

Chapter 9

A Middle Paleolithic Assemblage from Jebel Barakah, Coastal Abu Dhabi Emirate

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Introduction

Until recently, our knowledge of the Paleolithic period in Arabia has been limited. Occasional Paleolithic tools were collected and reported early in the last century, such as the discovery of a Lower Paleolithic handaxe from central Arabia (Cornwall, 1946). Geological teams exploring Arabia for its mineral wealth reported on the identification of Acheulean implements (Field, 1971; Overstreet, 1973). In the late 1970s, knowledge concerning the Paleolithic of Arabia began to change as archaeologists began a systematic, five year comprehensive program to survey various provinces of Saudi Arabia. A large number of archaeological sites, of varying periods, were discovered across the country. As a result of survey efforts, nearly 200 Acheulean and Middle Paleolithic sites were discovered in the central, western and south-western provinces. Of special importance were three old sites, namely, Shuwayhiyah in the north, site 226-63 near Najran in the south and Tathlith in the southwest of Saudi Arabia. These sites were thought to belong to an early part of the Pleistocene on typological grounds (Whalen and Pease, 1992). In addition, important research into the Middle Paleolithic along the Red Sea coast has progressed and a

possible Lower Paleolithic site has been reported in central Saudi Arabia (Petraglia and Alsharekh, 2003; Alsharekh, 2007). The only in situ, dated site excavated in Arabia is that of Saffāqah, near Dawādmi in central Saudi Arabia (Whalen et al., 1983; Petraglia et al., 2009). Uranium–thorium dating has placed Acheulean artifacts to a minimum of 200 ka (Whalen et al., 1982). In southern Yemen, the discovery of five pre-Acheulean sites has been claimed within the Hadhramaut Mountains (Whalen et al., 1982).

Archaeological work on the Paleolithic of the Persian Gulf began in the early 1990s. A number of international expeditions discovered Pleistocene sites in Abu Dhabi Emirate (McBrearty, 1993) and in Sharjah in the United Arab Emirates (Scott-Jackson and Scott-Jackson, 2006; Uerpmann et al., 2006, 2009; Scott-Jackson et al., 2009), as well as in neighboring Oman (Rose, 2004, 2005, 2007; Rose and Usik, 2009).

Genetic studies have recently been introduced in Arabia and evolutionary geneticists have begun to appreciate the major role that Arabia must have played in the origin of modern humans. New genetic evidence has highlighted the significance of the Arabian peninsula as a corridor for early human migration to and from Africa (Abu-Amero et al., 2007, 2008; Petraglia, 2007; Cabrera et al., 2009; Rídl et al., 2009).

Although prehistoric research in the Arabian peninsula is still in its infancy, the present book is a sign of the importance of prehistory on the peninsula. It will hopefully encourage more archaeological work in this vast and vital area bridging Africa and southwest Asia. New Paleolithic evidence discovered at Barakah, on the Gulf, promises to provide a wealth of data to explore questions surrounding Paleolithic occupation of the eastern end of the peninsula.

Geomorphology of Jebel Barakah

Jebel Barakah is located on the west coast of Abu Dhabi Emirate, overlooking the sea between Jebel Dhannah and the Qatar peninsula (Fig. 1). The coastline of Abu Dhabi is

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Fig. 1 Location of Jebel Barakah in the Western Region of Abu Dhabi Emirate (after Whybrow and Hill, 1999)

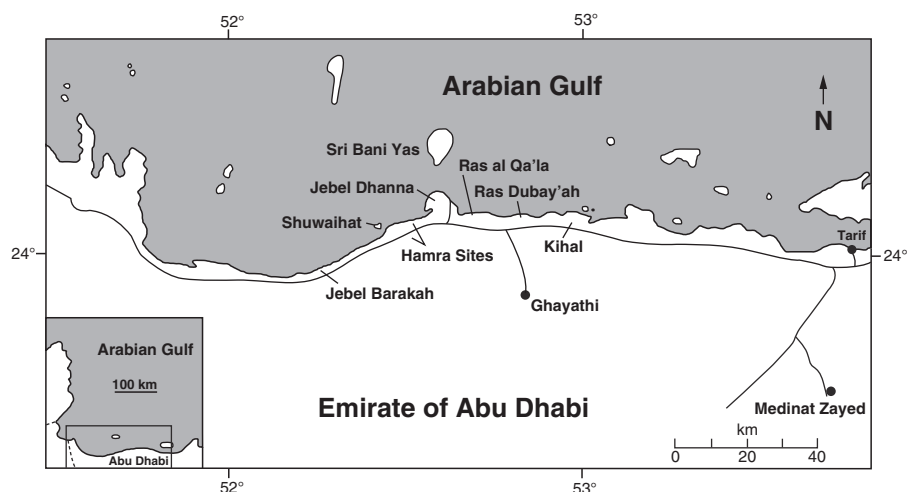


Fig. 2 Jebel Barakah looking north

generally low and dominated by sabkha (salt land) with occasional sand hills and low grass vegetation. Jebel Barakah, at 62.6 m above sea level, is the highest point along this stretch of coastline. It is an isolated outcrop composed of red sandstone (originally wind-blown sand) and thin bands of conglomerate (originally water-transported, wadi pebbles). The outcrop, oval in shape, occupies a low plateau of 2.5 km from north to south and 2 km from east to west (Fig. 2). The international road to Saudi Arabia and Qatar divides the plateau into two sections. The larger northern section is the most important as it has yielded all the Upper Miocene fossils discovered at Barakah, as well as Paleolithic artifacts. The southern section is disturbed, and partly occupied by new installations. Newly opened tracks have been built in the northern section to serve the modern observatory built by the army at the northern side of the Jebel. Construction of this structure resulted in the exposure of the upper sections of the Baynunah geological formation.

The Jebel, a small outcrop with a narrow flat summit and sloping surfaces, occupies about 1 km² of the north-western

side of the plateau. Like most of the outcrops in the western region of Abu Dhabi Emirate, the Jebel is capped by narrow, flat summits and covered with a layer of deflated cherts. The eastern most end of the Plateau is high ground, separated from another similar high ground to the west by low ground which seems to have been formed by water and natural erosion. A lower ground surface with pronounced outcrops separates these two areas from the Jebel. The low and wide gullies, formed by rain, slope down towards the sea (Fig. 2).

The exterior edges of the plateau are indicated by a series of pronounced cliffs formed by gushes of rain water. The international highway (Abu Dhabi-Qatar) cuts the southern part of the plateau, a large distance from the Jebel itself. The Jebel is the last elevated area as you head westwards towards Sabkhat Matti.

Prior to the recent archaeological discoveries, Jebel Barakah was probably best known for its Late Miocene fossil remains (Whybrow and Hill, 1999). Part of the sea cliff contains the type section for the Baynunah Formation, which covers the Shuwaihat Formation (Whybrow, 1989; Whybrow et al., 1999). At most outcrops of the Baynunah Formation, which covers the Shuwaihat Formation, the sequence is capped by a thick layer of resistant tabular chert-flint (cryptocrystalline siliceous rocks produced by diagenetic solution).

The lithic material from Jebel Barakah was first reported by McBrearty (1993, 1999). She noted that a large number of artifacts occurred on the level bluffs on the southeast side of the Jebel (McBrearty, 1999: 378). The artifacts lie directly on Baynunah Formation rocks; upslope they are overlain by a thin superficial layer of soft unconsolidated sediment derived from the exposures of the Baynunah Formation above. McBrearty also reported that the Barakah artifacts demonstrate a highly consistent and formalized flaking method, being composed almost entirely of radial

cores and the flakes derived from them. All 16 cores collected by McBrearty are radial or high-backed radial form. There was no trace of any blade element. The aim of this chapter is to introduce new findings from Jebel Barakah, providing evidence to support that the site represents a Middle Paleolithic locus.

Jebel Barakah: Archaeological Localities

The lithic material provided here and currently under study by the first author was collected by staff members of Abu Dhabi Authority for Culture and Heritage (ADACH). The lithic material from Localities One to Three have already been discussed (Wahida et al., 2008). Two added Localities (Four and Five) with more material were discovered in January 2008, together with further material being collected from Locality Two.

Locality One (BRK0001), is situated on the north-west and western side of the Jebel, between the sea cliffs and the first line of ridges up the slope, a distance of about 300 m. Artifacts were scattered on a thin layer of soft soil derived from the exposure of the Baynunah Formation outcrops. Much of the lithic artifacts along the cliffs must have been eroded away to the Gulf along its substantial cliffs. Upon further study this season, it was noted that this Locality covers a wider area than initially anticipated. It covers the western section and extends beyond the Jebel from the northern side.

Locality Two (BRK0002), is located to the south and southwest side of the Jebel, and descends southwards away from the Jebel. A few artifacts were collected from the western section of this locality in 2007. Additional lithics have been collected from the eastern section of Locality Two this season though the total count of artifacts is small. Locality Three (BRK0003) lies to the eastern slope of the Jebel providing a small number of artifacts. McBrearty's lithic material may have come from this locality. Locality Four (BRK0004) lies to the east of the Jebel and unlike Localities One to Three, it is separated from it by low-lying, flat ground. It is an irregular, long and narrow outcrop, extending north-east south-west and rising about 4 m above sea level (ASL). The irregular surface of the outcrop, which extends about 200 m, consists of soft soil mixed with quantities of chert-flints and small gravels.

Locality Five (BRK5) is a long plateau measuring about 250 m long with a triangular shape, and it is located about 400 m to the north of Locality Four. The site which is only about 120 m away from the beach represents a peninsula of wide and flat surface, surrounded by two wide gullies from the east and west. Its elevation is about 4 m ASL and has a low ground extension at the north eastern side with an elevation

of 3 m ASL. Both sides of the peninsula have been extensively damaged by rain erosion. Stone artifacts have been collected from both areas but were more prominent on the main peninsula. It should be noted here that subsequent to the initial reconnaissance that a small number of artifacts were discovered to the east of Locality Five and south-east of Locality Two.

The Lithic Assemblage

The five localities at Barakah appear to represent a single techno-typological industry. It should be stressed here that study of the Barakah assemblage is still in its preliminary stages and further analysis has been planned, including detailed artifact analysis and comparable study with other sites in the region.

The lithic collection strategy was determined by erosion and deflation that the five localities had suffered. Laying down a grid for a systematic collection of artifacts would have been of little use. Instead, a system of latitudinal and longitudinal coordinates for each artifact was obtained by Global Position System (GPS). In cases where a number of implements were located within a 5 m radius, one reading was obtained for the group as they lay within the possible area of error of the system. For fear of possible looting of artifacts, it would be unwise to publish those readings before the new Antiquity Law of the Abu Dhabi Emirate is in force (Beech, 2006). It is for this reason that the precise position of artifacts are only recorded with general dots on the map (Fig. 3).

The Barakah artifacts were made of good quality flints, but had black to blue-black patina. The artifacts were unlike those found by McBrearty and more numerous. Beyond the

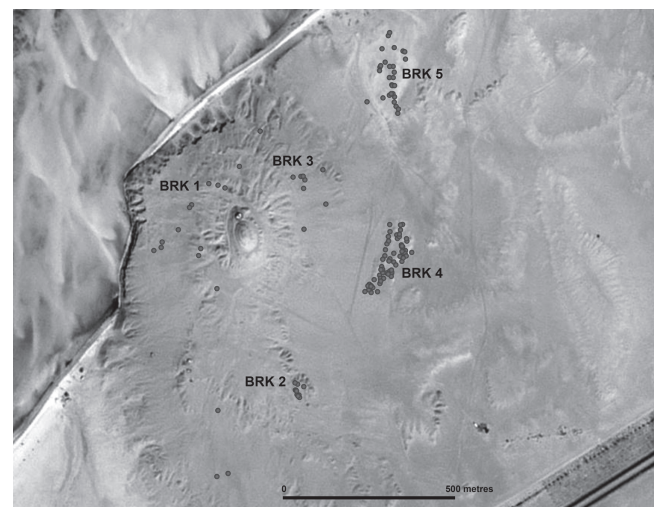


Fig. 3 Jebel Barakah, Localities One–Five, with distribution of artifacts

radial cores, McBrearty collected 218 objects, of which eight are modified flakes as tools. McBrearty suggested several dates for the Barakah assemblage, including probably the Acheulean, the Middle Stone Age assemblages and Mid- to Late-Holocene (McBrearty, 1999). The first of these three dates were based on the presence of radial and high backed radial cores from which the flakes originated. The youngest age was probably based on the presence of two broken implements: one a bifacial tip, and the other a flake with unifacial trimming. McBrearty is credited for her identification of the Middle Paleolithic artifacts although her limited collection of tool types gave her limited space for other conclusions to be drawn. McBrearty provided an excellent outline of the paleoenvironmental history of the Western Region of Abu Dhabi Emirate, including Barakah, to which little can be added. Although an attempt was made to locate McBrearty's material, at the time of publication the material cannot unfortunately be located.

Technology and Typology

The main technique of core reduction at Barakah was the prepared core method by radial flaking known as the Levallois technique. This technique requires the working face of the core to be specially prepared beforehand, allowing a predetermined flake of probable shapes to be detached. The underside of the core was partially flaked off around the edge and this was the case with all radial cores. The lithic assemblage was dominated by radial, high backed radial and discoid cores that reflect a tendency towards Levallois centripetal core strategy (Fig. 4a–f). The other technique was the bipolar whereby two flakes were struck off from two opposed ends of an elongated Levallois core. A third technique was probably that of Nubian Method Type One, where one Levallois flake core, oval in shape, had the last flake struck off from the thinner distal end. Two earlier removals from the thicker proximal end were probably part of the preparation

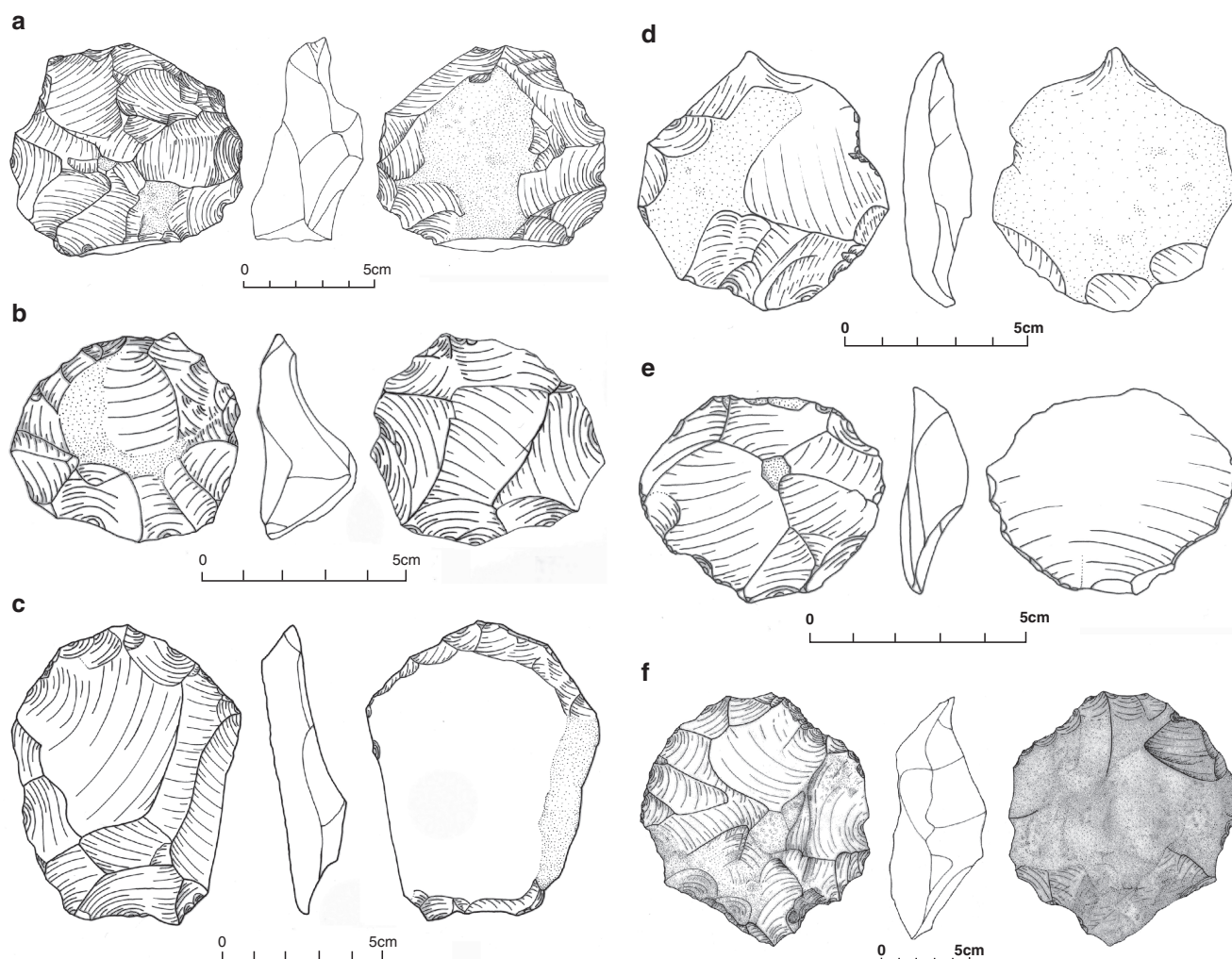


Fig. 4 (a) Bifacial centripital core; (b) high-backed radial core; (c) elongated bifacial core; (d) pointed bifacial discoidal core; (e) unifacial centripital radial core; (f) bifacial centripital radial core

technique (Fig. 5). Applying the Levallois technique of obtaining as many flakes as possible, the original large nodule of raw material was reduced in size, such that no more desired flakes were possible. As McBrearty (1999) noted, we agree that the assemblage displayed a very consistent and formalized flaking method, being composed almost entirely of radial cores and the flakes derived from them.

Among the 158 specimens collected from Localities Two, Four and Five, 49 radial, high backed radial or discoid cores were found. These cores were distributed as follows: Locality Two, 17, of which ten were cores. Among the 97 specimens collected from Locality Four, 28 were cores. Locality Five produced 44 specimens, of which 11 were cores. One bipolar Levallois core was found in Locality Four, and one Levallois flake core was found in Locality Five, bringing the total number of cores to 51.

The smallest radial core comes from Locality Four, and measures $4.1 \times 4.0 \times 1.4$ cm, whereas the largest radial core, comes from Locality Three, and measures $13.2 \times 12.3 \times 5.2$ cm. One handaxe was found in Locality Five. The base was broken towards the proximal end and would have been of cordiform type if complete. Combined shallow flaking and sinuous retouch have been applied to both sides, with the original cortex remaining on both sides, in the area closer to the proximal end. The retouch was confined mainly to a single side of the handaxe. A hard hammer was probably applied in the primary flaking and a soft hammer was likely used to produce the final flaking and retouching (Fig. 6).

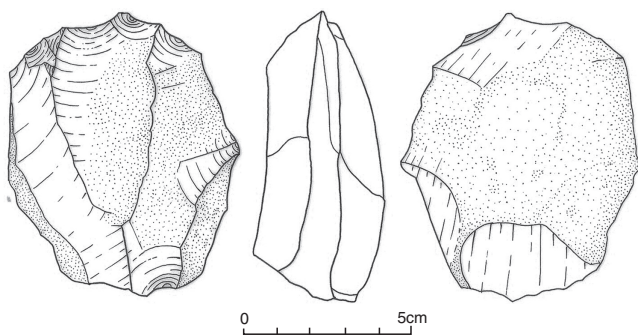


Fig. 5 Levallois flake core (probably of Nubian method type one)

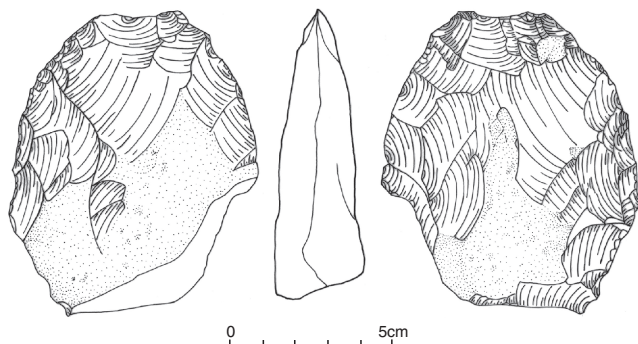


Fig. 6 Bifacial handaxe

Apart from some diagnostic types, the 19 registered tools included two side-scrapers (Fig. 7), 11 notches (Fig. 8), one denticulate (Fig. 9), two borers (Fig. 10) and several points (Fig. 11). One side-scraper, a bifacially retouched fragment on a thin tabulated flint, was found at Locality Five. The ventral retouch is shorter than that on the dorsal surface. Apart from the retouched area, the remainder of the fragment had cortex.

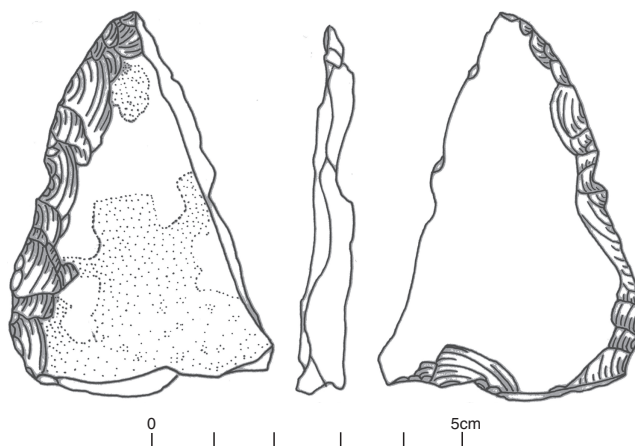


Fig. 7 Bifacial sidescraper

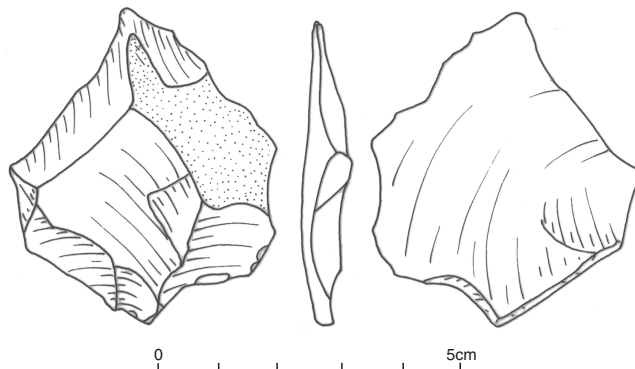


Fig. 8 Dorsally directed notch

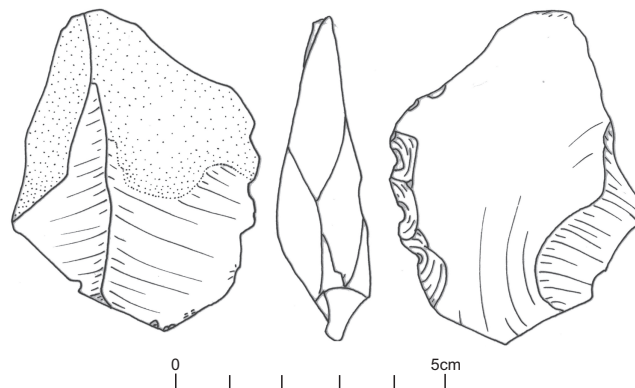


Fig. 9 Denticulate

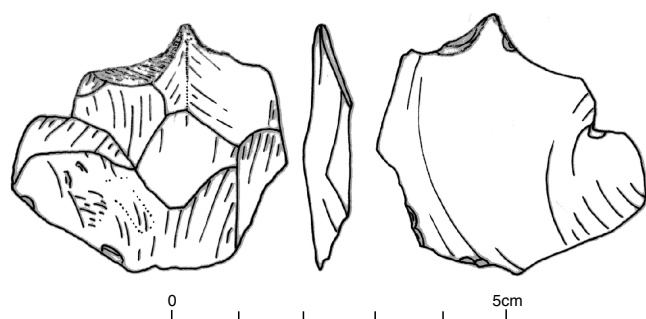


Fig. 10 Borer

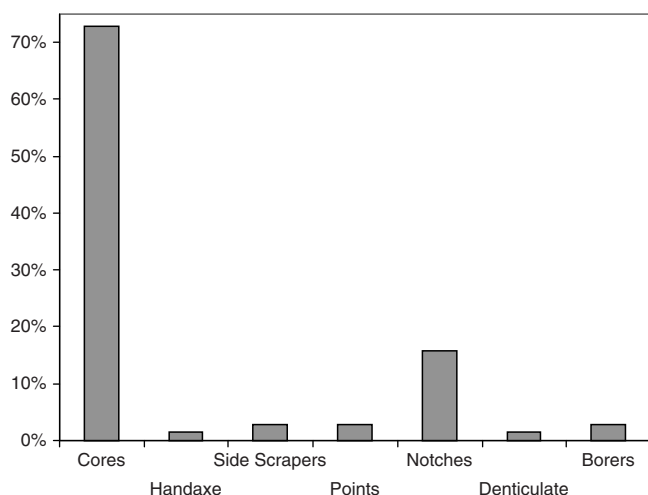


Fig. 11 The percentage of cores and tool types at Jebel Barakah

The notch concavities were made mainly by a single blow, and lack any form of deliberate retouch. The notch may be dorsally or ventrally directed or straight. These implements were an important component within the Barakah assemblage. Microwear and refitting studies (Keeley, 1977, 1980; Cahen, et al., 1979) showed that similar tools had one or more functions; including woodworking, splitting bone for the extraction of marrow and fashioning bone tools, hide cutting and piercing, butchering of animals and the preparation of plant food.

The number of primary flakes from the three localities (Two, Four and Five) is 110 in total, including specimens (complete and broken) that lack deliberate retouch. Three flakes have sharp edges or wide distal ends suitable for cutting or scraping. Three others have probably use-retouch on their sides. Nine flakes have their long axis shorter than their breadths. This small number of flakes is not unusual since their manufacture technique depends on the shape of the core and the force of the blow on the platform. Two of them have dorsal cortex.

Conclusions

It may be confidently stated that the Barakah assemblage belongs to the Middle Paleolithic period. This conclusion is supported by the presence of the Levallois centripetal radial strategy, and its resultant radial and discoidal cores, the presence of two Levallois flake cores, one of probably Nubian Method Type One and one bipolar as well as one typical handaxe of cordiform type. The assemblage also included one bifacial side-scraper fragment similar to those found in Nubian Mousterian Type B (Marks, 1968). The absence of blade elements and blade manufacturing techniques may suggest that the Barakah flake assemblage belongs to the early Middle Paleolithic. In this respect it is worth mentioning here that early Mousterian assemblages in the Levant (Shea, 2007), the Middle Stone Age of Africa (van Peer and Vermeersch, 2007; McBrearty, 2007) and the Middle Paleolithic of Arabia (Petraglia and Alsharekh, 2003; Petraglia, 2007) all had among their components blades and retouched tools such as endscrapers, points and burins. Obviously, the Barakah assemblage lacks any such 'Upper Paleolithic' elements. In some parts of the world Middle Paleolithic industries developed out of the Late Acheulean. At Barakah, there is no sign of any Acheulean elements.

The Barakah assemblage complements the recent discovery of Middle Paleolithic material elsewhere in the United Arab Emirates, Oman and Yemen. The stratified materials of Paleolithic industry, discovered at Jebel Faya in Sharjah Emirate has been dated by OSL dating to around 85 ka. Bedrock is still about 2 m below the present level of excavations (see Uerpmann et al., 2006; Marks, 2009; Uerpmann et al., 2009). This date has provided an approximate age of Paleolithic origins in the United Arab Emirates.

The Middle Paleolithic sites of southern Arabia complement the migration theory from Africa into Asia. If these sites were vestiges of the early migrants, this evidence supports the short crossing route theory along the Bab al Mandab waterway into Asia (Petraglia, 2007). The Barakah assemblage would present the most eastern extension of migrants into Arabia, probably during one of the pluvial phases associated with MIS 5. Paleoenvironmental conditions from southern Arabia indicate at least three pluvial conditions were associated with MIS 5e, 5a and 3 (Rose, 2004). Earlier climatic conditions in the Arabian peninsula during MIS 6 were too arid to support hunter-gatherer populations.

The very high ratio of cores indicates that Barakah was most probably used as a raw material workshop for a short interval of time, as artifact types were consistent and not mixed with other later tool types. It should be noted here that the Gulf during the time in question was a large river-system valley and the Barakah hominins were living in a world totally different from today. The Abu Dhabi Authority for Culture and Heritage (ADACH) is currently striving to protect

important archaeological and paleontological sites throughout the Emirate of Abu Dhabi. The discovery of the first Middle Paleolithic site in the Abu Dhabi Emirate should place the site, with its already known fossil rich Late Miocene deposits, at the highest level of protection.

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