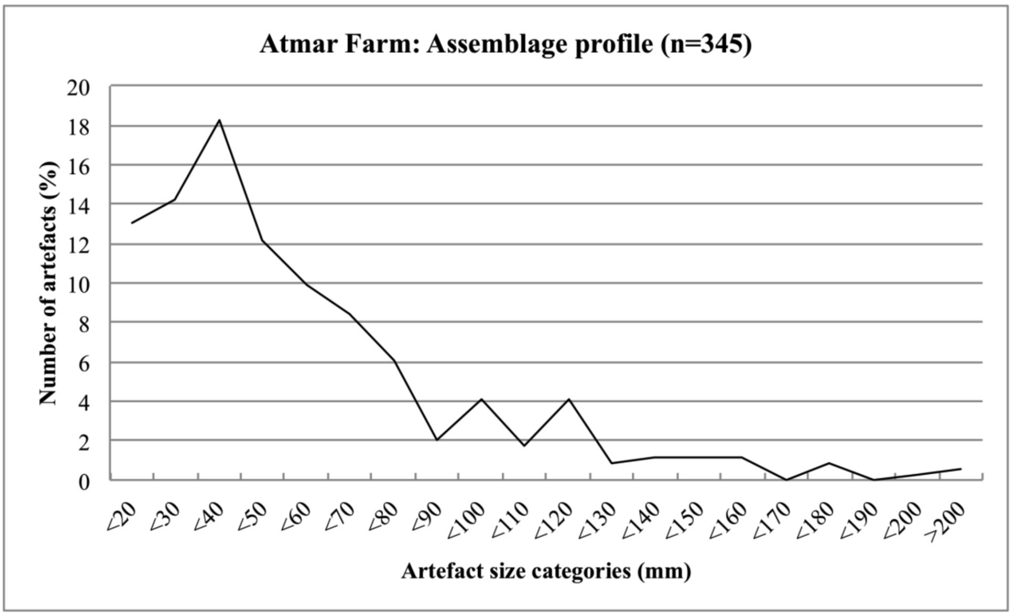

FIG. 5. *Artefact size distribution for the Atmar Farm assemblage.*

edges of the pieces. It appears that the flake blanks utilised for LCT production were already thin and of the necessary shape prior to any subsequent shaping (primary scars that shape a blank, or secondary working that refines the edges). Tip shape for the unifacial hand-axe and biface is generalised convergent, and convergent oblique for the cleaver (McNabb *et al.* 2004).

BERNOL FARM

Survey work at Bernol Farm has provided 19 pieces, all better preserved than those at Atmar Farm. Unfortunately, our test excavation proved to be unsuccessful as the deposit was young based on the presence of Iron Age pottery. No Stone Age artefacts were recovered. Thus, the artefacts discussed here are those that were collected eroding from the deposits at the dated location and the four survey sites. This sample therefore represents a biased collection. In addition to lithics, bone and shell fragments were found at both the survey sites and the dated location, both at the surface and from *in situ* positions. The fragmented and poorly preserved nature of this bone and shell meant that detailed analysis could not be pursued.

Artefact condition and raw material data are presented in Table 1. All of the selected artefacts are made on fine quartzite. By condition, this fine quartzite contains both a fresh/unabraded portion (n = 14; 73.7%) and slightly abraded component (n = 5; 26.3%). No artefacts sampled from Bernol Farm are weathered or heavily abraded/rolled.

A typological assessment of the Bernol Farm assemblage is presented in Table 2. We collected 11 LCTs, which demonstrate that Acheulean is present in the area (Fig. 7), plus four cores, three flaking debris pieces, and a single end-struck complete flake. The large size of the cores and flake is notable. The single end-struck complete flake has a maximum length of 132.5 mm, and one of the discoidal cores has a maximum length of 168 mm. Although not collected, a boulder-core was also found in the abandoned sand-filled canal at the dated location, having eroded out of the adjacent deposit. It clearly illustrates the use of boulder-cores for obtaining large flakes (presumably for use as tool blanks).

The formal tool assemblage at Bernol Farm comprises 11 LCTs (Fig. 7). Cleavers dominate the sample (n = 6), followed by hand-axes (n = 3), and a single pick and biface. A basic technological assessment of these LCTs shows some interesting

TABLE 2. *Assemblage classification for Atmar and Bernol Farms.*

	Atmar		Bernol	
	n	%	*n*	%
Flaking debris				
SFD	45	13	–	–
Chunk	9	2.6	–	–
Incomplete flake	155	44.9	3	15.8
Flake fragment	65	18.8	–	–
Total	274	79.4	3	15.8
Complete flakes				
End-struck	8	2.3	1	5.3
Side-struck	14	4.1	–	–
Corner-struck	12	3.5	–	–
Core trimming	1	0.3	–	–
Total	35	10.1	1	5.3
Cores				
Core fragment	3	0.9	–	–
Casual	12	3.5	–	–
Chopper-core	6	1.7	2	10.5
Discoidal	2	0.6	2	10.5
Irregular	3	0.9	–	–
Total	26	7.5	4	21.1
Other				
Split cobble	3	0.9	–	–
Total	3	0.9	–	–
Formal tools				
Hand-axe, unifacial	1	0.3	–	–
Hand-axe, bifacial	–	–	3	15.8
Cleaver	1	0.3	6	31.6
Pick	–	–	1	5.3
Biface	1	0.3	1	5.3
Chopper	1	0.3	–	–
Notch	1	0.3	–	–
Scraper, denticulated	1	0.3	–	–
Denticulate	1	0.3	–	–
Total	7	2.0	11	57.9
Assemblage total	345	100	19	100

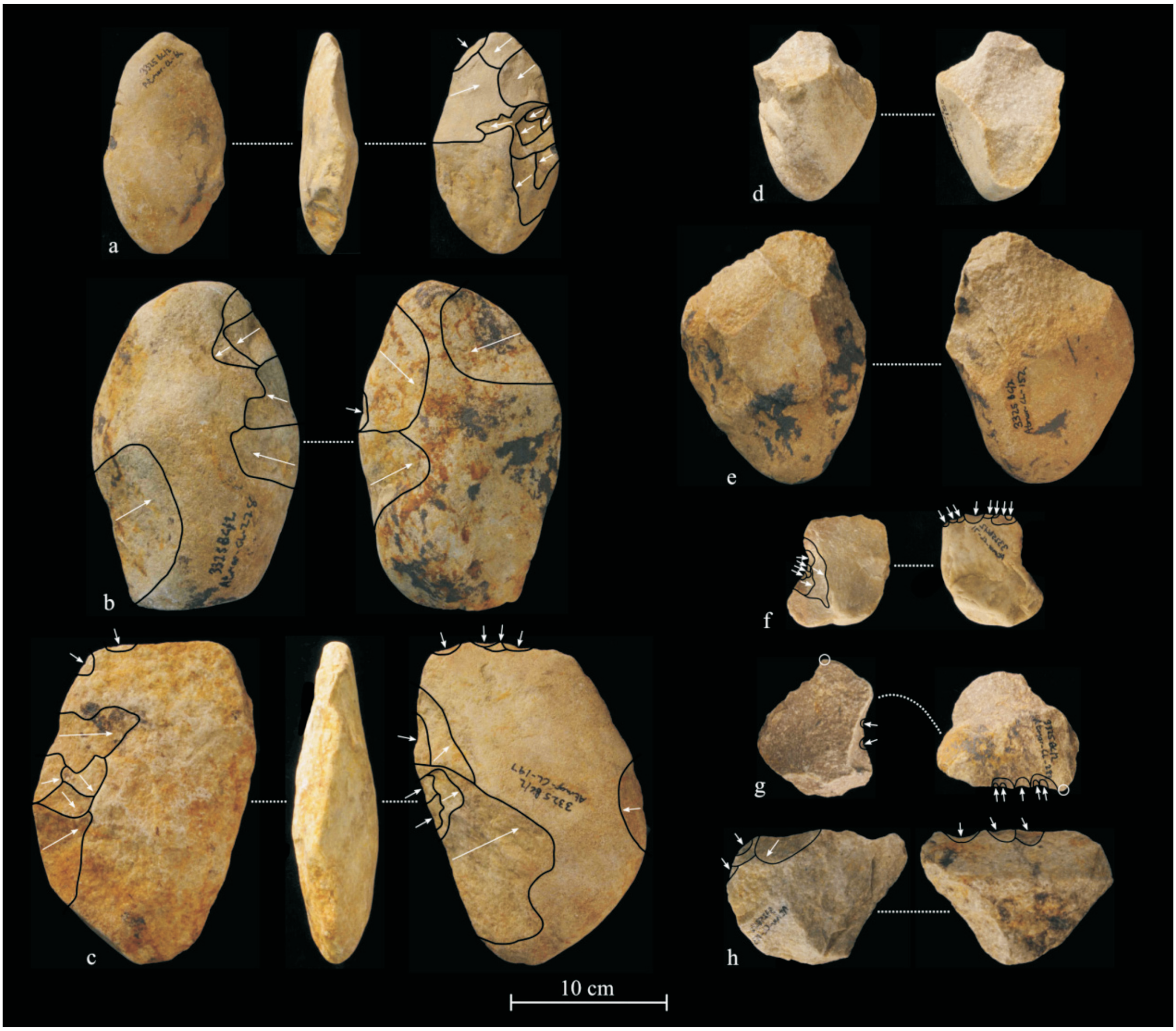

FIG. 6. *Atmar Farm formal tools and cores, with black lines indicating flaking scars and white arrows indicating flaking directions:* (**a**) *unifacial hand-axe;* (**b**) *biface lacking convergent distal end;* (**c**) *cleaver;* (**d**–**e**) *bifacial chopper-cores;* (**f**) *denticulate;* (**g**) *denticulated scraper (white circle indicates ventral and dorsal views of the same corner, respectively);* (**h**) *bifacial chopper.*

trends. LCT size and shape data show that, by weight, cleavers and picks are the heaviest pieces. Cleavers also account for the lightest piece, showing the greatest variation for this attribute. Length, width, and thickness measurements show that the pick and cleavers are the largest pieces, followed by the smaller biface and hand-axes (Table 3). Generalised convergent shapes are the most common tip type for the LCTs ($n = 7$; McNabb *et al.* 2004), and large flake blanks are favoured for tool production (Table 3). LCT reduction shows that the majority of the sample ($n = 8$) is flaked bifacially, while a single cleaver is unifacial and another is partly bifacial, thus showing that cleavers have multiple flaking patterns (Table 4). As expected, the distribution of cortex is most common towards the base of the LCTs, although this does not exceed 50% on any of the LCTs (Table 4).

DISCUSSION

ATMAR FARM

The Atmar Farm assemblage conforms to what can be expected for a secondary context alluvial gravel deposit of relatively high energy. The SFD component is minimal, with only 13% <20 mm in size, and the size distribution illustrates a bias towards pieces in the 20–80 mm category; those that are larger are present but infrequent. Studies investigating the size distribution of artefacts (Schick 1987, 1991, 1997; Kuman & Field 2009) show that a high percentage of SFD (60–87%), coupled with a full size range of artefacts and the presence of flakes and cores, characterises a site of primary knapping activity. Low SFD percentages are likely due to the removal of these components by some kind of natural site modification process, and/or, the possibility that knapping did not take place on-site (Schick 1987, 1991, 1997; Kuman & Field 2009). A basic typological analysis at Atmar Farm indicates that both cores and flakes occur within the gravels, and the majority of these retain some cortex. This overall pattern suggests that knapping did occur within the catchment of Terrace 10, but water winnowed the assemblage of SFD.

Artefact condition and raw material data further illustrate the influence of these fluvial forces, clearly seen in the modified condition of the primarily quartzite artefacts (97.7%). The composition and hardness of a rock determine the way in which an artefact responds to weathering and abrasion, and

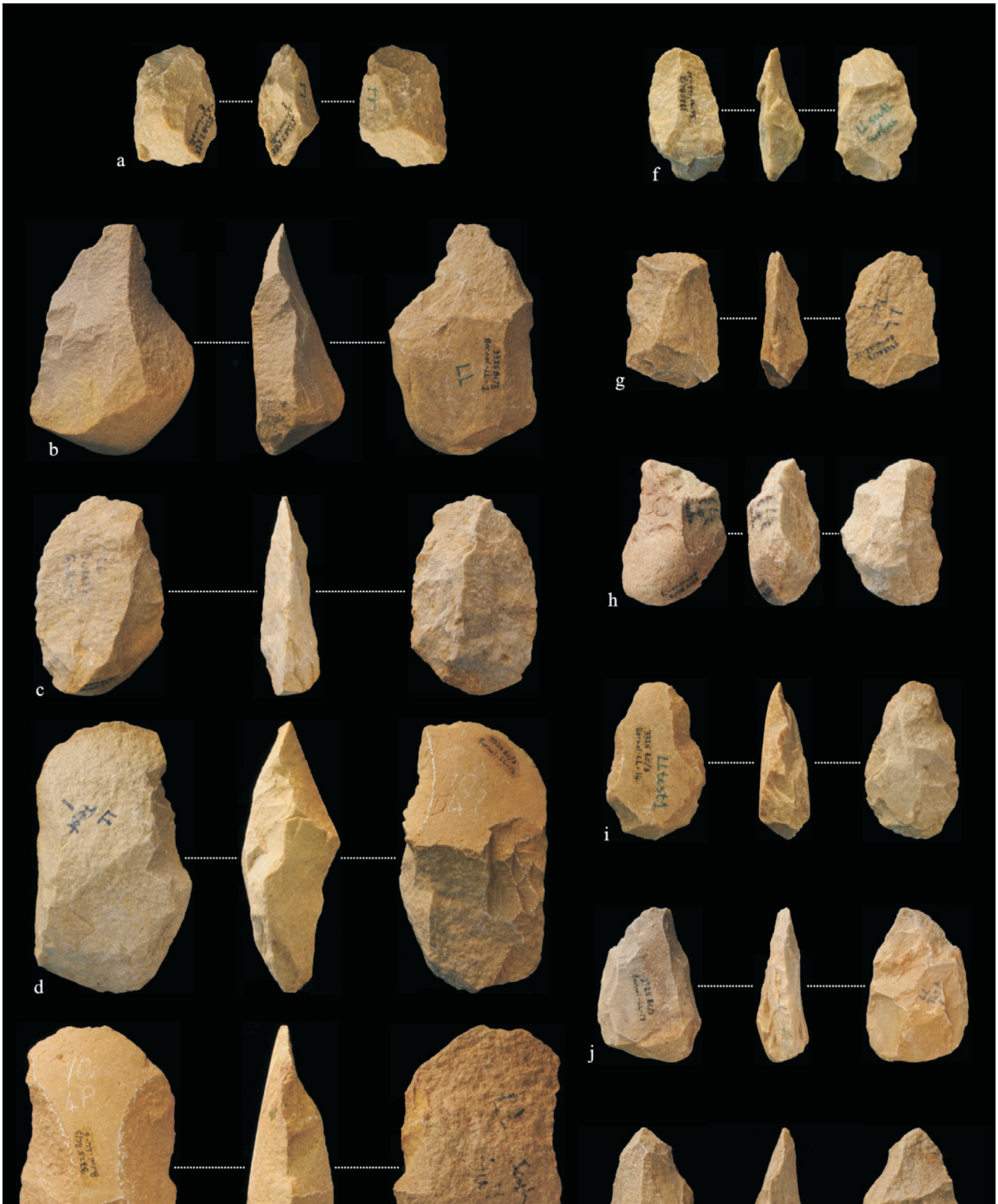

FIG. 7. *Bernol Farm LCTs:* (**a**) *biface;* (**b**) *pick;* (**c**–**h**) *cleavers;* (**i**–**k**) *bifacial hand-axes.*

TABLE 3. *Bernol Farm LCT dimension and blank type data.*

Bernol Farm LCTs (*n* = 11)		Pick (*n* = 1)	Biface (*n* = 1)	Hand-axe (*n* = 3)	Cleaver (*n* = 6)	
Dimensions						
Weight (g)	Min	963.5	148.9	220.3	119.9	
	Max			364.3	999.3	
	Mean	–	–	268.8	474.7	
Length (mm)	Min	165	79	102	90	
	Max			120	173	
	Mean	–	–	108.7	126.8	
Width (mm)	Min	108	53	64	51	
	Max			74	102	
	Mean	–	–	68.3	78	
Thickness (mm)	Min	62	40	32	27	
	Max			48	72.6	
	Mean	–	–	37.7	44.9	
Blank type						Total
Flake		1	–	3	5	9 (81.8%)
Indeterminate		–	1	–	1	2 (18.2%)
Total		1 (9.1%)	1 (9.1%)	3 (27.3%)	6 (54.5%)	11 (100%)

TABLE 4. *Bernol Farm LCT reduction and percentage of remaining cortex data.*

Bernol Farm LCTs	Reduction			Remaining cortex (%)				
	Bifacial	Partly bifacial	Unifacial	0	1–24	25–49	50–74	75–100
Pick (*n* = 1)	1	–	–	–	–	1 (9.1%)	–	–
Biface (*n* = 1)	1	–	–	1 (9.1%)	–	–	–	–
Hand-axe (*n* = 3)	3	–	–	–	1 (9.1%)	2 (18.2%)	–	–
Cleaver (*n* = 6)	3	2	1	2 (18.2%)	3 (27.3%)	1 (9.1%)	–	–
Total	8 (72.7%)	2 (18.2%)	1 (9.1%)	3 (27.3%)	4 (36.4%)	4 (36.4%)	–	–

these observations reflect the type and intensity of the erosive process/es involved (Shackley 1974; Pappu 1996; Shea 1999; Holmes *et al.* 2008; Thompson 2009). The vast majority (78%) of the artefacts at Atmar Farm have slightly to heavily abraded/rolled exterior surfaces, which suggests that the artefacts were reworked within the fluvial system for a considerable period of time (Shea 1999). Fresh artefacts are less common, which suggests their inclusion in this system took place at a later point in time, or that their transport downstream took place over a shorter distance prior to deposition (Shea 1999). Conversely, the opposite could be said for those more abraded pieces. The absence of non-lithic material is also likely linked to these fluvial conditions, where heavy abrasion would limit any kind of organic preservation.

Despite the poorly preserved nature of the Atmar Farm assemblage, some basic trends can be highlighted about this material, dating to *c.* 0.65 Ma and thus belonging to the Later Acheuelan. Overall, quartzite is most favoured for artefact production, and the use of naturally occurring rounded to sub-rounded quartzite pebbles and cobbles appears to have influenced the large number of simple casual cores and chopper-cores. These cores are minimally reduced (with low scar counts) and the overall percentage of remaining cortex is high. Flake scars are also small, suggesting that larger blanks for LCTs were struck from cores elsewhere, or that the cores from which they were struck were not incorporated into the deposit. A single core trimming flake suggests an appreciation for core management, although more highly reduced cores are rare. These patterns are likely due to the high abundance of local raw materials in gravels nearby, where cores could be tested at will to ascertain flaking properties. The large sample of casual cores would attest to this, coupled with the generally high percentage of cortex retained in all of the cores.

Although the formal tool sample is only seven pieces, it shows that flake blanks, predominantly in quartzite, are favoured for tool production. The two retouched artefacts show little standardisation in edge refinement, and retouch is generally sporadic, discontinuous, and non-invasive. Although these pieces illustrate simplicity in their production, the sample is inadequately small and may not be representative of the industry. The three LCTs at Atmar Farm made on large corner-struck flake blanks show minimal shaping and edge refinement, presumably because the flake blanks utilised for LCT production were well-suited and thin to begin with, reducing the need for intense reduction. Conversely, a single quartzite biface shows more invasive shaping and minimal edge refinement. The reduction of LCTs at Atmar Farm is thus variable in this small sample.

BERNOL FARM

Data for Bernol Farm are limited as we did not have time to excavate more than a single test trench, and what we did uncover here was a very young deposit that lacked Stone Age material. However, the context of our selected finds confirms that diagnostic Acheulean artefacts – in much better condition than those at Atmar Farm – are present in secondary context in gravels and gravel stringers, as well as in fine sediments at the location dated to *c.* 1.14 Ma. The survey sites, however, need further investigation to determine their alluvial *vs* colluvial nature. Nevertheless, reworking of artefacts appears to have been limited, and perhaps this indicates that transport of these artefacts took place over only a short distance (Shea 1999; Thompson 2009). In addition, the presence of bone and shell at Bernol Farm attests to favourable preservation conditions for non-lithic material.

Bernol Farm has provided a small (n = 19) sample of selected quartzite artefacts, comprising primarily of formal tools (n = 11 LCTs), and so little can be said about assemblage characteristics. However, it is apparent that the production of large flakes occurred locally as there are large flake scars on the cores. This is also seen in the LCTs as the majority is on large flake blanks. It also appears that boulder-cores were reduced locally to provide large flakes, possibly serving as LCT blanks. These large cores may have been located close to the original river at the time, or they may have been sourced away from the river higher upslope, where older river terraces contained suitably large material. The LCTs vary in form, size, shape, and reduction, which could suggest significant variability in this open-air context. Without a larger sample of LCTs and without a more detailed core analysis, we cannot provide robust conclusions about their production.

CONCLUSION

Well-dated Acheulean sites in southern Africa are few, and in the Eastern Cape these have been completely absent. Thus, there is a need to locate more ESA sites within datable contexts so that we can expand our understanding of this region's early archaeology. This research has sought to address this issue.

Overall, Atmar Farm is a low-quality fluvial site that provides a small poorly preserved Later Acheulean assemblage from Terrace 10. It is clear that the Atmar Farm assemblages are a product of their high energy alluvial context. However, with more surveying on the property, it may be possible to find denser concentrations of artefacts elsewhere, both in the gravels and potentially also in the fine sediment overburden, which may be datable with optically stimulated luminescence (OSL). Terrace 10 exposures are not only found at Atmar Farm; others occur elsewhere in the valley that may be more favourable for excavation.

Bernol Farm provides a complex exposure of Terrace 9 deposits that are rich in artefacts. A major issue is understanding the contextual nature of the survey sites and how these relate to the dated alluvium. Irrespective of this, Bernol Farm does preserve Early Acheulean artefacts of good condition in fine alluvium, a general rarity in South Africa's Acheulean, along with partially fossilised bone and other shell fragments. Therefore, the potential of this site is high, and with careful survey and excavations in the future, this site may provide some well-preserved Acheulean assemblages from which we can further enhance our understanding of the local Acheulean Tradition.

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