

Table 1. Clinical signs of Envenomation by Saw-scaled Viper

| Signs and Conditions | Saw-Scaled viper <i>Echis carinatus</i> |
|-----------------------------|---|
| Swelling and oedema at site | +3 |
| Pain | +3 |
| Discoloration | +2 |
| Vesiculation | +2 |
| Ecchymosis | +2 |
| Prolonged clotting time | +3 |
| Haemorrhage | +3 |
| Hypotension | +2 |
| Nausea and/or vomiting | +1 |
| Necrosis | +1 |

Conclusion

It is believed that a **Saw-scaled Viper** *Echis carinatus* bit Josef. Most of the clinical signs mentioned in Table 1 were observed during Josef's illness (Fowler, 1992).

Reference

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A Late Stone Age Site south of the Liwa Oasis

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اكتشاف موقع أثري جنوب ليوا ويشمل آثار
 من أواخر العصر الحجري وأواخر العصر الإسلامي.

Introduction

An examination of an inter-dunal plain south of the arc of the Liwa Oasis, in southern Abu Dhabi, has yielded archaeological artefacts provisionally ascribed to two periods, the Late Islamic period and the Late Stone Age. The material from the latter includes worked flint typical of the Arabian Bifacial Tradition, which is, as far as is currently known, the first of its type to be identified south of the Liwa on the Abu Dhabi edge of the Empty Quarter. An abandoned well was also located at the site.

For over twenty years, albeit intermittently, I have searched for evidence of Late Stone Age ('Neolithic') activity in the United Arab Emirates. I was, therefore, delighted early in 1998 to identify clear signs of early hunting just south of the Liwa Oasis.

The site is, as far as I am aware, the first of its period yet to be found in the deep sands between Liwa and the international border with Saudi Arabia, although Late Stone Age sites have previously been identified in the Saudi Arabian portions of the Rub Al Khali (Empty Quarter) (1).

Late Stone Age artefacts have also been found in the Emirate of Abu Dhabi in the sands north of the Liwa, at Habshan, for example, (2), and more extensively, on the coast and islands (3).

Early in 1998, I visited Yaw Sahhab, a valley 9 km south-east of the settlement of Hameem, on the eastern end of the arc of the Liwa Oasis. The valley contains a plantation belonging to the Ruler's Representative in the Eastern Region of Abu Dhabi, the co-ordinates of which are 22 53 N 54 21 E. Approximately 500 m west of the plantation, on the floor of the valley, I noticed a small fragment of ostrich eggshell on the surface. The presence of ostrich eggshell is often an indication of previous human activity, sometimes, but by no means

always, dating to the Late Stone Age.

A detailed search of the surrounding area revealed the presence of one small flint arrowhead and a scattering of flint flakes, the first that I had ever seen in the Liwa area, as well as a number of pottery fragments spread over a restricted area roughly 100 metres in circumference.

During a number of subsequent visits to Yaw Sahhab, further more concentrated searches were made, leading to the discovery of many more fragments of pottery and tiny flint flakes.

A preliminary examination of some of the potsherds by the Abu Dhabi Islands Archaeological Survey, ADIAS, (4), suggested that all were Late Islamic in date, ranging from the 16th to 20th centuries. Some pieces were glazed, and were identified as being of the type known as Khunj/Bahla ware, which has been dated to the 16th-18th centuries (5). A few tiny pieces of glass, presumably also Islamic in date, were also found.

The flint flakes are small to minute in size, and almost all bear the marks of being struck by human agency. Some have a very clear percussion bulb and bulbal scars, effects caused by striking a larger piece of flint while tool-making. Almost all of these pieces are debitage, i.e. pieces discarded while a tool, such as an arrowhead (projectile point) or a scraper, is being made.

One or two pieces, however, seem to be small cores, i.e. lumps of flint from which flakes have been struck off, either to make bladelets or as part of a fire-lighting kit. Three small flakes bear the marks of having been re-touched, i.e. flaked so as to produce minute scrapers. These three flakes are, respectively, 20 mm, 17 mm and 16 mm long, and each is around 11 mm wide.

The single arrowhead found is finely worked, although one of the barbs is broken off. 19 mm long by 15 mm across, it

appears typical of tools from what is known as the Arabian Bifacial Tradition, dating to the Late Stone Age.

It is difficult to make a definitive judgement from a single, damaged, specimen, but the piece appears to bear some resemblance to Type 3 of a collection made at Nadqan, in eastern Saudi Arabia, several hundred kilometres west of the Liwa, and published several years ago (6).

No flint occurs naturally in the Liwa Oasis or in the surrounding sands, and the material used to produce the flakes and tools must, therefore, have been imported to Yaw Sahhab, presumably by human agency. Four clear types are distinguishable by colour.

There are a very few pale grey flakes that, on the basis of my own observations, appear to be not unlike some of the tabular flint to be found commonly along parts of the coastline of the Emirate of Abu Dhabi and on some of the adjacent offshore islands. They are, however, paler and of a more consistent colour than the often flecked tabular flint.

There are also a small number of very light brown, almost cream coloured, flakes, some of which are semi-transparent. Another form, much more common, is of brownish grey stones, some of which are irregular in colour, but not dissimilar to the caramel-coloured flint commonly found in the mountains near Al Ain, in particular in and around Jebel Huwayyah, 'Fossil Valley,' a site well known for evidence of Late Stone Age activity (7). Finally, and also very common, there are dark chocolate brown pieces in a variety of sizes, which seem similar in consistency to the caramel-coloured flint mentioned above. Although no source for flint of this colour is known to me, it may be reasonable to postulate, in advance of further study, that much of it may have originated in the Hajar Mountains of either Oman or the United Arab Emirates. The nearest plentiful source for flint nodules (as opposed to tabular flint, generally of lower quality for tool-making), is in the Hajar a little more than 200 km to the east of Yaw Sahhab.

As an amateur, but enthusiastic observer, I was immediately struck by the smallness of the flakes that were used as tools. There is, however, extensive evidence from elsewhere that Late Stone Age man made use of tiny blades for tasks like cutting notches in a bow for bowstrings, preparing arrow shafts and making slits into which the tangs of arrowheads could be fitted. It is reasonable to suggest that the flint flakes and small tools found at the Yaw Sahhab site are simply the remnants of what once might have been present.

Moreover, if, as the presence of Late Islamic potsherds on the site might suggest, Yaw Sahhab has been visited by man, perhaps intermittently, over a period of many thousands of years since the Late Stone Age, other usable flints on the surface are likely to have been examined in the past by users of flint who would have carried away everything of potential use for re-working. When, as in this case, there is no local supply, every flake is potentially a new tool in the right hands. The presence of flint projectile points in ethnographic displays at Al Ain Museum suggests that the use of flint continued in the Emirates until relatively recently (8).

Graphic confirmation of the ability of Late Stone Age Man to use such tiny tools has recently been found, which confirms results from detailed analysis carried out by lithics experts.

In September 1991, the frozen body of a man was

recovered from melting snow on the Hauslabjoch on the border between Austria and Italy. Exhaustive studies have conclusively dated the body to around 3,200 BC, or to the latter part of the Late Stone Age in Europe. Among items found in the well-preserved belt-pouch of the body was a small sharp flint flake, of dimensions 17 mm by 12 mm by 2 mm thick, comparable to the tiny flakes from Yaw Sahhab (9).

A detailed analysis of the tool kit carried by the 'Ice Man' of Hauslabjoch showed that he carried only small amounts of flint, including a scraper and knife-blanks which could be fashioned into arrowheads, as well as bladelets for a wide range of cutting tasks. The hunter also carried a pointed tool with which to re-touch his flint tools and, where necessary, to make fresh arrowheads. In a European context, such a tool would have usually been made of antler, bone or hardwood. No equivalent material has yet been identified for such tools in the context of the United Arab Emirates, although it has been suggested that the tusks of male dugongs might have been suitable (10).

The 'Ice Man' carried little with him, and it is reasonable to suggest that Late Stone Age man, moving in hunting parties around the Emirates, then less arid than they are today, after game like ostrich, gazelle and hare, would also have carried only the essential.

The collection of artefacts found at Yaw Sahhab spans a period that apparently stretches from the local Late Stone Age (5th - 4th Millennium BC) to the Late Islamic period. Although subjects such as the impact of climate change over that period and any shift in human settlement patterns to involve a greater or lesser degree of nomadism are, as yet, not fully understood, it seems unlikely that the site was used only at the beginning and the end of this six or seven thousand year period, even though no artefacts from intervening periods have yet been identified. This may, of course, be due, in part, simply to a failure to recognise ceramic or other material from other periods.

An extensive search of the rest of the Yaw Sahhab valley produced only one further piece of ostrich eggshell, with one more fragment in the next valley to the west. All the remainder of the material identified, whether pottery or flint flakes and tools, was found in the previously mentioned area of roughly 100 metres circumference.

This suggested that there might have been a particular reason for the concentration, and during a further visit in April 1998, I recognised on the site a surface feature which I had previously overlooked. The feature was situated on the floor of the valley around 40m from the base of the adjacent dune. It consisted of a slightly raised ring of hardened sand, around 20cm high and 4m across, within the middle of which, with a diameter of no more than 1 metre, was a shallow roughly circular depression. I identified the feature as being the remains of a dry fresh water well.

Anecdotal evidence from older residents of Liwa refers to the presence of fresh or brackish water wells at the base of the dunes in the area. These are, in some circumstances, evidently of some age. There is, for example, reference in Lorimer's *Gazetteer*, published in 1908, to the presence of wells in Liwa at settlements named as Hamaim, Qa'aisah and Jarrah (11). Water was available at a depth of only a few metres in the period

immediately prior to the recent oil-driven development of the area, and it is reasonable to assume that it was also available earlier, back to and including the period of the post-glacial 'climatic optimum' that coincided with the Late Stone Age in the Emirates.

At a depth of 2-4m or less, the indurated sand would easily have supported the walls of a well, there being no stone available locally for reinforcing deeper constructions. It is also likely that any well would have frequently been cleaned out by travellers, which would provide a possible explanation for the wider ring of slightly raised and hardened sand around the well site. Such a practice was certainly adopted at another desert well in Abu Dhabi, that of Tawi Beduwa Shwaiba, into recent times (12).

Organic detritus left at the Yaw Sahhab site by travellers, such as broken arrow-shafts or leather containers would have decayed over time, while wooden and bone tools would have been eaten, carried away or have decomposed, leaving only the more indestructible items like pottery, flint and glass. Metal items that had been abandoned on the surface might, similarly, either have disintegrated or have been carried away. Certainly there was no evidence of any such items on the surface.

Evidence from elsewhere has shown that flint continued to be used as a convenient cheap tool for fire-lighting and other tasks long after metal alternatives were available, and the same is likely to be the case in the United Arab Emirates. A struck flint core, possibly used for fire-lighting, has, for example, been found on the surface of a Late Islamic settlement site on Abu Dhabi's offshore island of Balghelam (13).

Further study of the pottery from the Yaw Sahhab site, and a refinement of dating, is required. It is, however, perfectly feasible, given the presence of a well, that the site was continuously, if irregularly, used over the entire period since the Late Stone Age until relatively recently. Enquiries of local Bedu may help to elucidate this point.

The Yaw Sahhab well site may have been one of a series on a route running across the southern Liwa region, and there is, indeed, still a rough vehicle track running past the site, which continues through a chain of similar valleys extending to the west for a distance of at least thirty kilometres. The well itself may have been abandoned for a variety of reasons, including increasing salinity, a fall in the water table or the identification of better wells further north.

Little has thus far been published about the archaeology and history of the Liwa region, although the Bani Yas tribal confederation are first reliably reported in the general area in the early 17th Century AD (14), a date which is consistent with the presence of sherds of 'Khunj/Bahla' ware on the Yaw Sahhab site. New routes leading through the palm gardens in the Liwa to the north may have meant that routes further south fell into disuse, although hunting parties would still have ventured out into the sands to the south and into the Empty Quarter in what is now Saudi Arabia, where, as mentioned earlier, there is plentiful evidence of hunting during the Late Stone Age.

It is, finally, worth noting that the floor of the Yaw Sahhab valley is clearly a palaeo-floor, which has been continuously deflated over the years. Mobile sand has been blown across the floor, leaving the flints and

pottery on the original land surface, which predates the formation of the great dune fields. This may suggest that the major dunes in this north-eastern edge of the Rub Al Khali may have moved only by a small amount over the course of the last few thousand years.

If this is, indeed, so, there may well be other archaeological sites similar to Yaw Sahhab in the open desert south of Liwa. Apart from a whitish colour and plentiful vegetation, mainly salt-bushes, (especially *Zygophyllum* sp.), the valley floor is otherwise indistinguishable from other inter-dunal valleys in the region. Several such valleys have been examined, but without any archaeological artefacts being found. It is possible, however, that investigation of a route leading westwards beyond Yaw Sahhab and on into the Empty Quarter may identify more ancient wells and archaeological sites.

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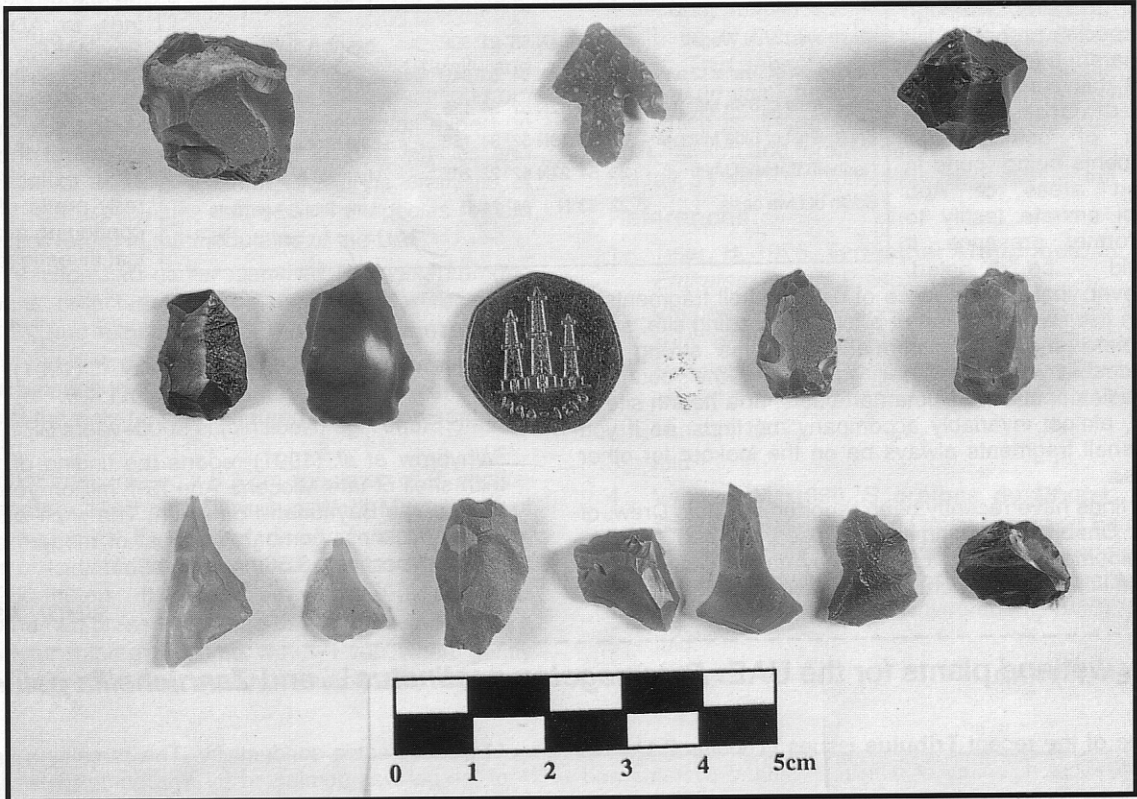
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Late Stone Age flints: arrowhead (centre top), scrapers and flakes from south of the Liwa oasis. Syrian Ostrich eggshell fragments from the Abu Dhabi desert. Photo: S.A.

