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Lithics from the Emirates: the Abu Dhabi Airport sites

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Since research on the Neolithic period in the Arabian Peninsula was initiated, the main sources of knowledge have been surface scatters of flints (Field 1960; Crowfoot Payne 1963; Edens 1982). Until A.H. Masry (1974) conducted his excavations on coastal sites in eastern Saudi Arabia and recorded lithic assemblages from different archaeological layers, the dating of the stone tools remained uncertain.

In the past decade, more excavations of stratified sites have added to our knowledge about the chronology, economy and geography of Neolithic occupation in the Arabian Peninsula (Carter & Crawford 2001; Shepherd-Popescu 2003; Uerpmann M, Uerpmann H-P & Jasim 2000).

Based upon these recent results, our picture of the Arabian Neolithic has become more detailed. Palaeoecological research has revealed that the climate during the mid-Holocene period (9000–6000 BP) was generally more favourable than today. In the territory of the present day UAE, the regime of the monsoon offered regular rainfall twice a year (Burns *et al.* 1998). The higher precipitation affected the vegetation cover and led to the formation of freshwater lakes in the present day deserts of the Nafūd and the Rubᶜ al-Khālī (McClure 1988; Schulz & Whitney 1986). The vegetation-cover allowed the keeping of herds of cattle, sheep and goat, as indicated by the bone remains found at excavated sites. Although the details are still uncertain, it is most likely that these Neolithic groups were nomads, running a mixed economy with different activities allocated to different seasonal camp sites.

In contrast to the situation on the coast, where we have evidence from different stratified sites, our knowledge of inland settlements is limited. A large and informative site was recently excavated in the Emirate of Sharjah (Uerpmann M, Uerpmann H-P & Jasim 2000). Future research, focused on the economy and ecological behaviour of the Neolithic groups, depends mainly on sites with preserved archaeological layers, though surface sites are still of some value.

The importance of the Abu Dhabi Airport [ADA] sites lies in their geographical situation: not far from the present coast, opposite the island of Umm an-Nar, and on the route to the northern Emirates; a possible crossroads and stop-over point. This assumption is supported by the presence of the wells at ADA 1, although their precise date remains uncertain. It is likely that the site was located on the coast during the mid-Holocene maximum transgression.

The pottery assemblage recorded in the 1995 rescue excavation points to the presence of coastal communities during the Hafit, the Umm an-Nar and the Sasanian periods, as well as a late Islamic "re-occupation" (de Cardi 1997) as demonstrated by the 1995 records and the pottery clusters around the wells at ADA 1 (Beech, Kallweit & Hellyer 2004). Further excavation of the wells in the future may or may not demonstrate their existence during the periods in question. The surface finds at least provide evidence for a human presence there at several periods from the Neolithic onwards, which raises the question of the sites' function.

The excavations at the ADA sites have been described elsewhere in this volume (Beech, Kallweit & Helyer 2004).[1] Here I shall present the lithics from the 2002/2003 seasons. Only a preliminary examination has been carried out to date. A number of tools have, however, been drawn and studied in detail, and a first tentative statement can be given about the debitage from ADA 2 and ADA 7.

One remarkable difference between the flints from ADA 2 and ADA 7 is their colour, indicating their geological origin. At ADA 2, nearly all of the finds were of a translucent, brown, homogenous and fine-grained flint. Judging by its appearance, we can classify this flint as being that typically found in the coastal regions of the Emirate of Abu Dhabi, usually in or on flat outcrops of Tertiary origin, situated close to the coast. Other examples of this kind of flint are known, for instance, from sites on Dalma, Rumaitha, Bū Ḥasāʾ and Ruwais. The results of the 1995 examination of finds from the ADA sites indicated that this material occurred naturally in the vicinity. Most of the flints recorded from the surface collection and the sieving in ADA 2 are flakes or scatters of debitage, with approximately

one fifth being used or retouched. Among these used and retouched pieces, the overwhelming majority are drills or perforators (Fig. 1/1–5).

Among the finds from ADA 7, the composition of the raw material is different, with significantly more flints of different colour and texture than at ADA 2. There is no doubt that these flints are imports from different, still unknown, sources of raw material. A red and brown striped variety of flint resembles a raw material found frequently embedded in a highly weathered, brittle limestone along the mountains east of al-Ain. Other types of yellowish or grey-brown striped flints are of unknown origin. It is important to note that the flint pieces found at ADA 7 are on average larger in size than those from ADA 2. This may suggest that the artefacts on ADA 2 arrived there as a result of being blown by the wind, rather than being directly deposited by man. That still leaves unanswered, however, the question of why the raw material found on ADA 2 is restricted to the locally-available brown and translucent variety.

The selective presence of drills and perforators is also difficult to explain by the "wind-blown" hypothesis. Another detail, traces of bulldozing on ADA 2 and the partially aligned arrangement of hot spots are other arguments against the wind-blown hypothesis. More detailed examinations are necessary to understand the genesis of the ADA 2 site.

Among the tools found on the surface of ADA 1 and ADA 7 in the 2002/2003 season, two different tool types are remarkable. For the first time on the coast of the Emirates, tiny microliths are reported from ADA 1 and ADA 7 (Fig. 1/6–11). These are crescent-shaped, with a backed curve and a non-retouched, straight and sharp edge. On average, they are only 2 mm thick. The crescent is approximately 14 mm long and not more than 6 mm in width. Six pieces from the sites have been studied, described, drawn and recorded in the ADIAS lithics database. Two of them were recorded in the course of the 1995 rescue excavation.

Backed microliths comparable to the specimens from the ADA sites are rarely reported elsewhere in the Arabian peninsula. Among the lithic collection of Marāwah island, currently being studied by V. Charpentier, an almost identical piece has been identified. According to Charpentier, comparable pieces are present among material dating to the fifth millennium from excavated sites of coastal Oman (Charpentier, personal communication 2003). Apparently similar pieces are also known from shell-midden sites in the Tihāmah on the Red Sea coast (Zarins & al-Badr 1986: 43). These Tihāmah examples are made of "obsidian and quartzite" and have been called "backed lunates" (Zarins & al-Badr 1986: 43). Zarins and al-Badr compare those microliths with tools from the Levant, dating back to the fourth and third millennia BC. Unfortunately, however, they published no drawings of the objects and gave no precise information on their size and shape.

Unless further information becomes available, it is, therefore, not possible to determine whether the ADA artefacts are comparable to those from the western coast of the Peninsula. It is worth noting that the authors of the article on the Tihāmah microliths suggested that they were transverse cutters: a special form of a projectile point. The dimensions and design of the pieces found on the Abu Dhabi Airport sites are unlike those of transverse cutters. They appear, instead, to be designed to function as tiny single knives, hafted in a row in a wooden shaft.

At this stage of the research, there is evidence to date the microliths to the Neolithic period. If this is correct, they would be an exciting addition to the well-known Arabian Bifacial Tradition [ABT]. As an element of a larger composite tool, the microliths offer a wide range of interpretations. Hafted and fixed into a, most likely wooden, shaft, they may have served as a sickle-like cutting tool. Or they may have been used as a composite harpoon-like weapon. In fact, however, we have no indications about the microliths' use. It is impossible to determine from their design, or the traces of use on them, whether they were used to cut wild or cultivated cereal grasses, or if the pieces served as single teeth in a composite knife or projectile. The presence of potsherds from the Hafit and Umm al-Nar periods at the ADA sites, identified by B. de Cardi (1997), may suggest that some of the lithic material from the sites could also date to those periods. However, so far no microliths have been reported from any excavation or from surface sites dating to those periods.

Another important discovery from the 2002/2003 seasons, relating to the lithic technology in use at the ADA sites, is the find of two fragmented arrowheads at ADA 1, the first to be identified from the Airport sites. While one, ADA 1.33 (Fig. 2/2), is a medial fragment of a probably stemmed and winged arrowhead, the other, ADA 1.28 (Fig. 2/3) shows interesting details. With its large, emphasized wings and a straight base, ADA 1.28 is a rather unusual arrowhead type, identified here for the first time in the eastern part of the United Arab Emirates. Comparable types are known from further to the west, in collections of the so-called "western ar-Rubᶜ al-Khali Neolithic" (Edens 1982: 109–124). Similarly shaped arrowheads are also described by R.M. Gramly (1971: 177–185). From the Western Province of Abu

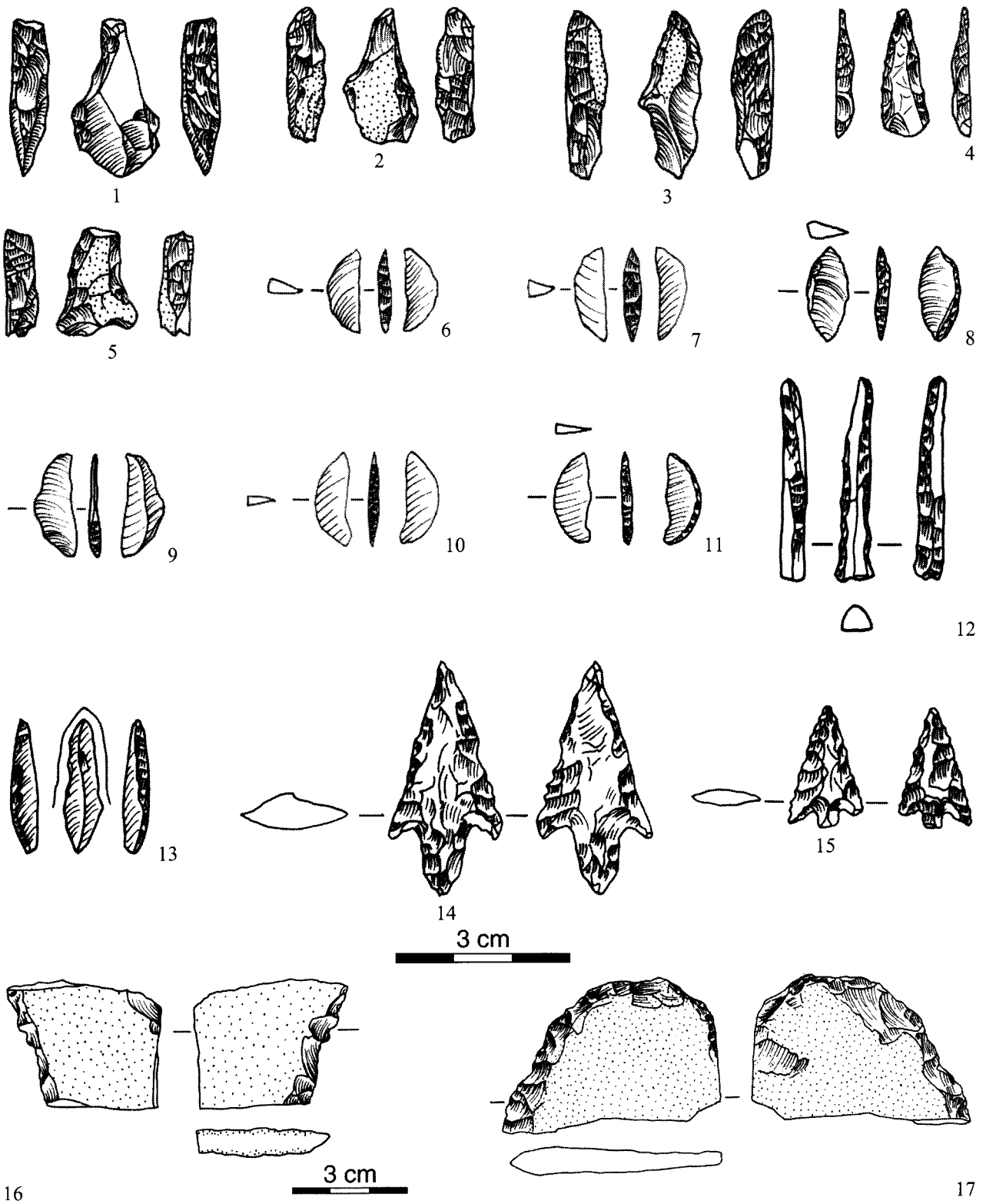

FIGURE 1. *Stone tools from the Abu Dhabi Airport sites and Dalma island sites.*

Dhabi Emirate, from the site of Bidaᶜ al-Muṭawwah another similar arrowhead is reported (Crombé 2000: 11, figs 2, 9, 10).

Gramly and Edens refer to stone tool assemblages collected from an area located on the western fringes of the Rubᶜ al-Khālī desert. Another similar arrowhead was collected from the surface of a dune site near al-Hofūf in Saudi-Arabia (Sordinas 1973). This piece is also marked by large wings with a straight base and, according to Sordinas' description, by "excellent pressure retouch" (Sordinas 1978:17, fig. 9/22). Last, but not least, another similar find is reported by the same author as a part of the so-called "Zimerman collection" from the northern fringe of the Rubᶜ al-Khālī, situated slightly north of the Wādī al-Dawāsir, in the centre of the Peninsula (Sordinas 1978).

As a result, it is possible to identify a widespread distribution of single pieces of a very distinct arrowhead-type around the Rubᶜ al-Khālī. The single find ADA 1.28 marks the easternmost extension of the distribution of this type. Typological aspects of single tool types are frequently discussed as a possible hallmark to distinguish surface finds. Most recently, Spoor has discussed the geographical distribution of different types of projectile points (Spoor 1997). Although his ideas are worthy of discussion, there are a number of arguments against theories based upon the currently available typologies of Neolithic projectile points. Although a large number of lithic assemblages from the Arabian Peninsula are available, we still rely on only a few excavated and stratified sites to date single types.

The present author's own work on lithic assemblages from site H3 in northern Kuwait (Carter & Crawford 2001; Kallweit, in preparation) and from Dalma, an island off the coast of Abu Dhabi (Kallweit, in preparation), reveals a number of aspects of lithic typology and technology which the aforementioned coastal sites seem to share in common. These tentative results can again be compared with the results of A.H. Masry's work on coastal Neolithic sites of eastern Saudi Arabia (Masry 1974). All the sites mentioned are stratified with levels dating back to the second half of the sixth millennium BC (Masry 1974: 223). The lithic assemblages associated with these deposits are mostly comprised of perforating (Fig. 1/12–13) and easy cutting tools (Fig. 1/16–17), including a high percentage of wedge-like attrition-tools, manufactured almost exclusively from a locally available, mostly tabular, flint, of poor to medium quality. From Kuwait to the United Arab Emirates, the sources of this raw material are similar: flat ridges close to the present day coastline. The raw material is embedded in a brittle, weathered calciferous rock. These flint sources offered only a limited range of possibilities to the ancient craftsmen. Interestingly, the few arrowheads known from H3, Dalma and another specimen from Ain Qannas are made of this local material. The shape is mostly triangular with emphasized barbs and a stem (Fig. 1/14–15). In most cases, both faces are covered with retouch.

Another common tool-type consists of so-called "knives" made of the local tabular flint. These "knives" are laterally retouched, very often alternating and without a straight delineation (Fig. 2/4–5). Their classification as "knives" is therefore unsatisfactory. Moreover, the term is applied to a variety of items of different qualities of work. Larger pieces of this type could be classified as choppers, while others show signs of being unfinished and could be the initial stages of a larger projectile point. The more compact and homogenous local raw material, with only a few inclusions and gas blisters, allowed the manufacture of sophisticated tools (Kallweit & Hellyer 2003).

Another class of tool commonly present on the coastal sites consists of drills or piercing instruments. Real drills are mostly triangular in cross-section (Fig. 1/2, 12–13). Use-wear retouch on opposite faces, running in one direction like the marks of a turning wheel, is the typical effect of the tool's use. Piercing instruments are mostly formed in a rod-like fashion (Fig. 1/3–4) and the use-wear, if present, is different from that on typical drills. Traces of abrasion point in one direction, mostly from ventral to dorsal. This applies to both the left and right edge of the tool. Both the real drills and piercing instruments sometimes have an unretouched base, which served as a handle (Fig. 2/1–2, 5).

Other tool-types are present in varying quantities. Small, wedge-like instruments are quite numerous. Scrapers (Fig. 2/6–8), awls and burins are less common. Larger projectile points — mostly bifacial, lateral, or even covering retouched, with elongated or rounded shapes — and polished stone adzes add to the assemblages from coastal sites. In general, it is useful to compare the typology of these projectile points or adzes, but tool types such as drills or wedges are less informative in this respect. In any case, the raw material and the technique of manufacture appear to be fairly similar from Kuwait to the United Arab Emirates.

On the ADA sites, these features are only partially present. At ADA 2, where the raw material used was almost exclusively local, the assemblage looks like a typical "coastal" inventory, though polished adzes, the typically tanged and stemmed arrowheads, and larger projectile points are absent up till now.

It is not the aim of this paper to create or define a

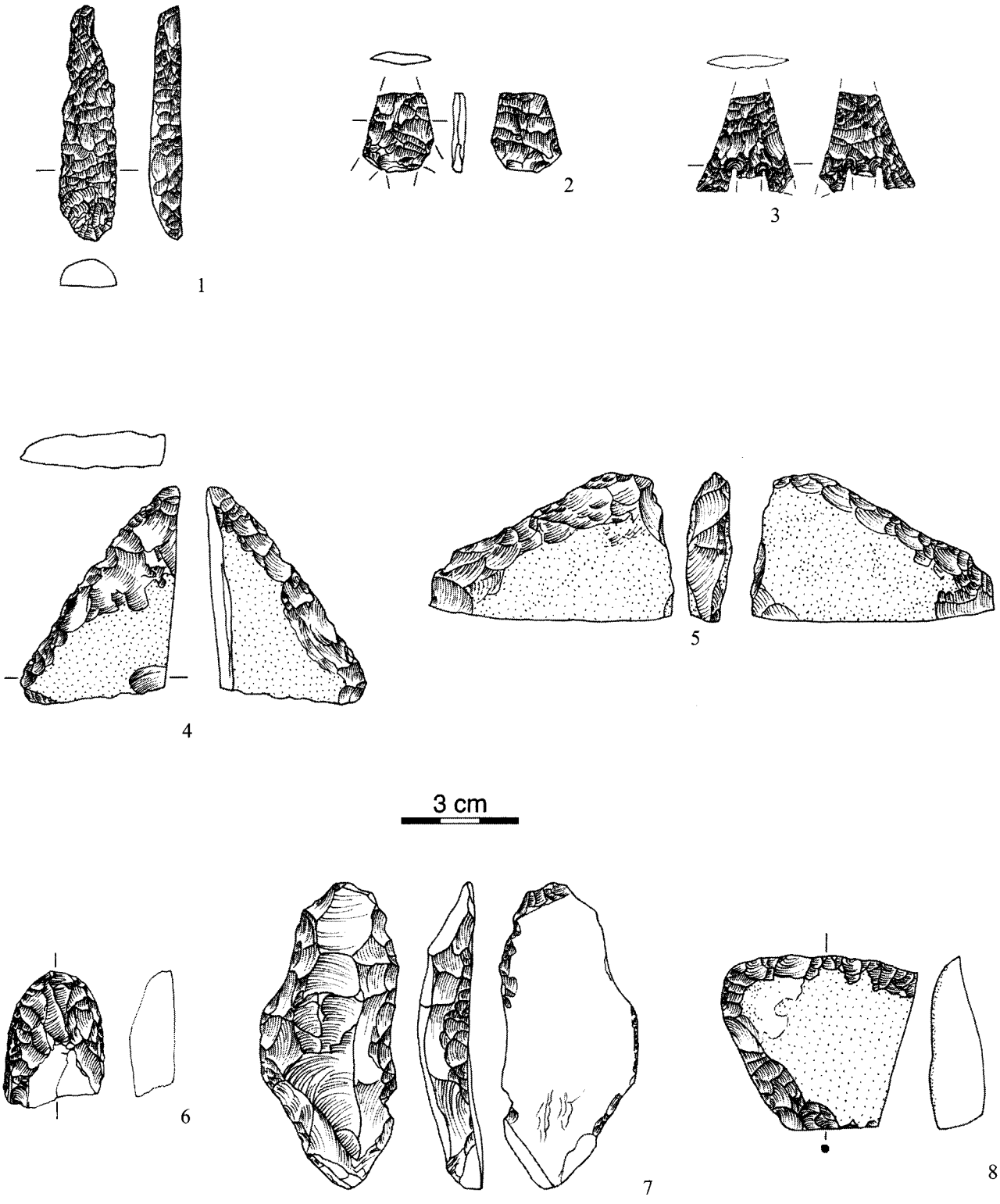

FIGURE 2. *Stone tools from the Abu Dhabi Airport sites.*

"coastal typology" distinguishable from an inland one. In the author's opinion, the similarities in lithic tool-types, their shape and frequency, as well as other common features such as the use of certain jewellery, are much more likely to reflect social and economic traits shared by a number of Neolithic groups, and I would consider their presence on the coastal sites as a reflection of the seasonality of a nomadic lifestyle (Kallweit 2003: 61–63). Beyond the keeping of sheep, goat and cattle, the bones of which are present at all excavated sites, a further link is the presence of ᶜUbaid potsherds. From Kuwait to Raʾs al-Khaimah, finds of ᶜUbaid pottery indicate the presence of trade, either with Mesopotamian populations or between local Neolithic groups. These local lithic assemblages appear to be almost identical, compared to contemporary Mesopotamian lithic technology, and this also applies to the ADA sites, apart from the few details briefly mentioned above.

Future research at the ADA sites might profitably concentrate on the complete excavation of the wells and further investigation of the main site, ADA 1. New finds from stratified contexts may clarify further our understanding of the site and its genesis through different periods.

Note

[1] See that paper for the acknowledgements. In addition, however, I would like to thank Mark Beech for kindly correcting the English of this paper.

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