Is the Neolithic in Oman set in stone? What the lithic assemblage from Site 79 can tell us about the Neolithic period of northern Oman

Oever, Lois van den

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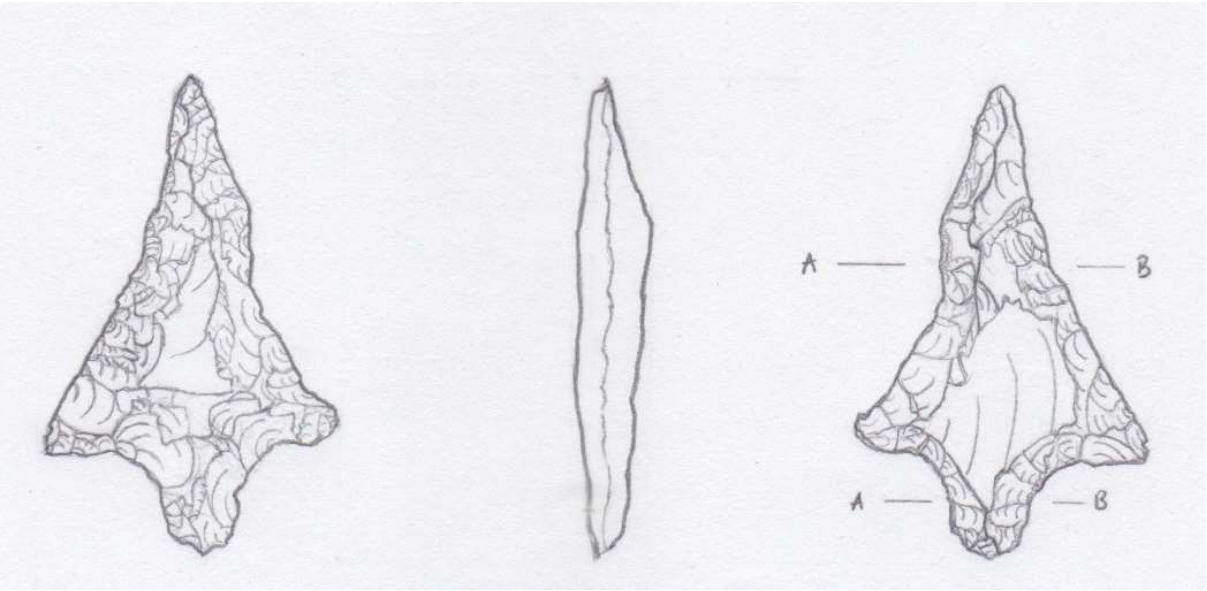

Lois van den Oever

Source cover image: Arrowhead L1_F54 from Site 79 drawn by Floriske Meindertsma during the 2018 season of WAJAP in Oman.

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Thesis BA3 / 1083VBTHEY

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1. Introduction

The subject of this thesis is Site 79, a Neolithic site located in northern Oman in the Sohar region. The focus is on the lithic assemblage collected from this site. The temporal distribution of the finds from this site makes it a fascinating study of the Neolithic period in the Arabian Peninsula. Survey work in 2018 recovered a lot of arrowheads, other lithic tools, and chips. Arrowheads corresponding to different periods being found in one location raises questions as to what kind of activities took place at this site and what that means for our knowledge about the Neolithic period.

The Neolithic period in Oman was a dynamic period where boundaries were not always clear-cut. Due to the unique Neolithic 'toolkit' present in Oman the discussion around the beginning of the period and its exact characteristics are still debated.

This thesis will try to categorize all the arrowheads found at Site 79 and discuss whether or not bigger questions about the Neolithic period can be answered using this material.

1.1. Aims and research questions

The research problem is that during the Neolithic period northern Oman suddenly seems almost empty. While during the Palaeolithic, northern Oman had been a quite densely populated hotspot. Knowing this, Site 79 is particularly important because it is one of a limited number of Neolithic sites which have been discovered. The arrowheads and other lithic material found here open up questions about the dating and interpretation of this Neolithic site. Knowledge about this site is useful for the interpretation of the Neolithic period in northern Oman. Therefore, the aim of my research will be to create more clarity in the dating and interpretation of the material of Site 79, in turn helping to solve the question of the 'empty' Neolithic.

The main research question is as follows:

What can the finds of Site 79 tell us and what knowledge does the site add to our understanding of the Neolithic period in the Batinah province of northern Oman?

This main question is answered through answering these subquestions:

I. *Which type of arrowheads and other chipped stones were found at Site 79 and in what stage of production are they?*
II. *To which time period do the arrowheads and other tools found at Site 79 date and what chronology does this create?*
III. *What type of site was Site 79?*
IV. *What is the reason for the large number of arrowheads left at Site 79?*

1.2. Dataset and methodology

To answer these aforementioned questions, this research is based on survey data from the Wadi al Jizzi Archaeological Project (WAJAP) and older surveys and excavations from the area. What the excavations and projects exactly entailed will be explained in chapter 2. Primarily the pictures and drawings of the finds from Site 79 produced during the WAJAP 2018 season are an important source. This data was collected and produced in January of 2018. These drawings and pictures will be compared to the available literature to see if a precise time period can be assigned to the site according to the features of the lithic material. The arrowheads play a central role due to their morphological variability throughout time.

A large part of the thesis will be based on a literature overview and discussion. The literature on the subject of Neolithic arrowheads in Arabia is not very substantial but there are some sources available. For example, Vincent Charpentier has written extensively on the subject. His research will be supplemented with other research on the area.

Additionally, a part of this thesis will be based on first-hand research of the drawings and pictures of the lithic material. The morphology of the arrowheads will be studied in order to determine which time period they stem from.

1.3. Structure of thesis

In this thesis I will first discuss what we already know about the Neolithic period in Arabia in chapter 2. This starts with a theoretical background and discussion about whether the term 'Neolithic' can be applied to the Arabian past. Then the past and present climate and environment of Oman will be described. After that, the history around the categorization of Neolithic arrowheads will be

discussed, including discussing material from surrounding regions that may be useful to the identification of material from Site 79. Following that, the site itself and its history will be explained. In chapter 3 I will evaluate the arrowheads from Site 79 and compare them to the literature. After that, my discussion of the results will take place in chapter 4. Lastly, chapter 5 will present a conclusion.

2. Background

Introduction

This chapter will give all the necessary background information about Oman and its environmental and human past. I will discuss what the term 'Neolithic' entails when applied to Oman. The proposed categorization of the arrowheads will be explained after that. In this chapter we will focus specifically on arrowheads since they can give us the most information to answer the research questions. These artefacts are being studied in various parts of Arabia and different categorizations of these arrowheads exist. These different categorizations will be discussed here and I will expand on which approach has the most potential to provide clarity on the research questions. When discussing the arrowheads, first we will start with some terminology, followed by the basic classification, after that we will look at the more detailed categories proposed by Charpentier. Some useful articles written after Charpentiers classification will then be treated.

The second part of this chapter will have to do with the site where our material comes from. The past excavation that took place and the more recent survey will be discussed. The Neolithic finds collected during the old excavation will be included in this. Finally, a conclusion of the chapter will be given.

2.1. The Neolithic Framework in Oman

The chronology of prehistorical Oman is be relevant starts around 8000 BCE when the Palaeolithic ends and the Neolithic begins. The beginning of the Neolithic roughly coincides with the start of the Holocene so these two terms will both be used. The Neolithic can be divided into an Early, Middle, and Late Neolithic. A more detailed chronology will be revealed during the discussion of the lithic material from Oman since chronology is based on the changes in material culture.

The process of neolithization has different characteristics around the world. So too does the process look different across West Asia. The Arabian Peninsula displays plenty of internal variation, so sweeping generalizations are difficult to make. Besides that, the boundaries between hunter-gatherers and fully Neolithic communities can be hard to recognize in archaeological assemblages, especially in Oman where organic material is not often preserved.

The Neolithic period in Oman is unique partly due to the fact that sedentism as it developed in other places where neolithization occurred was not really an option here. So some of the basic hallmarks that we usually recognize as being Neolithic are not present.

The term 'Neolithic' was originally defined in Europe and the 'Neolithic package' that became a concept clearly does not neatly apply to groups living on the Arabian Peninsula during the Early or Middle Holocene period (Crassard & Drechsler, 2013, p. 4).

Specific examples of the unique workings of the Neolithic period in Oman will be discussed in the climate, environment and human interaction subchapter.

Local or Levantine?

A specific contentious issue surrounding the neolithization of Oman is the question where the domesticated animals originated. Arguments are brought forth to defend local emergence while others suggest a Levantine origin of the domesticated animals. The same issue of local invention or Levantine origin plays out in the case of projectile point technology.

In the case of projectile points Charpentier and Crassard argue for a local origin of specifically the Fasad technology instead of a link to the Levantine Pre-Pottery Neolithic B period. They mention how it seems accepted by most that the Qatar-B lithic industry is identical to typical PPNB points and thus by extension that the whole Arabian Peninsula is an outgrowth of PPNB (Charpentier & Crassard, 2013, p. 34). Charpentier and Crassard disagree and base their arguments on morphological differences and differences in variability. The arrow points are also created by using different production techniques according to them (Charpentier & Crassard, 2013, pp. 34-35).

In the case of the domesticated animals, it seems to be a bit more difficult to clearly describe local invention or a Levantine origin. Many scholars argue quite convincingly for a Levantine origin. With arguments like the fact that sites in southern Arabia fall beyond the natural habitat of the wild ancestors of the domesticated animals (Crassard & Drechsler, 2013, p. 4).

As has become clear, the topic of the Neolithic in Arabia and especially Oman can be difficult to navigate. The neolithization of Arabia was likely a complicated mix of local development and external influences.

2.2. Climate, environment and human interaction

Climate

The climate as we know it in Arabia is hot and dry. However, this has not always been the case. The climate in Oman has been influenced by the Indian Ocean monsoon system for a long time. The intensity of its influence has varied throughout the various glacial-interglacial cycles (Burns et al., 1998, p. 499). During the Last Glacial Maximum (LGM) there was minimum rainfall, hence the central part of the Arabian Peninsula, Oman, must have been very dry during this period. After the LGM the temperatures rose and precipitation increased (Uerpmann & Uerpmann, 1991, p. 255).

This increase in precipitation most likely occurred because of increased monsoon intensity during a period between approximately 8000 and 4000 BCE which has been termed the Holocene moist phase (Burns et al., 1998, p. 501). The global effect of the change from a glacial maximum to a warmer climate likely also contributed to this moistness. Studies about the climate during the Early Holocene agree that the region was wetter back then compared to now. This moist phase meant that Arabia was easier to live in than the arid conditions that came afterwards.

The Holocene moist phase meant that the climate was also more hospitable to livestock during this period. Furthermore, the coastline was very different during this time because the sea level was higher due to the melting of glaciers since the Last Glacial Maximum.

After the Holocene moist phase the climate proxies show an abrupt change back to much more arid conditions at around 4200 BCE. After the climate turns to arid conditions the inland becomes very dry and harder to live in.

Landscape

Due to these climatic shifts the landscape also changed throughout time, which influenced where and how people lived. The change in the location of the coastline also has implications for current archaeological investigations into the Neolithic period in Oman. The site that will be discussed further later on for example was located much closer to the coastline in the past compared to now. This makes it difficult for archaeologists to find these sites because they are now located in less predictable locations. This difficulty in locating Neolithic sites is one of the reasons why the Neolithic in Oman and in particularly in northern Oman is not very well known.

Vegetation

During the Holocene moist phase the vegetation in Oman could thrive. Due to the presence of the monsoons there was plenty of rain, with occasional summer rains beside the more common winter

rains. This produced better and more vegetation like grasses and trees which in turn could support more animals and humans (Cleuziou & Tosi, 2007, p. 49).

Since the Holocene moist phase ended and more arid conditions started, the vegetation in Oman nowadays is mainly of the semi-desert type. Some desert areas are present with their own vegetation like woody branched bushes, for example *Calligonum crinitum*, which do not need a lot of water. The north of the country is even drier than the south, the amount of rainfall is lower and precipitation here mainly occurs in the winter. The fact that the south of the country is wetter is because the monsoon rain comes from the south and often does not reach the northern part of the country. Small dry-resistant trees with extensive root systems, like *Prosopis cineraria* are still able to grow and thrive here (Lézine et al., 2002, p. 222).

Animals

Increased rainfall in the Holocene moist phase created an environment where wild animals could thrive. Sadly the preservation of vertebrate bones is usually poor in Oman, possibly due to low sedimentation. This means the bones would be destroyed by weathering before they were buried by new layers (Uerpmann & Uerpmann, 1991, p. 163). This lack of organic material at most archaeological sites means it can be difficult to reconstruct subsistence practices. However, plenty of shell-midden sites have been found and show that along the coasts molluscs played a significant role in the diet of humans (Uerpmann, 1992, p. 101).

Due to the increased rainfalls during the Early Holocene the now newly available grasslands would be useful for pastoralism (Magee, 2014, p. 49). So, the increased rainfall likely influenced the spread of pastoralism and domesticated animals throughout the region. The development of nomadic herding was a change to a subsistence strategy that became widespread throughout Arabia (Magee, 2014, p. 48). This extensive pastoralism is one of the Neolithic developments in Oman.

As mentioned before, there is a discussion surrounding the origin of domesticated animals in Arabia. It is likely that domestic animals found at sites in Oman originally came here from the Levant. Domesticated cattle, sheep and goat were an important part of the subsistence strategy of groups of people on the Arabian Peninsula during the sixth to the fourth millennia BCE (Crassard & Drechsler, 2013, p. 4).

So, when looking at the Neolithic period in Oman livestock farming developed fairly early, around 5500 BCE, while local pottery production only developed around the third millennium BCE (Méry & Charpentier, 2013, p. 73). This is an example of the way the Neolithic package looks different in Oman compared to other places.

The Neolithic site 18 of Jebel al-Buhais gives a local example of which animals could be part of the average Neolithic survival package. Local fauna remains that were found included the wild donkey, wild camel, Arabian oryx, gazelle, and the wild goat (Uerpmann et al., 2000, p. 230). A large part of those animals are considered to have been domestic livestock.

After the Holocene moist phase ends more people are found at the coasts, since the exploitation of marine resources stays more stable than the availability of interior resources.

Nowadays we can reconstruct how the human populations reacted to all the fluctuations in climatic and environmental conditions. Depending on the location and the season, a mixture of hunting, herding, plant gathering and marine resources contributed to peoples' subsistence. Because of the climatic fluctuations and eventual extreme dryness of the climate sedentism was not something that took hold as part of the Neolithic toolkit.

2.3. The Oman Neolithic archaeological record

2.3.1. Lithic material

Terminology

A ***blank*** is the piece of material that someone selects to process into a tool. Before it has been retouched it is called an ***unworked blank***. A blank has to be the correct size in order to be useful to the knapper, so blanks are selected for characteristics that will help the knapper to get the right results (Whittaker, 1994, p. 153).

Retouching can mean any later modifications that are made on a flake once it has been removed from the core. However, it usually specifically means the removal of small flakes from the edges and faces of the flake. Retouch can be ***unifacial***, meaning on one face or surface of a tool, or ***bifacial***, meaning on both faces of a tool (Whittaker, 1994, p. 19). Retouch can also be direct, inverse, or alternate. ***Direct*** retouch is retouch originating from the ventral face of a flake or blade (Inizan et al., 1999, p. 140). ***Inverse*** retouch is retouch originating from the dorsal face of a flake or blade (Inizan et al., 1999, p. 144). ***Alternate*** retouch refers to removals from a face along one edge in addition to removals from the opposite face along the other edge (Inizan et al., 1999, p. 129).

Abrupt or ***semi-abrupt*** retouch refer to the angle of retouch formed by the removed flakes in relation to the face they come from. Abrupt is an approximate 90^{o} angle, semi-abrupt a 45^{o} angle (Inizan et al., 1999, p. 129).

The retouch removal at the sides of a flake can have a particular morphology as well. Sometimes the retouch is ordered, meaning it is done in a pattern. ***Transverse parallel*** or ***oblique parallel*** for example (Inizan et al., 1999, p. 146).

A ***tang*** is a projection from the body of the arrow opposite the point, often outlined by two flanking notches or shoulders. A tanged arrowhead is simply an arrowhead with a tang (Inizan et al., 1999, p. 156). This tang was used to attach the arrowpoint to a shaft to form a functional arrow.

A ***bifacial point*** has two faces, a ***trifacial point*** has three.

A point with a ***fusiform*** shape means that the point is wide in the middle and tapered at the ends.

A ***foliate*** point is a term for points shaped in a particular way, the name means leaf-shaped.

2.3.2. Old classifications

If we intend to get a grip on the chronology of Site 79 it is useful to look at how lithic material has been classified and used to create chronologies in the past. Because the archaeology of the Neolithic of Oman is not an exhaustively studied field yet there does not exist a definitive classification system. The earlier discussed problem of how the Neolithic came to be in Oman complicates this as well. As we have seen some people see the lithic industries of Oman as a simple extension of what was already present on the rest of the Arabian Peninsula while others argue for a unique and internal emergence of lithic industries.

The Arabian Bifacial Tradition (ABT)

In the past, lithic industries in Oman were connected to the larger concept of the Arabian Bifacial Tradition (ABT). This term was used for bifacial foliate points found at sites all over the Arabian Peninsula. It was applied to a broad variety of lithic material but originally created by C. Edens based on complexes of the 'Rub al-Khali Neolithic' with barbed and tanged arrowheads (Uerpmann, 1992, p. 88). These arrowheads are not universal in Oman so other bifacially retouched points were often used as an indicator of the presence of the ABT in Oman. Overall the ABT was seen as a very varied lithic tradition. The ABT was placed by Edens between 6000 BCE and 3000/2000 BCE.

Margarethe Uerpmann saw the Saruq-facies as a local variant of the ABT. This variant appeared after the second quarter of the Holocene. First the people living on the coast of the Gulf of Oman had what is called by Uerpmann the Wadi-Wutayya-Facies, and after that the ABT spreads into the coastal part of the Oman Peninsula where it becomes the local version identified as the Saruq-Facies (Uerpmann, 1992, p. 105).

Saruq-facies were seen as a lithic facies by Margarethe Uerpmann and others. Later this group would be split up by Vincent Charpentier into the Habarut facies and Suwayh facies.

Rémy Crassard and Philipp Drechsler criticize the use of the term ABT. They argue that the lithic facies associated with the ABT have only been poorly radiometrically dated and that it is not justifiable to group multiple facies into a universal period dating. Another point that they make it that the ABT is not typologically clear because it includes too many types and materials (Crassard & Drechsler, 2013, p. 5). They advocate for the use of concepts like ‘cultures’ and ‘traditions’ instead of typologically oriented terms.

2.3.3. Classification according to Vincent Charpentier

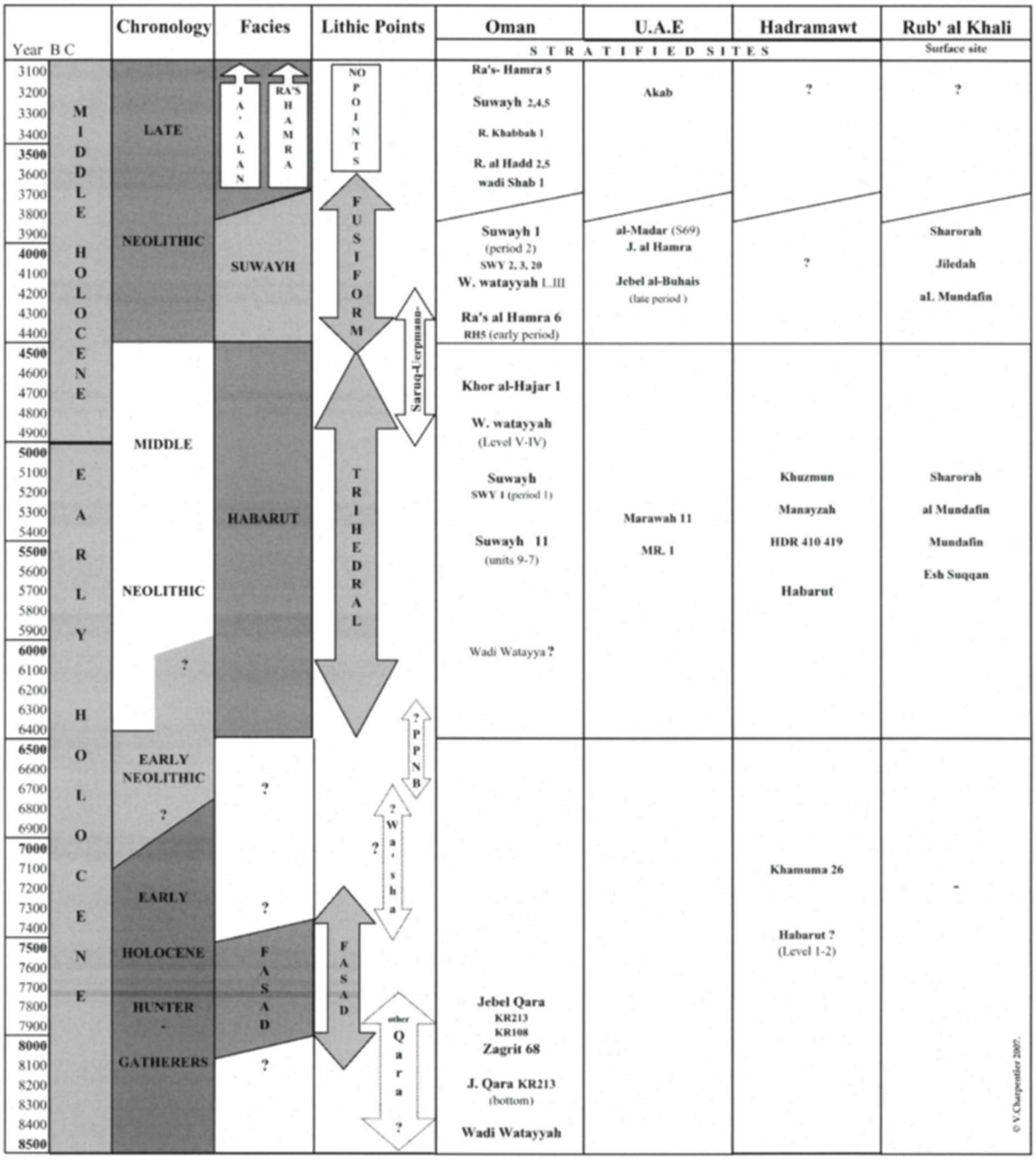

Figure 2.1 Charpentiers chronology of Late Prehistoric facies in Oman (Charpentier, 2008, p. 108).

In his 2008 paper Vincent Charpentier presented his categorization of Neolithic lithic assemblages from Oman. These span from the Early Neolithic or just before it to the Late Neolithic period. Figure 2.1. shows a visual summary of the facies and the way Charpentier orders them. The time period discussed here spans from around 8000 to 3700 BCE. At the end of the Neolithic in Oman the lithic facies become far more regional, that means two lithic assemblages from the same time period can look extremely different from one another. Our discussion here will concern three lithic facies. Fasad are the oldest, then Habarut which are trihedral arrowheads and finally the Suwayh facies, which

includes fusiform arrowheads. Here I will explain Charpentiers criteria and go deeper into every type of lithic point he describes.

2.3.3.1. Fasad

Fasad refers both to an entire lithic industry and to specific points with the same name. The period this lithic industry has been dated to is the Early Neolithic, around 8000-7500 BCE. The chronology of the Fasad lithic facies was difficult to establish. There was a complete lack of stratified sites from this period for a long time. The dating we have now, the first half of the eight millennium, is based on radiocarbon dated material from two rock shelters of Jebel Qara in the Dhofar province, KR108 and KR213 (Charpentier, 2008, p. 97). If we take it slightly broader and look at other dated sites with Fasad points the maximum range is between the ninth and seventh millennium BCE (Charpentier & Crassard, 2013, p. 30).

Points

In the usual definition of the Fasad points, the projectile point has to be a pointed flake or blade with a tang, the tang having been shaped by some kind of retouch (Charpentier & Crassard, 2013, p. 28). Retouch may be present at one or two edges but usually the only retouched part is the tang. The components of the lithic assemblage that are specific to this time period include projectile points made on blanks of flakes that are usually thin (Charpentier, 2008, p. 95). The tang of the Fasad point is typically created through bifacial retouch. The distal part of the point, the tip, is normally sharp and not retouched, only sometimes having been reworked by some marginal retouching. The body of the point is only very rarely retouched.

The Fasad points have been found at multiple sites. One of the most important assemblages found is that from the site of Al-Haddah BJD-1 which included more than sixty points. This collection was made from a variety of materials and the blanks had different forms (Charpentier, 2008, p. 95).

Three types

Charpentier and Crassard have identified three types in the projectile points usually called Fasad points. They argue that archaeologists only base their interpretation on typology in respect to Fasad points. They posit that looking at the technological component of the points reveals a differentiation between three types (Charpentier & Crassard, 2013, p. 30). Looking at the technological component of the points means looking at for example the scar patterns on the dorsal side of blades and flakes. These types of traces can help to identify how the blanks were obtained (Charpentier & Crassard, 2013, p. 34).

The first type they called the Fasad point *sensu stricto*. Examples of this type are shown in Figure 2.2. The Fasad point *sensu stricto* is a laminar blank or a long flake with a retouched tang. Usually, the

blank is long and thin with irregular edges. It could also be a thicker flake with a natural point. The tang of the point is clearly visible and well-shaped. The tang can have been created by direct retouch but also possibly by either inverse, alternate or bifacial retouch (Charpentier & Crassard, 2013, p. 31). In Oman, this type of Fasad point is quite widespread. They have been found in the Dhofar region, along the southern and north-eastern coasts and other regions in the south of the country.

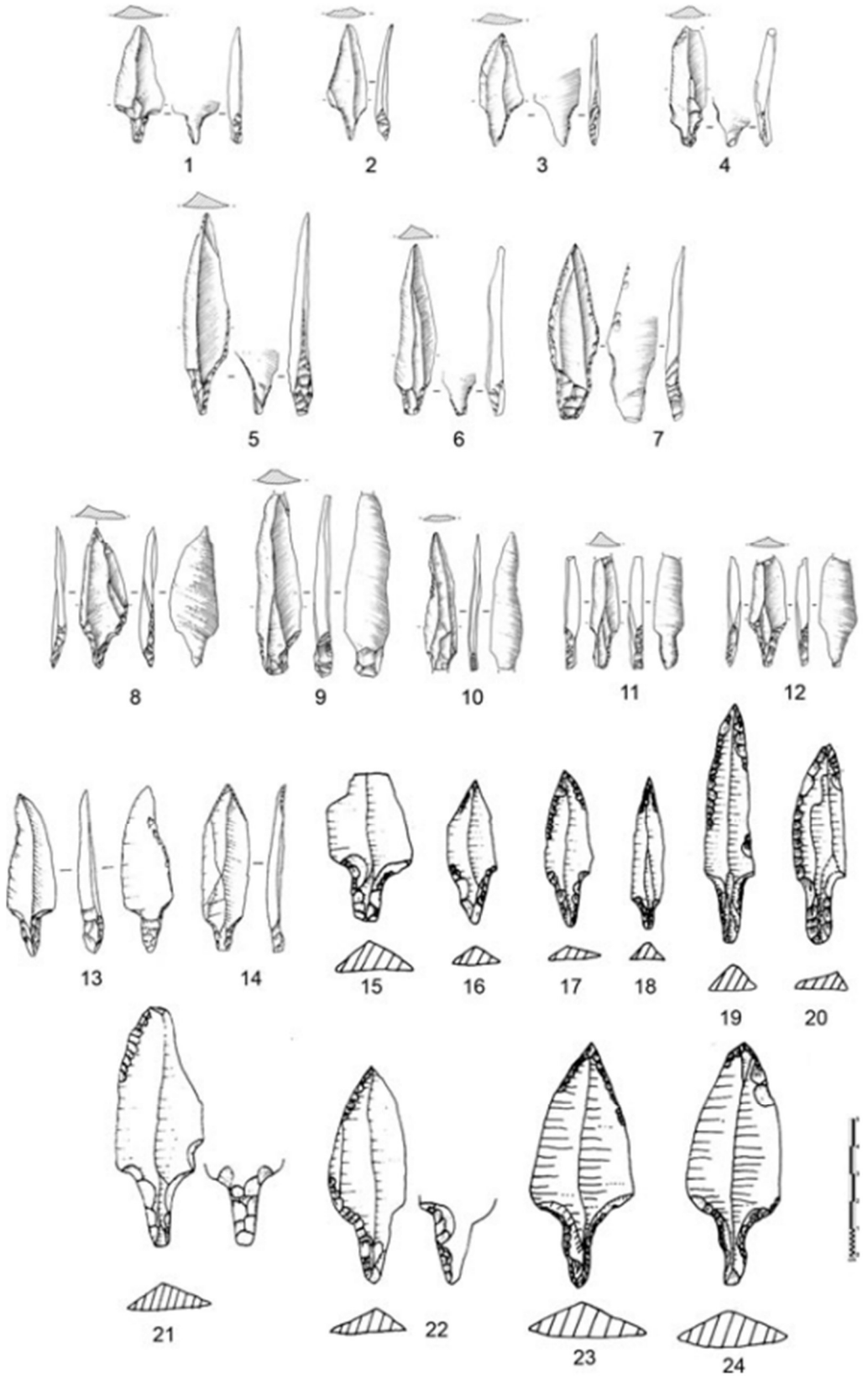

Figure 2.2 Fasad points sensu stricto*. 1-7 from Ramlat Fasad, drawn by G. Devilder; 8-12 from Ramlat Fasad/al-Hashman, drawn by G. Devilder; 13-14 from Jabal al-Qara (Cremaschi & Negrino, 2002, p. 355); 15-24 from Dhofari sites (Zarins 2001, as cited in Charpentier & Crassard, 2013). The scale bar is 5 centimetres. (Charpentier & Crassard, 2013, p. 32).*

The second type of Fasad points identified are called the Fasad points of the Faya tradition. Examples of this type are shown in Figure 2.3. These points are made on short and thin blanks with regular edges. The tang is visible but can also be an extension of the lateral edges of the point. This means the tang can look less well-defined than Fasad points from the *sensu stricto* type. Retouch is present only on the tang (Charpentier & Crassard, 2013, p. 31). This type is predominantly known from the north of the country. They get their name from the Jebel Faya site.

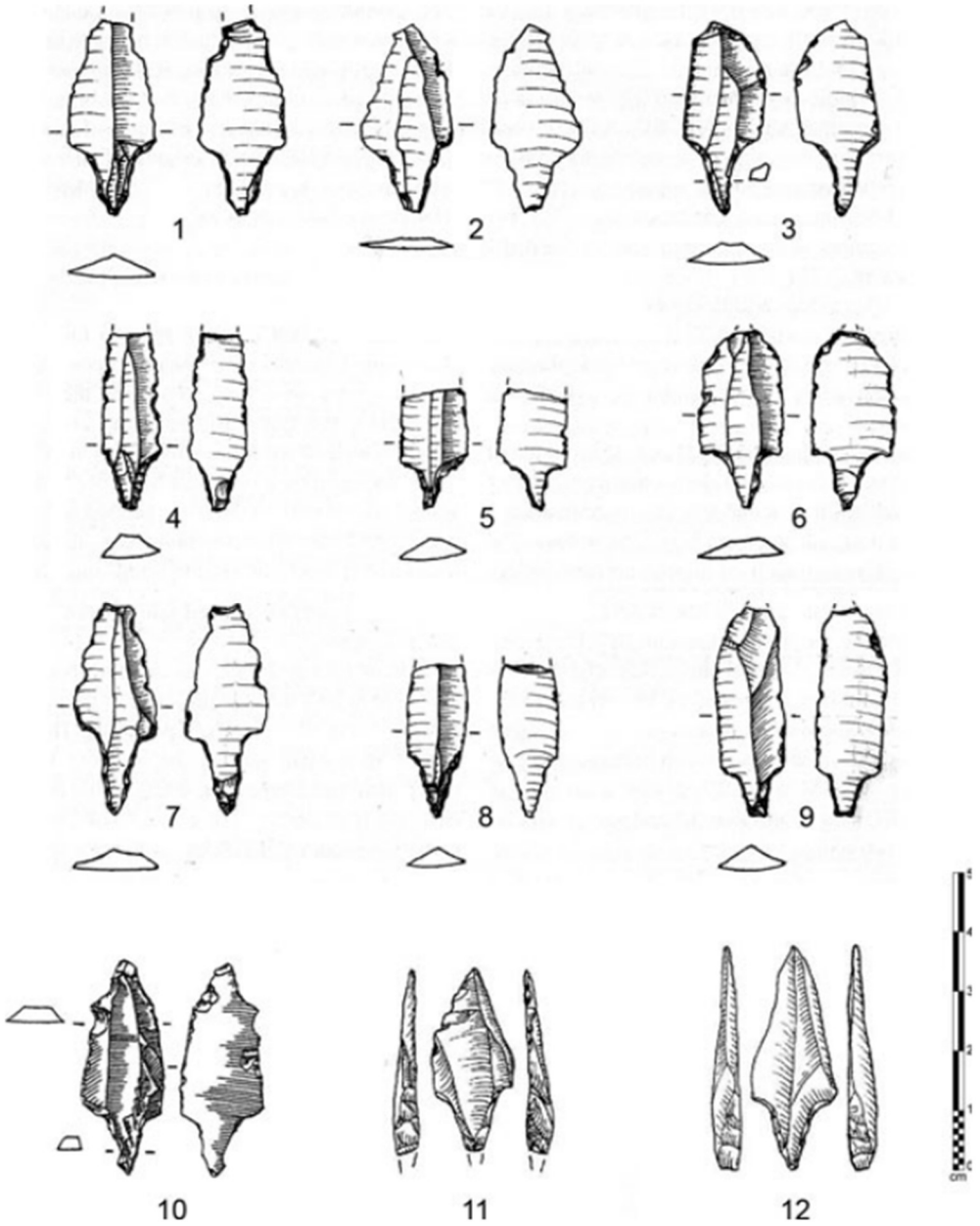

Figure 2.3 Fasad points of the Faya tradition. 1-3 from Nad al-Thamam in the UAE (Uerpmann et al., 2009, p. 209); 4-9 from FAY-NE01 in the UAE (Uerpmann et al., 2009, p. 209); 10 from Sharjah Tower (Millet 1988, as cited in Charpentier & Crassard, 2013); 11-12 from the Rothfels collection at the Al-Ain Museum (Kallweit, 2003, p. 58). Scale of 11-12 unknown. The scale bar is 5 centimetres. (Charpentier & Crassard, 2013, p. 33).

The third type are called the Fasad points from the Al-Haddah tradition. Examples of this type of point are shown in Figure 2.4. These points are made on irregularly shaped, short and thick flakes. A naturally occurring pointed or cutting edge is used as the distal part of the point. These points can have a great variability in shape and the tang can be created by all types of retouch (Charpentier & Crassard, 2013, pp 32-33). Bifacial, direct, inverse or alternate retouch. This type of Fasad point has been found in north-eastern Oman.

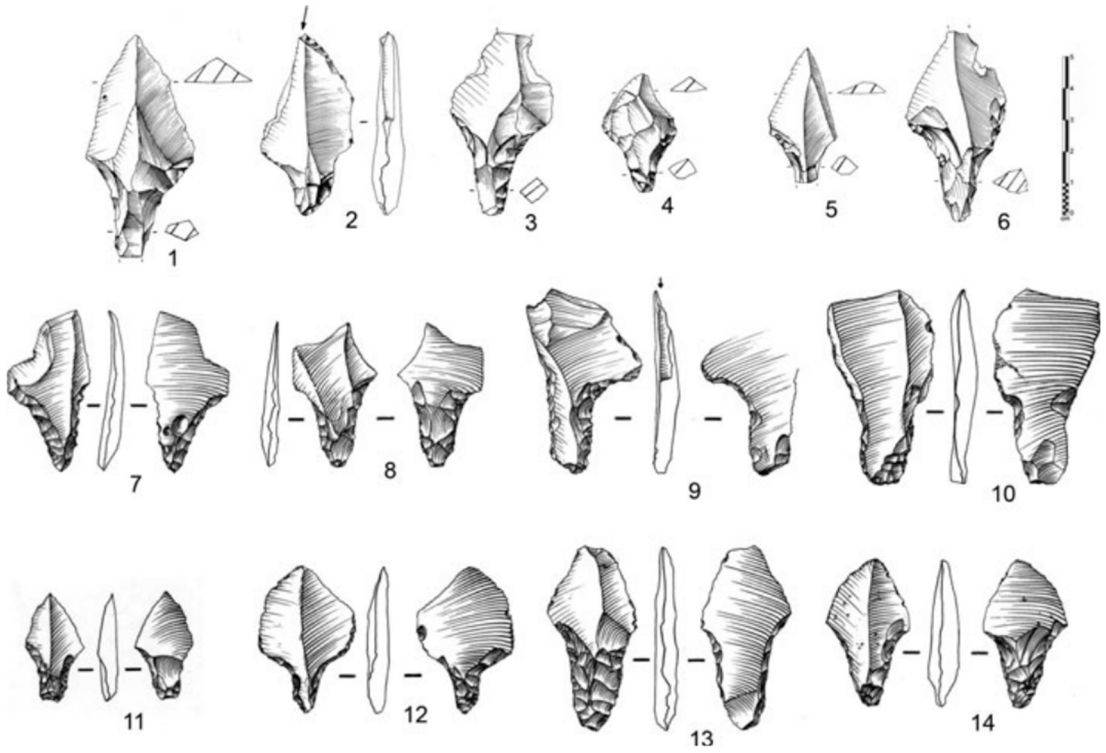

Figure 2.4 Fasad points of the Al-Haddah tradition. 1-6 from Ra's al-Jinz RJ-37 (Charpentier, 1991, p. 134); 7-14 from Al-Haddah BJD-1 (Charpentier et al*., 1997, p. 102). The scale bar is 5 centimetres. (Charpentier & Crassard, 2013, p. 34).*

The differences between these types are according to the authors a good indicator for the regional differences and local traditions that were present during the Early Neolithic period. However, interpreting dispersion patterns, potential influence from neighbouring populations or the occurrence of technical convergence are not problems that can currently be solved (Charpentier & Crassard, 2013, p. 34).

Other lithic material

Besides the projectile points that make up a large part of the Fasad lithic industry other material has also been found. Blade flakes, side-scrapers and notches. No drills from this industry have been identified yet (Charpentier, 2008, pp. 95-97).

2.3.3.2. Habarut

The Habarut or trihedral points facies is the next Neolithic lithic entity in Oman and the surrounding region. It is dated from 6500-4500 BCE.

The industry can be called the trihedral points facies since a very important characteristic of the industry is its trifacial projectile points (Charpentier, 2008, p. 97). In contrast to Fasad lithic points which were often bifacial. Examples of trihedral points are shown in Figure 2.5.

Points

The trifacial or trihedral term used to identify these points stems from their main characteristic. The points have a clear triangular section. Sings of regular pressure retouch used in the production of these points is present (Charpentier, 2004, p. 53). The longest side of the triangle is often the side of the point which has been completely retouched. With the two shorter sides having been made by abrupt or semi-abrupt retouch (Charpentier, 2004, p. 53). When the trihedral point is less retouched in general the tang is sometimes the only shaped part of the point.

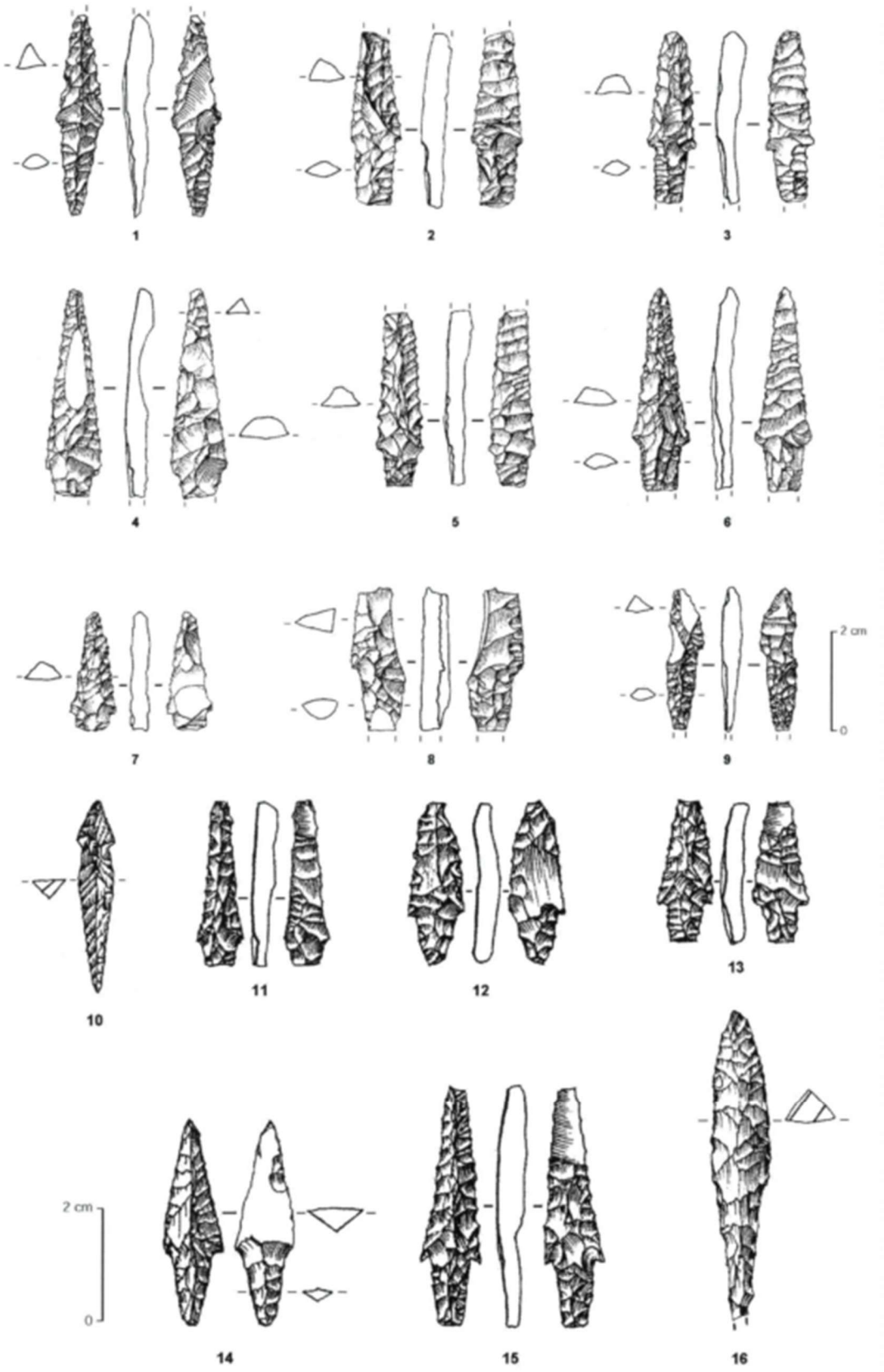

Figure 2.5 Examples of trihedral arrowheads. 1-9 from Marawah MR-1, Abu Dhabi in the UAE, drawn by G. Devilder; 10, 16 from al-Hawa site 17 in Yemen (Inizan et al., 1997, p. 143); 11-13, 15 from Suwayh SWY-1 in Oman; 14 from Marawah, Abu Dhabi in the UAE. The scale bar is 2 centimetres. (Charpentier, 2004, p. 55).

Charpentier identifies two distinct types of arrowpoints in the trihedral tradition. The first type are tanged points with tiny notches or ‘barbs’. Characteristic of this type is the length of the tang compared to shaft of the point. The tang is often quite big in this type. The second type are points lacking tangs or barbs. These points look more slender and oval, sometimes being called ’rods’ in the literature (Charpentier, 2004, p. 54).

Associated with these characteristic trihedral points bifacial points can also be found. They are also pressure-retouched but rarer than the trihedral points (Charpentier, 2008, p. 97).

Other lithic material

In assemblages associated with trihedral points larger tools like chisels and adzes have been found (Charpentier, 2004, p. 54). Smaller piercing tools have also been found such side-scrapers made on micro-lithic flakes and drills on bladelets (Charpentier, 2008, p. 97).

2.3.3.3. Suwayh

The Suwayh culture, as proposed by Vincent Charpentier lasts from around 4500-3700 BCE. He sees this culture as an innovation of the trihedral point facies coming before it instead of a replacement of it.

Points

The points that now become visible in the archaeological record are very slender points. They often have a fusiform shape and a diamond-shaped section (Charpentier, 2008, p. 98). These points are bifacial instead of trifacial. The entire point is retouched, sometimes ordered, meaning transverse parallel or oblique parallel (Charpentier, 2008, p. 100). Sometimes micro-denticulations are found on the edges. Examples of fusiform points are shown in Figure 2.6.

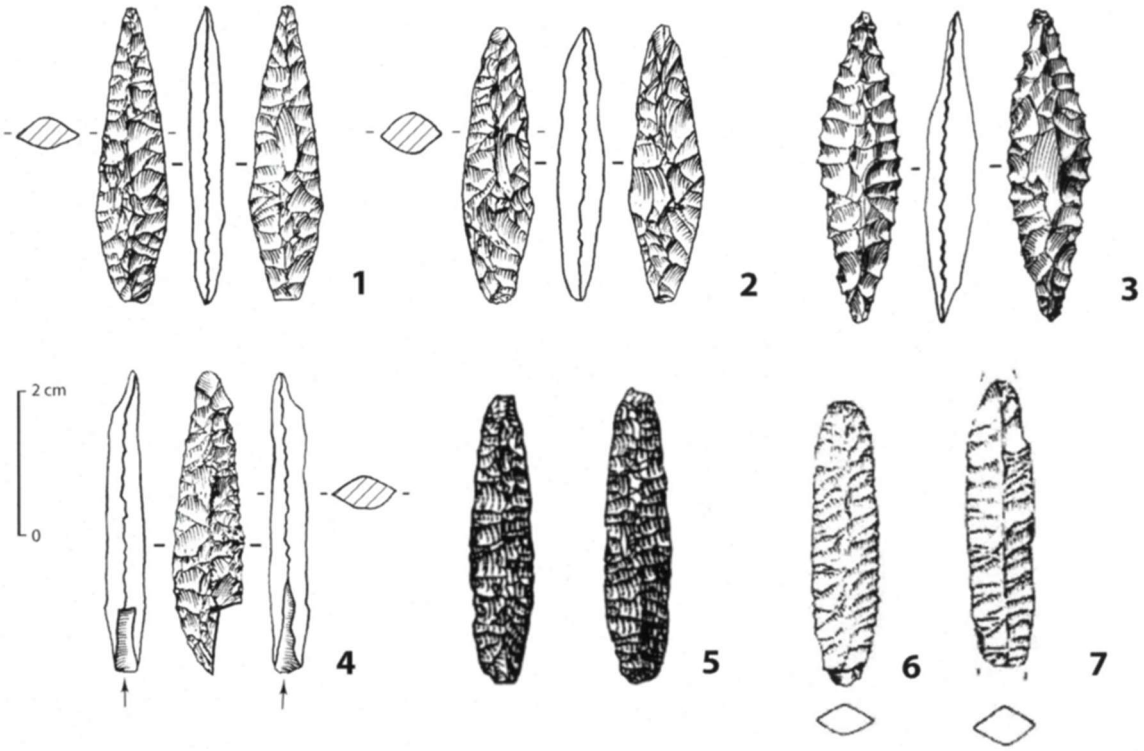

Figure 2.6 Examples of fusiform points. 1-2 from Suwayh SWY-1 section 5; 3 from Ruwayz RWY 1b4; 4 from Suwayh SWY-1; 5 from Ra's al Hamra RH-5, HWE/B, DA 7686 (from Italian archaeological mission in Oman); 6-7 from Ra's Shaqallah 1 (after Biagi 1988b in Charpentier 2008, p. 101). (Drawn by G. Devilder). The scale bar is 2 centimetres. (Charpentier 2008, p. 101).

Four types

Vincent Charpentier differentiates between four main types of points in the Suwayh lithic facies.

The first type are the fusiform points. This group can be divided into smaller groups based on the dimensions of the points. There are long and thin fusiform points, shorter and thicker ones, and wide ones. Certain points occur in different frequencies on various sites.

The second type are variations of foliate points with a convex base. Here there are observable differences between points with parallel edges and points where the edges converge at the base.

The third type are slender points with a tang and parallel edges. The tang is short and can have convergent edges.

A fourth type are barbed and tanged points which are rare in Oman but have been found more frequently in the United Arab Emirates (UAE) (Charpentier, 2008, pp. 101-105).

Other lithic material

Other lithic material found in the assemblage are knapped blade products on semi-turned nuclei (Charpentier, 2008, p. 98). Other bifacial tools besides points such as 'daggers', macro-drills, micro-drills, end-scrapers and side-scrapers.

2.3.4. Newer research

To build on the classification made by Vincent Charpentier we need information from sites located closer to Site 79, the location that is the topic of this thesis. Multiple stratified sites located in the central region of the Emirate of Sharjah in the UAE provide solidly carbon dated records for lithic material from the Neolithic. These sites are geographically located closer to Site 79 than sites in northern Oman are to sites in the eastern Ja'alan region in Oman for example. Hans-Peter Uerpmann et al. in a 2013 paper provided more information on Faya points. Certain blade points found at site FAY-NE1 were previously categorized under the Fasad umbrella. But they changed this to identifying them as Faya points (Uerpmann et al., 2013, p. 102). They keep the term Fasad for the larger and more irregular points, while Faya is used for finer Early Neolithic points. This site provides further confirmation that the Faya type points were more common in this region of Arabia compared to the other styles classed under the Fasad group.

A different region where relevant excavations are recovering Neolithic material is the Rustaq region in northern Oman. The sites close to the Western Hajar Mountains contain lithic artefacts and stratified contexts that may help in the identification of the artefacts found at Site 79. Based on similarities between the assemblage that was found there and the point types that were described by Charpentier the site was thought to be from the fifth millennium BCE. This was then confirmed by carbon dating a worked and unworked marine shell found (Bretzke et al., 2018, p. 109). This radiocarbon dated material provides a solid comparison source.

2.3.5. Potential problems

A weakness of my study of the lithic assemblage at Site 79 will be that it depends for a large part on the classifications of arrowheads produced on the other side of the country in Oman. A lot of the work of Vincent Charpentier focuses on the Ja'alan region which is located in the east of the country. Luckily a second focus is the north and by extension what is now the UAE which is located fairly close to our site. The addition of data from some sites located closer to Site 79 will help to clarify the differences and similarities between our site in northern Oman and sites in other parts of the country. This hopefully means that the partial bias of Charpentiers work is balanced out.

Another potential problem is the fact that Charpentier's classifications are very detailed. The amount of lithic material that is going to be studied in this thesis may not be complete enough to say definitively what time periods are represented. Besides that, the small differences between the sub-classes for Fasad points for example may be difficult to recognize in the sometimes fragmented pieces from Site 79.

2.4. Site 79

2.4.1. Location

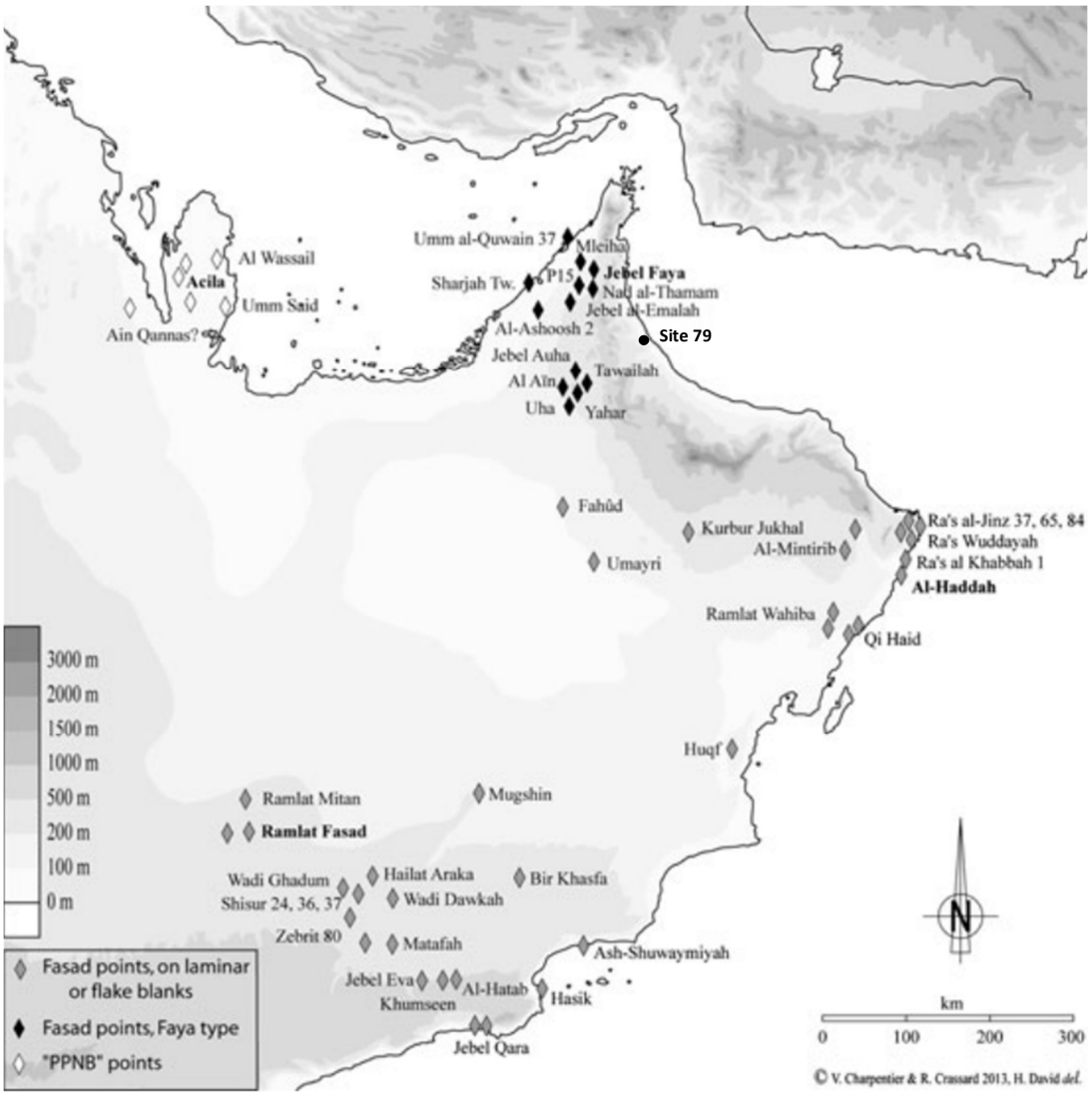

Figure 2.7 A map indicating the location of Site 79. Other sites where Neolithic arrowpoints were found are also shown (after Charpentier, 2013, p. 29).

Site 79 is located in very northern Oman in the Sohar region, as indicated in Figure 2.7. The site is inside the modern city of Sohar, which is part of the Al Batinah North Governate province. The site spans over two opposing river terraces at the edge of Falaj al Qaba'il (Düring, 2018, p. 15). It is located about 3 km away from the modern coastline. The site is located on higher terrain, offering a view over the rest of the landscape. Site 79 consists of two flint concentrations on the two river terraces. The biggest concentration of flint is on the western point of the eastern one of the two river terraces. This is located next to part of Site 76, specifically the Umm an Nar courtyard structure. A smaller flint concentration was found on a nearby old river terrace.

Site 76 is located immediately next to Site 79. Site 76 consists of terraced cairns, large round tombs likely from the Hafit or Umm an Nar period, an Islamic tower and the Umm an Nar square courtyard structure (Düring, 2018, pp. 17-18).

In more modern times houses have been built all around the area introducing threats to the preservation of the material and site. This will be discussed later on.

2.4.2. Previous archaeological activities

In the 1970s the location was sampled by the Danish Archaeological Expedition. After that, excavations of a structure from the transitional Hafit-Umm an Nar period were done in the area. During these excavations coincidentally some Late Neolithic arrowheads were found. The WAJAP team in 2018 were able to find the location where the tomb that Frifelt excavated in the 70s had likely stood. Here we will take a more in-depth look at what was found at each of the different surveys and the excavation that were done at the approximate location.

Danish expedition and excavation

K. Frifelt in her article describes a group of Umm an-Nar graves found in the Wadi Suq region on a gravel plateau close to Falaj al-Qaba (Frifelt, 1975, p. 374). It is close to the ruins of an Islamic tower, the same tower that is described by B. Düring in 2018.

Frifelt located features that she identified as multiple stone graves from more than one time period. The graves had been noticeably disturbed by routine stone-robbing. Two or maybe three Umm an-Nar period graves were recognized through the presence of pottery scatter and bone fragments, with the addition of soil impressions of large foundation stones. Two separate stone circles with inner dividing walls are still visible in the landscape. One of them had stones missing on two sides because two more recent cairn graves had been placed partially on top (Frifelt, 1975, p. 374).

The grave with missing stones was selected to be excavated and examined. It is pictured here in Figure 2.8. The grave contained inner walls that split the grave into multiple separate chambers. The grave was filled with bones and the remains of skulls. Inside the surface layers there was some fine Umm an-Nar Red Ware pottery. There was no clear floor layer inside the grave and the soil containing bone fragments gradually disappeared. The soil beneath that was sooty and contained a lot of discarded flint and the occasional arrowhead. Frifelt theorized that the grave was constructed on top of an old settlement or working site (Frifelt, 1975, p. 375).

Figure 2.8 An Umm an-Nar grave on a plateau in Wadi Suq. To the left, a later period grave that disturbed the Umm an-Nar grave is visible (Frifelt, 1975, p. 435).

J. Pullar wrote an article in which she briefly describes some of the Neolithic sites excavated by the Danish Archaeological Expedition, which includes the location of the excavation that Frifelt did. The focus of the excavation was the tomb. Pullar included a more detailed inventory of everything that was found in her article about the site. The tomb or grave structure was called grave 1134 and excavating revealed tools: multiple different types of scrapers, flakes, and retouched fragments. Waste flakes, chunks and core fragments were also collected (Pullar, 1985, pp. 57-59). 9 of the artefacts from the site were drawn and are shown in Figure 2.9 and 2.10. Back then there was speculation that the later period grave may have been placed on an older settlement, since animal bones and worked flint was found under the grave floor that was excavated (Pullar, 1985, p. 59).

The two flint concentrations that are now designated as Site 79 have the same origin as the lithic material that Pullar mentions in her article.

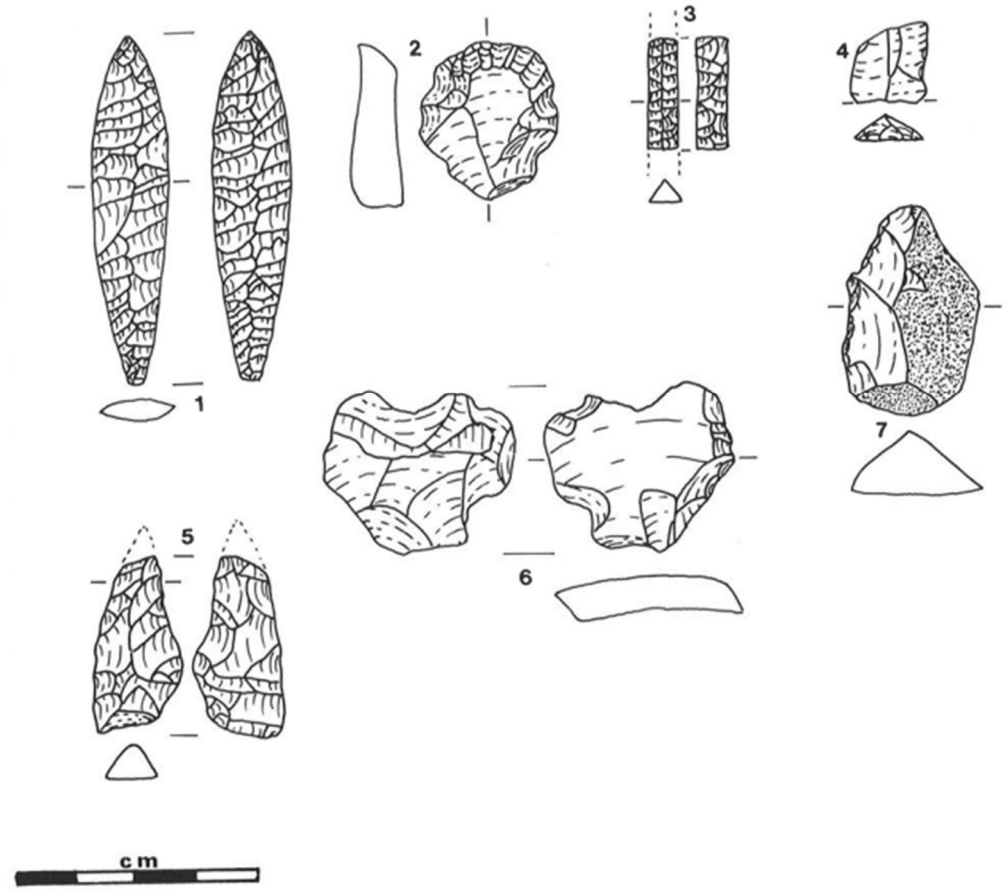

Figure 2.9 A selection of the lithic material found at Site 79 by the Danish Archaeological Expedition. 1 fusiform point; 2,6-7 scraper; 3 trihedral rod; 4 trihedral point fragment; 5 trihedral point. The scale bar is 4 centimetres (after Pullar, 1985, p. 58).

The material that was drawn was not identified by Pullar, but looking at Figure 2.9 number 1 closely resembles the examples of fusiform arrowheads that we saw in Figure 2.6, a slender point with retouch on all sides. Similar fusiform arrowheads have been dated to 4500-3700 BCE (Charpentier, 2008, p. 98). 2 and 7 are clearly scrapers, with 6 being less clear. Number 3 resembles a trihedral 'rod'. 4 and 5 both look like more or less fragmented trihedral points. When comparing these trihedral points to the points from Sharjah that were dated we get a range from about 7000-5500 BCE for these points (Uerpmann et al., 2013, p. 107). Figure 2.10 contains what is possibly a core and a big side scraper.

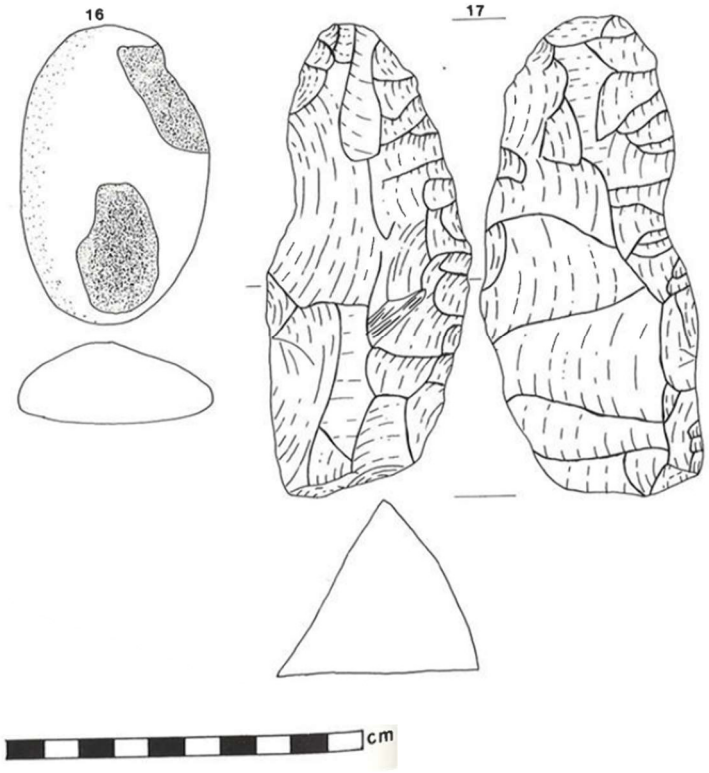

Figure 2.10 More lithic material found at Site 79 by the Danish Archaeological Expedition. 16 core?; 17 scraper. The scale bar is 10 centimetres (after Pullar, 1985, p. 56).

WAJAP survey

The Wadi al Jizzi Archaeological Project or WAJAP is an archaeological landscape survey and excavation project taking place in the Wadi al Jizzi region of Oman. The area spans from the foothills of the Hajar al Gharbi mountains to the Al Batinah coast of northern Oman. The project investigates archaeology ranging from the Palaeolithic to the early Modern period. It is a joint effort between Leiden University and the Ministry of Heritage and Tourism of Oman (Wadi al Jizzi Archaeological Project, n.d.).

The data from WAJAP that was used for this thesis was information from their database, mainly about the lithic finds of Site 79. Besides that, the drawings and pictures of the collected material are included in this thesis as well. The 2018 report about the activities of WAJAP written by B. Düring has been useful for the basic background information about the site.

During the WAJAP survey in 2018 two flint concentrations were identified clearly for the first time. Instead of a vague mention of some flint in an excavation report for a structure from another period, we now have some more information directly concerning the Neolithic material itself.

The flint was found mainly in the previously discussed two concentrations. These two concentrations were surveyed, and the surface finds were collected in 2 different loci. The location of the two loci is visible in Figure 2.11. Locus 1 is located on a western tip of the eastern river terrace, locus 2 is located on a nearby, old river terrace. Locus 1 for the bigger concentration, locus 2 for the smaller one. Locus 1 is the most important one while the inclusion of locus 2 in the studied material is a bit less certain. There is still a question about whether this material belongs to the same context. However, for the purpose of this thesis we will study locus 1 and 2 together.

11 of the 13 arrowheads that were identified by the team were found in locus 1. Other finds include cores and retouched tools like blades, scrapers and some drills. Small and thin flakes were collected as bulk finds. The amount of core fragments and chips suggest that this site was some kind of production location and knapping was part of the activities taking place here (Düring, 2018, p. 16).

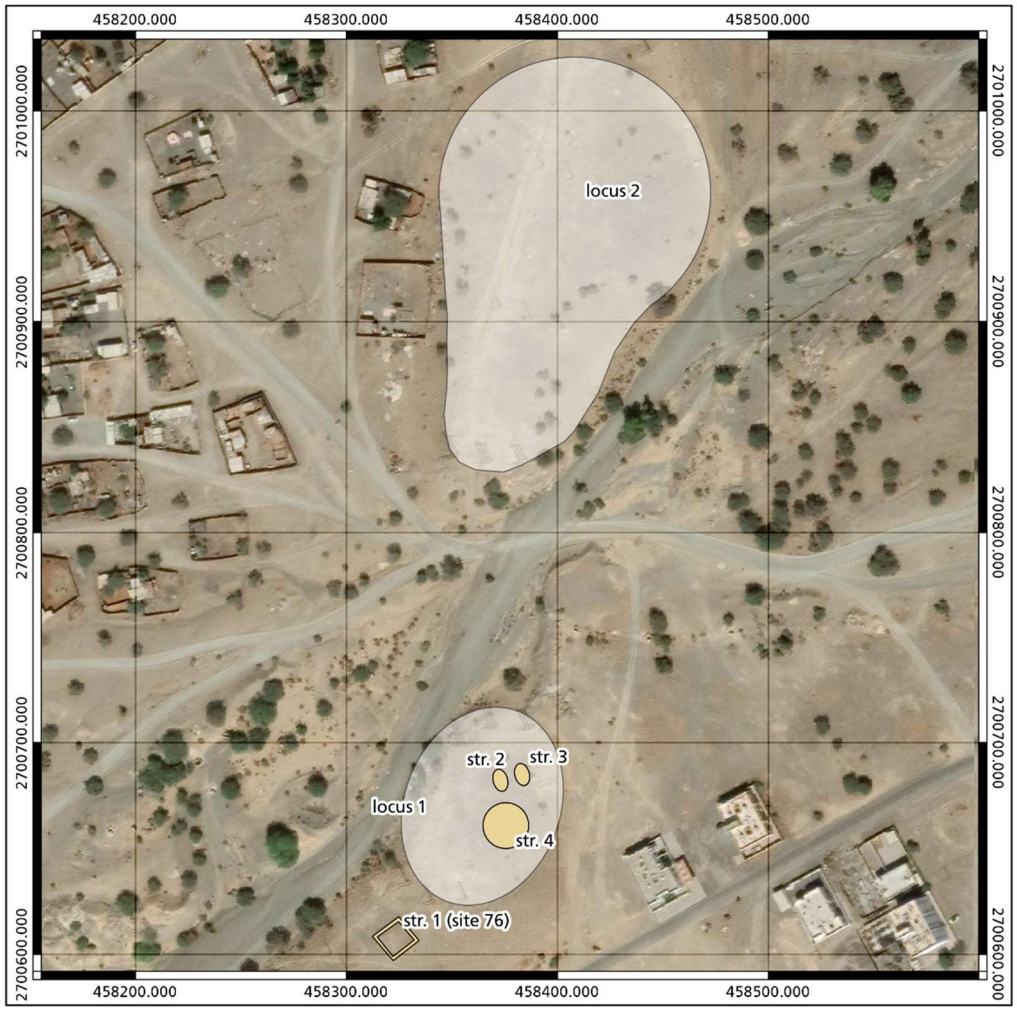

Figure 2.11 A map showing the relative location of locus 1 and 2. As is visible the two loci are on different river terraces. (Map from WAJAP)

The drills that were found were identified as microdrills comparable to ones described by Charpentier in his 2008 paper. One blade that was found was identified as having been a knife tool. Multiple notched flakes were categorized together. Around 13 scrapers were described as well, with surprisingly a larger amount having been found in locus 2.

The finds are rarely affected by calcareous concretions. A surprising aspect of all the different chipped stone artefacts is the large variety of raw materials that was used to create them. Quarts, flint, chert and others. Some of it being relatively low quality (Düring, 2018, p. 16). The arrowheads that were found on Site 79 will be further discussed in detail in the later chapters of this thesis.

2.4.3. Disturbed context?

Site 79 has gone through recent and observed disturbances. Construction and bulldozing have possibly been occurring since the 1970s and have been observed by the WAJAP team in 2018. The occurrence in 2018 was noticed on 22 January of that year and consisted of a large pit being dug through the main concentration of artefacts. This destruction of a large part of the site was caused for the purpose of the the construction of three large electricity poles (Düring, 2018, p. 16).

The suburb of Sohar called Falaj al Qaba'il has been expanding around Site 79 and the adjacent site 76 as well. Large surface areas have been bulldozed for construction. Site 76 also had poorly preserved cairn structures due to tomb robbing and stones of the cairns having been used for construction in the past (Düring, 2018, p. 17). This means that potential structures or specific artefacts that were originally present at Site 79 could also have been taken.

A complication of only examining surface finds it that the fact that they are on the surface means that they were influenced by natural weathering processes during that period. Deflation is a well documented occurrence and problem in dry desert environments. Small chips can be washed away or taken away by the wind making the collected finds a selection of what was once deposited there. Small arrowheads could have been lost which could potentially introduce bias. This can then possibly influence the interpretation of the site, if for example bigger arrowheads are more likely to come from another time period than smaller arrowheads. Luckily, there were no signs observed in 2018 by the WAJAP team that such extensive disturbance of the site had taken place. The only likely occurrence due to the passing of time is subsidence or settling of the earth surface.

Bias during surface collection can also have occurred in the collection of the finds from Site 79. For example, when small artefacts look similar to the natural stones and thus get overlooked.

2.5. Conclusion

To conclude, the so-called Neolithic period in Oman looks different to what the Neolithic period is assumed to look like in other parts of the world. During the Holocene moist phase people took advantage of the more fertile land and the subsistence strategies were able to be expanded and diversified. Due to sea level changes the coastline in northern Oman has changed from the Neolithic period to now making it harder to identify Neolithic sites. The chronology of lithic industries in Oman is roughly divided into three parts, the first part characterized by Fasad points and ranging between the ninth and seventh millennium BCE. Followed by Habarut points which are recognized by their trihedral form. This period lasted from 6500 to 4500 BCE. These trihedral points continue to be visible in the archaeological record during the following period, however the new addition to the archaeological record are fusiform arrowheads. These slender points indicate a new period lasting from around 4500 to 3700 BCE.

This rough division into different periods is more complicated locally and certain types of arrowheads are known from sites closer to Site 79, which makes them better material for comparison.

These periods visible in the archaeological record of Oman are useful for our analysis of Site 79, an archaeological site located in northern Oman. An excavation and multiple expeditions have taken place there revealing material ranging from the Neolithic to the Islamic period. The focus of this thesis is the Neolithic material.

3. The lithics of Site 79

Introduction

As mentioned earlier, the finds discussed here were collected by a survey done in 2018 by the WAJAP team. This means the finds are a snapshot of the activity that was once present on the location. Besides the 9 artefacts that were drawn in Pullars article, we sadly do not have access to other finds that were collected in the past on this location. We only have the surface collection to work with, no excavation of a potential Neolithic period layer has taken place here. The two loci will be taken together since we do not know exactly how big the site originally was. First the arrowheads that were found will be described and. Pictures and drawings of the finds will be included to clarify the points made about the finds. At the same time observations and comparisons of the lithics with the literature will be made. Then after that the results of that comparison will be discussed. Which include what the finds may say about the site and what it was used for and which periods the site has been in use. Finally, the conclusion which will shortly summarize the analysis and result of this chapter.

3.1. Analysis

Figure 3.1 The thirteen suspected arrowheads found at Site 79. (Picture taken by Bleda Düring, 2018).

Figure 3.2 The other side of the thirteen suspected arrowheads found at Site 79. (Picture taken by Bleda Düring).

The lithics included in these pictures were selected by the WAJAP team as probable arrowheads found at Site 79. Their find numbers in Figure 3.1 from the upper left to the lower right are: L1_F53, L1_F50, L2_F50, L1_F46, L1_F52, L1_F47, L1_F48, L1_F55, L1_F51, L2_F9, L1_F54, L1_F56, L1_F49. The L stands for the locus the arrowpoint was collected in, the F stands for the find number. Figure 3.1. shows one side of the lithics. These same lithics are depicted in Figure 3.2 but this time turned the other way around.

Appearance

The arrowheads show a remarkable amount of colour variation ranging from green to red to dark-brown to yellow. Some of the source material also looks to be of differing quality but that is difficult to confirm without testing. The location where the material originally comes from has not been found yet so we do not know the distance these materials travelled. Some of the arrowheads are bigger than others and some are almost finished or finished while others are only in the starting stages of arrowhead production.

We can see that some arrowheads have pronounced tangs while others completely lack one. The presence and appearance of a tang is a characteristic of an arrowpoint that can help us to categorize it. I would say that 5 of the pictured arrowheads have a pronounced tang, 2 have a small tang, 6 of the arrowheads do not have a tang or the tang is not present due to later damage or unfinished production.

A beautiful example of an arrowpoint with a very clear tang is L1_F54 from this assemblage. The drawing in Figure 3.3 shows the pronounced tang. The tang here is not a gradual tapering to a point but a clear protrusion from the rest of the arrow.

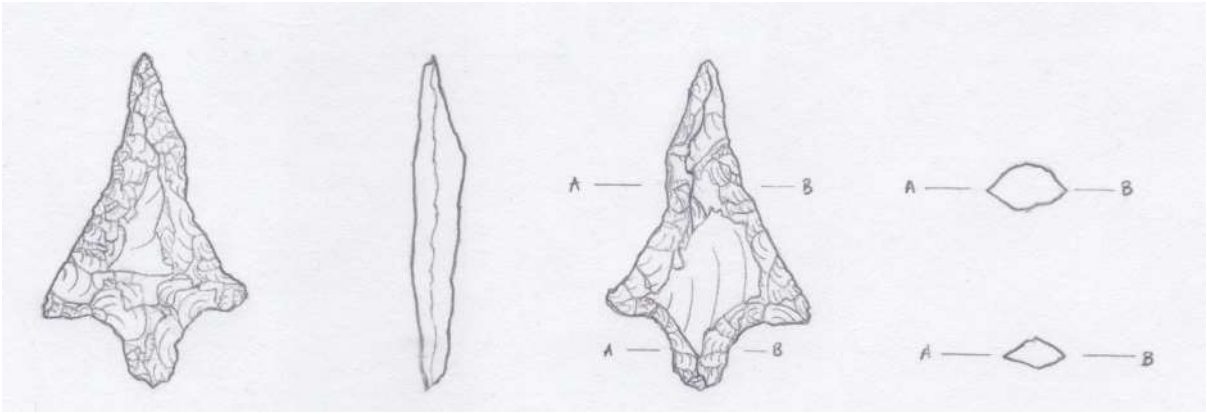

Figure 3.3 Drawing of arrowhead L1_F54. (Drawn by Floriske Meindertsma, 2018).

If we look at the drawings made of these points we notice that some of the arrowpoints are trifacial while others are bifacial.

The tang and the section are probably the most important parts of the arrow to look at to achieve the goals of my research. But other aspects like the amount of retouching, the overall shape of the arrow and the scar patterns on the arrow can also give information on the production techniques and thus on the possible origin of the arrowhead. All the points have been retouched but some more extensively than others.

Looking at individual arrows

L1_F53, shown in Figure 3.4, is a reddish-brown and grey projectile point. It is made from stone with a medium grain size. The tip and the tang of the point have been broken or are unfinished. The length of the current remaining point is 22 millimetres which is on the smaller side in this assemblage. The arrowpoint is almost oval shaped, quite different than the other arrowpoints found at the site. The point has been retouched on almost every side. The section of the point is trihedral shaped. When comparing this point to the examples shown in Figure 2.5 earlier in this thesis the shape is very close to some of the trihedral arrowheads. If we look at L1_F53 it is very likely that the

very tip has broken off making it an even closer match to the usual appearance of a trihedral arrowhead. Similar arrows have been dated to around 4500 BCE (Uerpmann et al., 2013, p. 107).

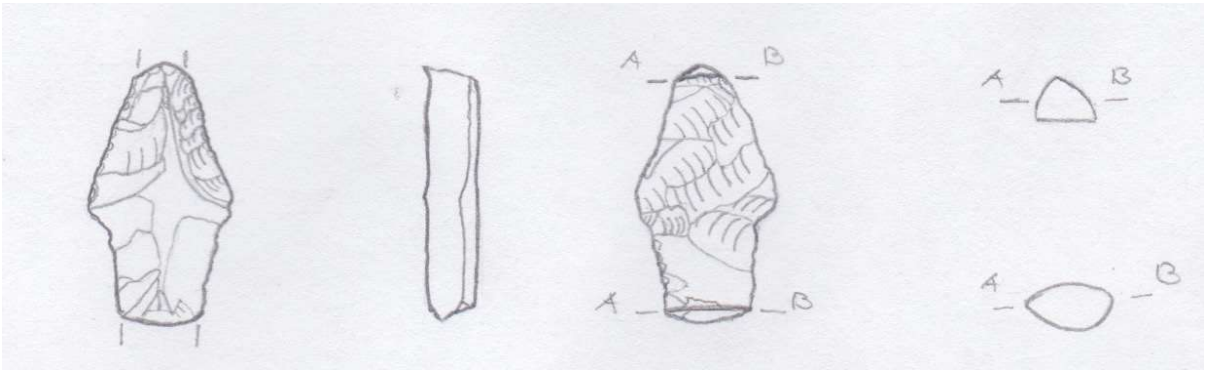

Figure 3.4 Drawing of arrowhead L1_F53. (Drawn by Rita Kremer-Langen, 2018).

L1_F50, shown in Figure 3.5, is a reddish-brown tip of an arrowhead. It is made from stone with a medium grain size. Retouch is present on all surfaces of the point and because it has broken off in the past there is no tang present at all. The length of the tip is only 13 millimetres. The shape of the section may not be representative of the entire point. The fragment could be broken off from a fusiform bifacial arrowpoint. It looks fairly narrow, and the pattern of retouch looks similar to fusiform points, see Figure 2.6. Fusiform points are dated to around 4500 to 3700 BCE.

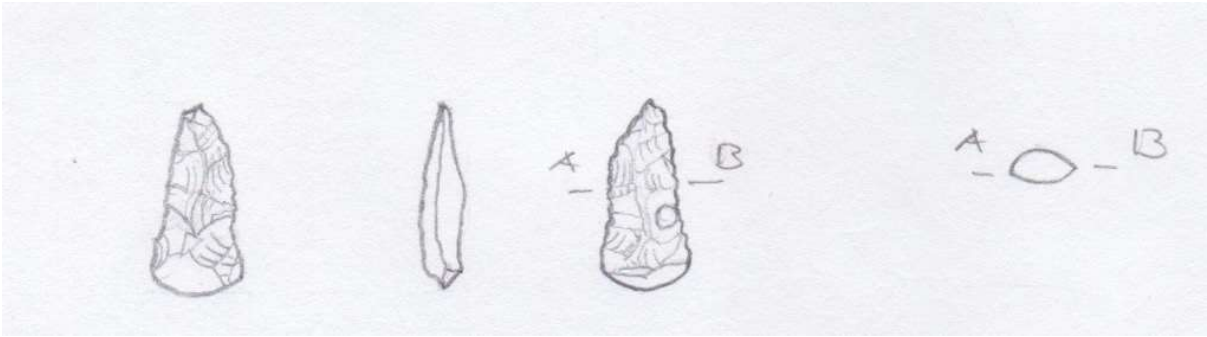

Figure 3.5 Drawing of arrowhead L1_F50. (Drawn by Rita Kremer-Langen, 2018).

L2_F50, shown in Figure 3.6, is a multicoloured tip of an arrowhead. It is made from a fine grained yellow-brown stone with white and brown bands. The length of the point is 22 millimetres. The arrowhead is retouched but skewed. The section of the arrow is trihedral however the rest of the shape of the arrow does not correspond at all to other trihedral arrowheads. I have not been able to find any similar looking dated arrowheads in the literature.

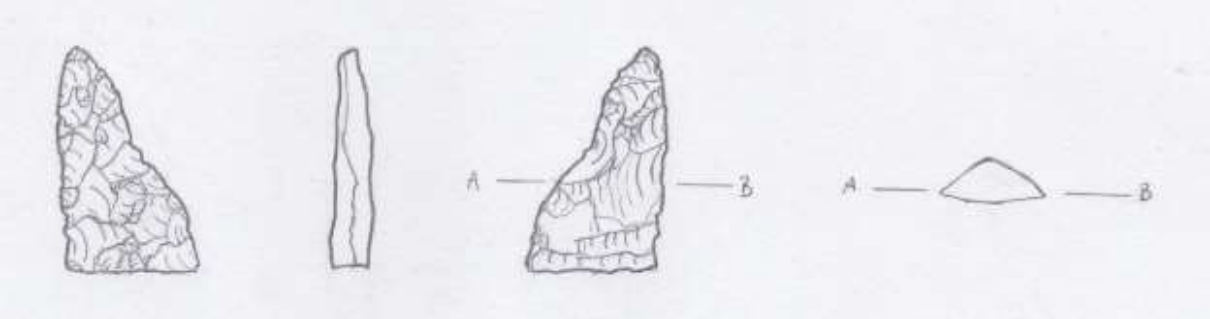

Figure 3.6 Drawing of arrowhead L2_F50. (Drawn by Floriske Meindertsma, 2018).

L1_F46 is a reddish-brown arrowhead broken into two matching pieces. Figure 3.7 shows the two pieces connected. The point is made from stone with a medium grain size. It is made from a banded stone which gives it a whiteish band in the top part of the point. It has been retouched, but mainly on one face, pointing to an abandoned production process. The arrowpoint may have broken before it was finished. The length of the pieces combined is 30 millimetres. The point looks similar to Fasad points, possibly the Faya type. These are the Fasad points found in the north of Oman and in part of the UAE. Faya Fasad points which were found at a site in Sharjah in the UAE associated with marine shells which were dated to around 8450–7760 and 7000–6450 BCE (Uerpmann et al., 2009, p 210). This means L1_F46 could date to between 9000-6000 BCE.

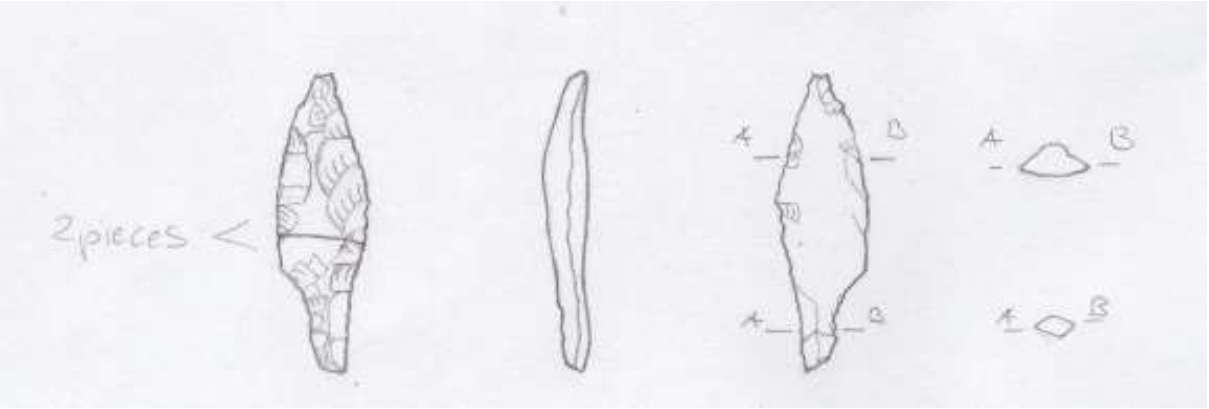

Figure 3.7 Drawing of arrowhead L1_F46. (Drawn by Floriske Meindertsma, 2018).

L1_F52, visible in Figure 3.8, is a grey-brown coloured, unfinished arrowhead. It is skewed and partially retouched, the retouch present mainly on one face and partially on the other face. It is made from stone with a medium grain size. The length of the projectile point is 20 millimetres while the width is 23 millimetres. So the point is wider than it is long. It looks similar to a bifacial point described by Bretzke, which is dated to 4000 BCE (Bretzke et al., 2018, p. 108).

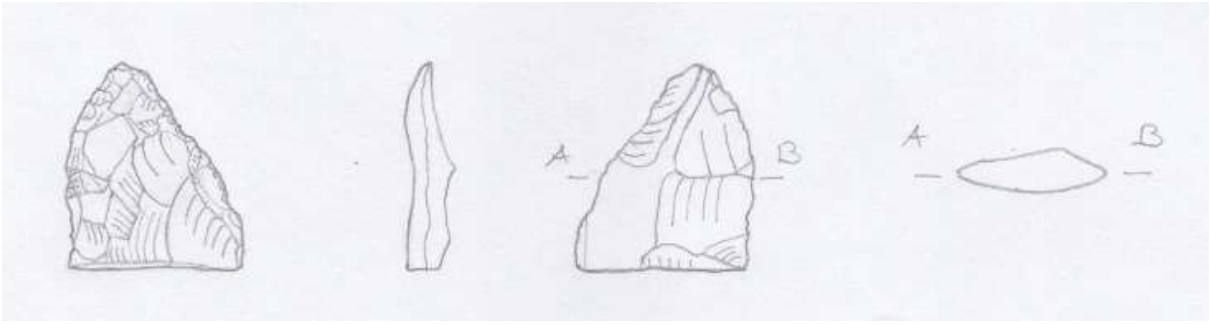

Figure 3.8 Drawing of arrowhead L1_F52. (Drawn by Rita Kremer-Langen, 2018).

L1_F47, shown in Figure 3.9, is a dark brown coloured arrowhead. It is relatively big compared to the other projectile points at 30 millimetres in length. It is made from stone with a medium grain size. There is a clearly visible tang present on the point. The point is not completely symmetrical and the amount of retouch is minimal. The WAJAP project described the point as having disturbances in the stone on two sides. It looks like the projectile point was abandoned due to issues that would make it impossible to make a finished arrowhead. This point also resembles a Fasad point of the Faya type. Just as F1_F46 this arrowpoint could be dated to a period between around 8450–7760 and 7000–6450 BCE, or roughly between the ninth and seventh millennium BCE (Charpentier & Crassard, 2013, p. 30).

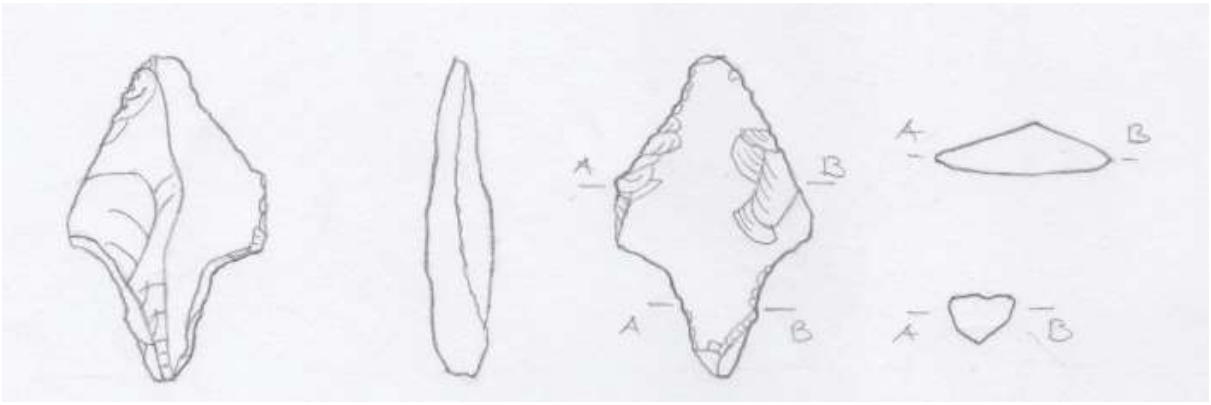

Figure 3.9 Drawing of arrowhead L1_F47. (Drawn by Rita Kremer-Langen, 2018).

L1_F48, shown in Figure 3.10, is a red coloured arrowhead with a considerable amount of retouch. It is made from stone with a medium grain size. There is a tang present on the projectile point but it may have been longer and partially broken off. The length of the point is currently 26 millimetres. A flake has been chipped off on one side and the flint contains disturbances on multiple sides. This point looks like an unfinished barbed and tanged point. These barbed and tanged points are dated to around 4000 BCE based on comparison to dated material from FAY-NE1 (Uerpmann et al., 2013, p. 107).

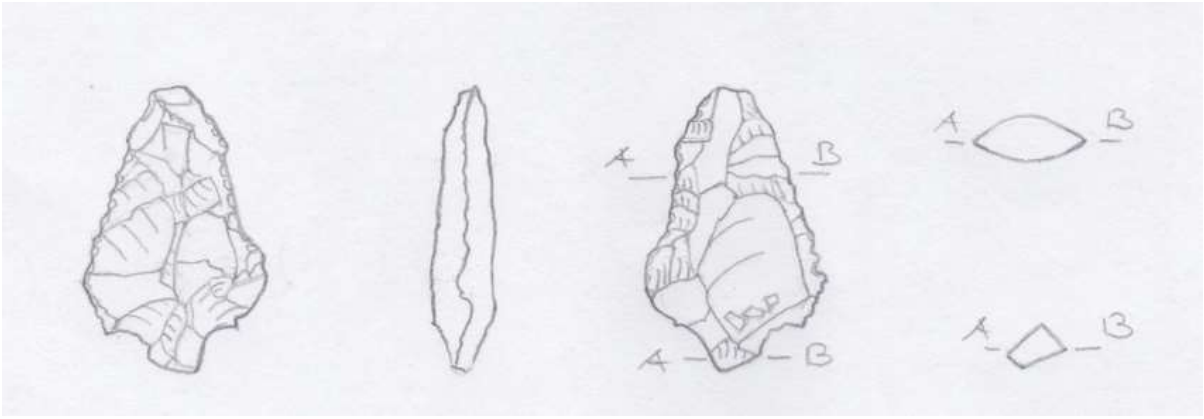

Figure 3.10 Drawing of arrowhead L1_F48. (Drawn by Rita Kremer-Langen, 2018).

L1_F55, shown in Figure 3.11, is a beige projectile point. The stone it has been made out of has a mottled appearance with reddish dots and grey areas being present. It is made from stone with a medium grain size. The arrowhead has been retouched but in a particular way. The retouch is only present on the sides of the point, not on the faces. It also gives an unfinished appearance since this retouch is more present on the edges when looking from one side compared to the other. This projectile point has a big tang compared to the size of the rest of the point. Almost half the length of the point is just the tang. The length of the point is 32 millimetres.

The shape of the section of the body of the arrow is irregular, possibly due to the unfinished nature of the point. The point has retouch present on the body which would be unusual for a Fasad point. However the section of the point is not trihedral. I am not completely certain but the closest example in the literature seems to be a bifacial arrowhead stemming from the same period as the trihedral facies. The extremely long tang closely resembles examples of arrowheads found at the FAY-NE10 site. Charpentier's article (2008, p. 99) includes some material from the Suwayh SWY-1 site which has been dated to 5500-4500 BCE, the close resemblance between a couple of these bifacial arrowheads and L1_F55 means that it could be from around that same period.

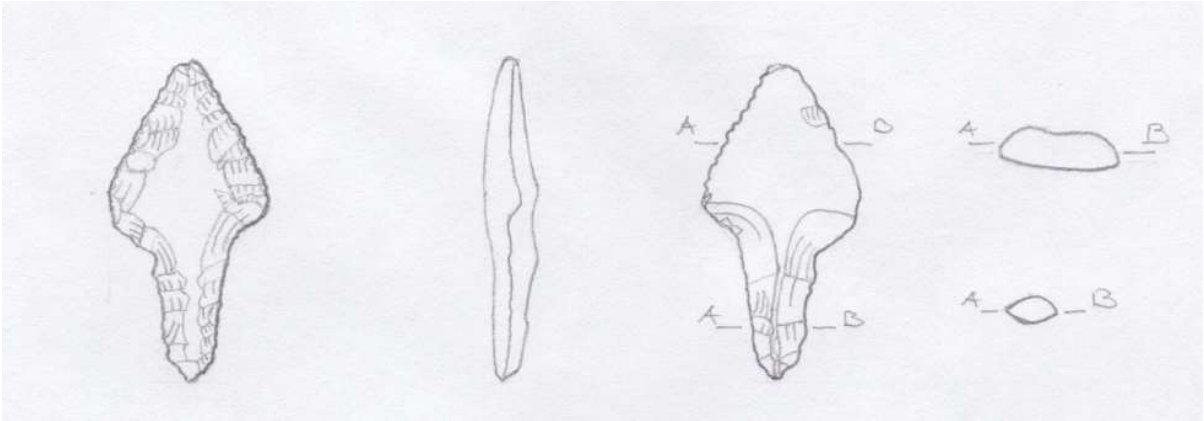

Figure 3.11 Drawing of arrowhead L1_F55. (Drawn by Rita Kremer-Langen, 2018).

L1_F51, shown in Figure 3.12, is brownish-grey coloured and looks to be a fragment of an unfinished arrowhead. It is made from stone with a medium grain size. The point is partially covered in a calcareous concretion on one side. The point has been retouched on both sides. There is currently no tang visible on this point. The length of the point is 37 millimetres, one of the bigger arrowpoints collected at Site 79. The drawing of L1_F51 looks very similar to what M. Uerpmann calls bifacial foliates. She hesitates to call them points since they are not very pointy. In her categorization our object seems to be a 'simple foliate'. Bretzke also describes a similar piece and dates it to 5500–4800 BCE, this is a slight offset to Charpentier's Suwayh facies (Bretzke et al., 2018, pp. 110-111). These include similar looking material which is dated by Charpentier to 4500-3700 BCE. Since the material where Bretzke's dating is based on is located geographically closer to Site 79 we will go with his dating of 5500-4800 BCE.

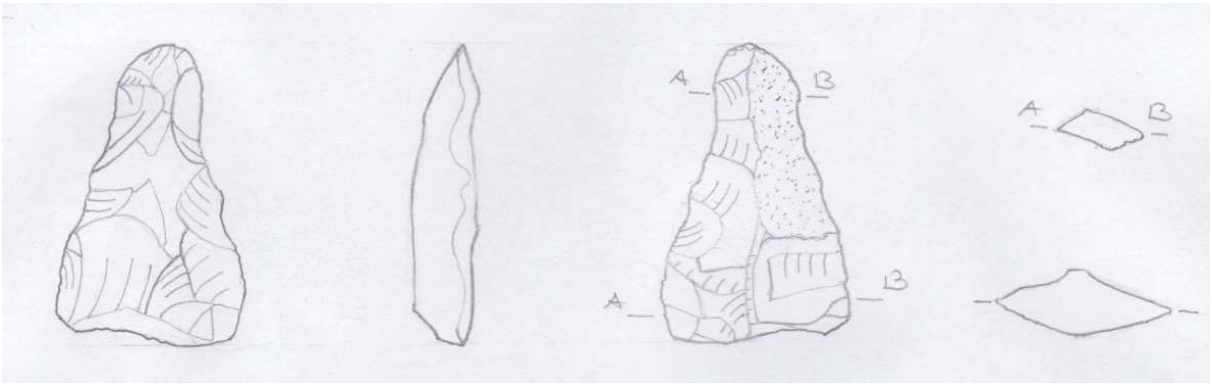

Figure 3.12 Drawing of arrowhead L1_F51. (Drawn by Rita Kremer-Langen, 2018).

L2_F9, shown in Figure 3.13, is a light grey coloured unfinished lithic tool. It is made from stone with a medium grain size. It is unclear whether the rough looking part close to the point is a remaining part of the cortex of the flint or whether the object is partially covered with a calcareous concretion. The tool has been retouched, mainly on the sides. Its length is 34 millimetres. The object was registered by the WAJAP team as being an arrowhead however it more closely resembles a Neolithic borer in my opinion. Figure 3.14 shows a Neolithic borer that looks extremely similar to L2_F9. The borer in Figure 3.14 was dated by Bretzke et al. to be from the fifth millennium BCE based on comparison with other Neolithic material (Bretzke et al., 2018, p. 106). This means L2_F9 likely dates to around the same time.

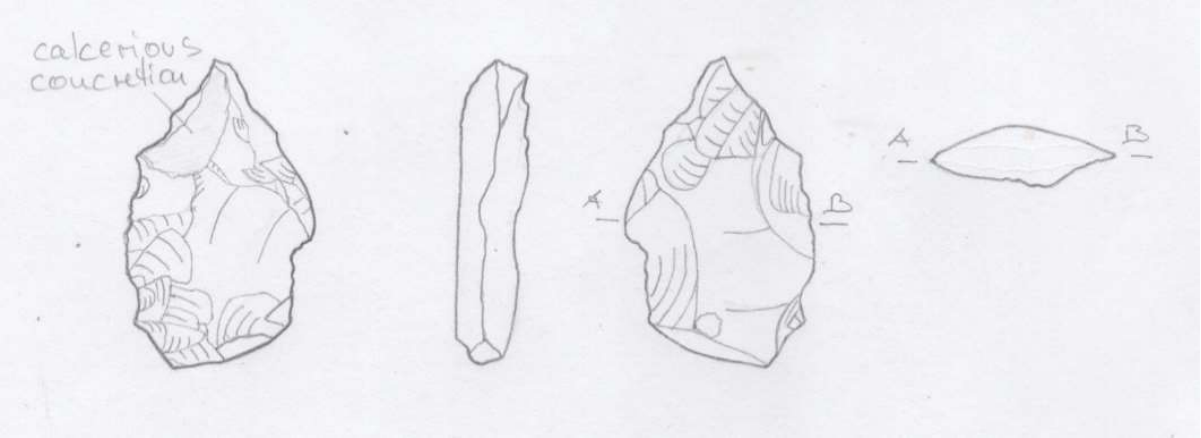

Figure 3.13 Drawing of arrowhead L2_F9. (Drawn by Rita Kremer-Langen, 2018).

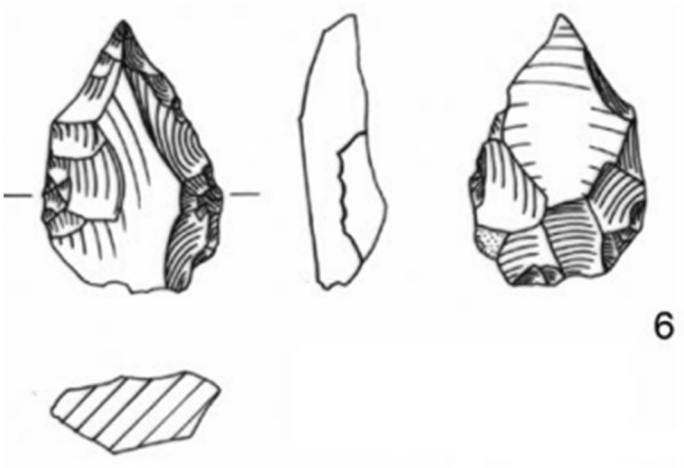

Figure 3.14 A borer from a Neolithic site in the Rustaq area. Drawn by Amy Oechsner (Bretzke et al., 2018, p. 106).

L1_F54, shown in Figure 3.15, is a dark brown coloured arrowhead. It is made from stone with a fine grain size. The point has been extensively retouched at the sides. The point is not symmetrical. There is a tang present on the point. The length of the point is 35 millimetres. The arrowhead closely resembles an arrowhead described by Uerpmann et al. in 2013. That particular winged arrowhead was found in a dated context. That means when comparing arrowhead L1_F54 morphologically it may stem from the same time period. With the comparable arrowhead found at the FAY_NE1 site dated to the Late Neolithic, around 4000 BCE (Uerpmann et al., 2013, p. 104). It may be a barbed and tanged arrowhead described by Charpentier as occurring as part of the Suwayh culture.

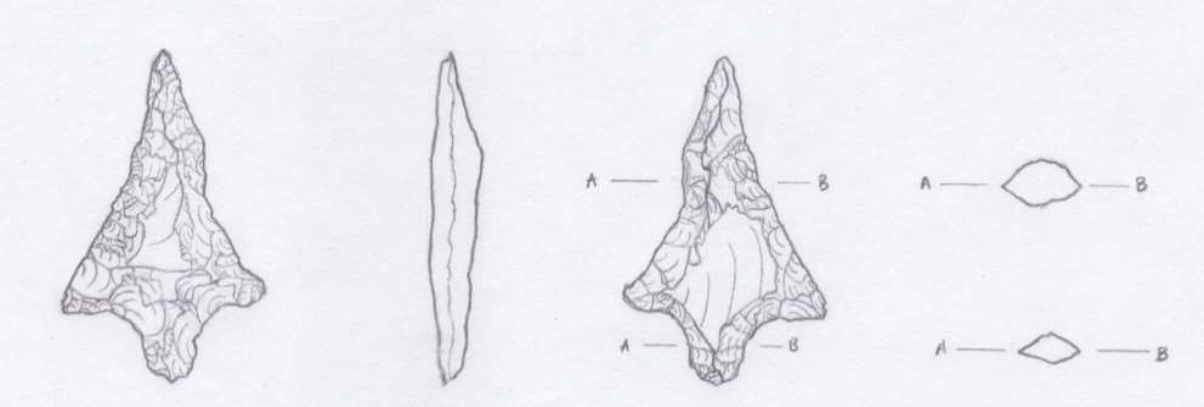

Figure 3.15 Drawing of arrowhead L1_F54. (Drawn by Floriske Meindertsma, 2018).

L1_F56, shown in Figure 3.16, is a greenish-grey unfinished arrowhead. It is made from stone with a fine grain size. The blade has been damaged and weakened by an extensive and deep surface retouch. A small part of the cortex is still present. The arrowhead was possibly abandoned due to the fact it could not be made into a useable arrowhead anymore. The tang is too narrow due to the extensive retouch. The drawing of this point, Figure 3.16 shows more of the tip than the pictures at the start of this chapter, Figures 3.1 and 3.2. Maybe part of the tip broke off during processing of the finds. The length of the point that was recorded in the database is 37 millimetres. The retouch around the sides of the point looks very similar to the retouch visible on L1_F54 in Figure 3.15 however L1_F56 is missing a clear tang and seems unfinished. If we ignore the unfinished tang and look at the rest of the arrow the closest comparison in the literature seems to be the same as arrow L1_F54, a barbed and tanged arrowhead, dating to around 4000 BCE.

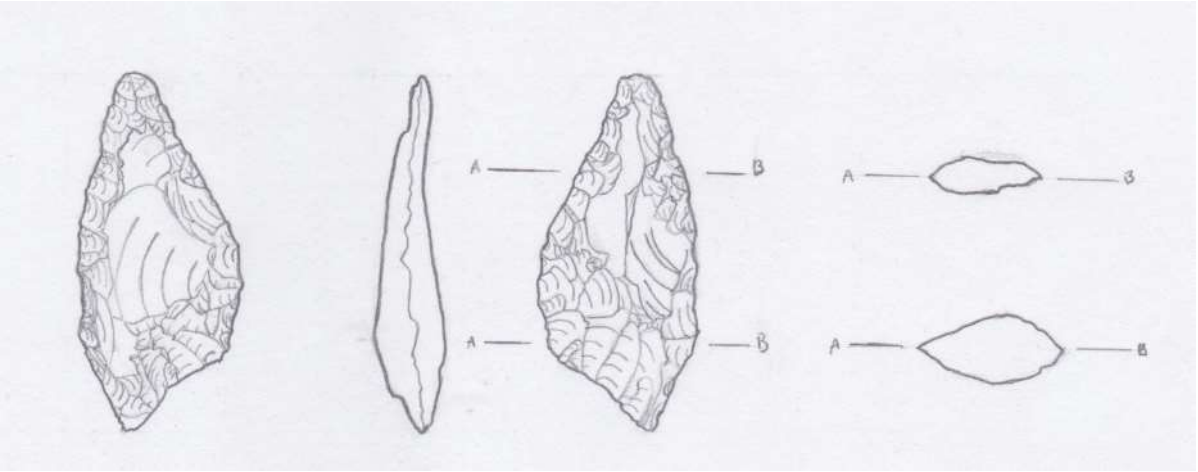

Figure 3.16 Drawing of arrowhead L1_F56. (Drawn by Floriske Meindertsma, 2018).

L1_F49, shown in Figure 3.17, is a reddish-brown fragment of a lithic tool. It is made from stone with a medium grain size. If it was intended to be an arrowpoint the tip and the tang of the point are broken off or unfinished. One side of the object consists of cortex almost entirely and is covered

with calcareous concretion as well according to the WAJAP database. There is retouch present, mainly on the opposite side to the cortex. The tool looks quite crude and unfinished. It may have been abandoned after parts of it were broken off or it may simply be unfinished. The length of the lithic is 29 millimetres. In its current state it is not possible to determine what time period it could date to.

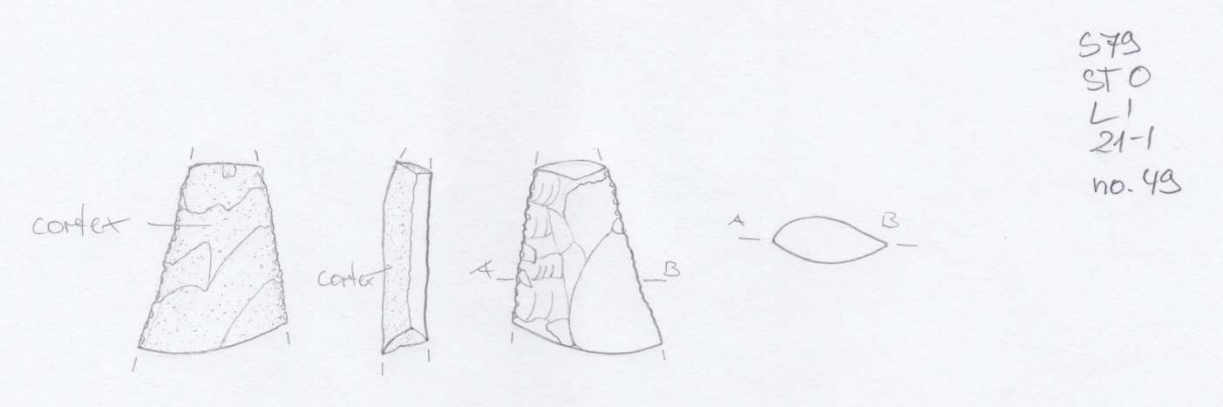

Figure 3.17 Drawing of arrowhead L1_F49. (Drawn by Rita Kremer-Langen, 2018).

3.2. Results

During and after the survey done by WAJAP in 2018 a preliminary report was already made about the sites and finds that were discovered during the season. In this report Düring already pointed out that he recognized around 8 complete retouched and mostly tanged arrowheads. Besides that some more fragmented arrowheads. He describes seeing fusiform and trihedral points.

When we compare the arrowheads found on Site 79 to the literature about arrowheads in Oman, mostly work by Charpentier, we can broadly confirm these claims.

I personally found it somewhat complicated to see the difference between trihedral and Fasad arrowheads at first. The fusiform type was easier to make out for me because their slenderness made them stand out to me clearly.

Table 3.1 contains all the finds from Site 79 that have been dated by comparing them to similar dated material. Mainly arrowheads were analysed because arrowheads have the most secure dating and connection to certain periods. Arrowheads can be useful as a 'diagnostic' of an assemblage. A part of the tools found by Pullar are also included. Lithic L2_F50 and L1_F49 have been left out of this table because there was no way to date them.

Excavation/survey	Lithic	Estimated period
Danish Archaeological Expedition (DAE)	Figure 2.9 no. 1. Fusiform point	4500-3700 BCE
DAE	Figure 2.9 no. 4. Trihedral point	7000-5500 BCE
DAE	Figure 2.9 no. 5. Trihedral point	7000-5500 BCE
WAJAP	L1_F53. Trihedral point	4500 BCE
WAJAP	L1_F50. Fusiform point	4500-3700 BCE
WAJAP	L1_F46. Fasad point, Faya type	9000-6000 BCE
WAJAP	L1_F52. Bifacial point	4000 BCE
WAJAP	L1_F47. Fasad point, Faya type	9000-6000 BCE
WAJAP	L1_F48. Barbed and tanged point	4000 BCE
WAJAP	L1_F55. Bifacial point	5500-4500 BCE
WAJAP	L1_F51. Bifacial foliate point	5500–4800 BCE
WAJAP	L2_F9. Borer	5000-4000 BCE
WAJAP	L1_F54. Barbed and tanged point	4000 BCE
WAJAP	L1_F56. Barbed and tanged point	4000 BCE

Table 3.1 Table of the lithic material from Site 79 with the associated periods. (Made by author)

The site has produced material dating from almost the entire span of the Neolithic period. However the Middle and Late Neolithic are more represented than the Early Neolithic. Almost every point could have been deposited in 4500 BCE except for the Fasad type arrowheads that were found. Since trihedral arrowheads still existed in later periods in the Neolithic they are not the most secure dating tool. It is possible that the site has only been used twice, once in the Early Neolithic and once in the Late Neolithic. However a more continuous use of the site can not be counted out either. The most likely possibility when looking at the fact that a range of arrowhead types are represented, Fasad, trihedral and fusiform, points to the site being in use more often.

Looking at the fact that to my knowledge a good part of the arrowheads found by the WAJAP team look unfinished or broken it may be the case that the site was a location for production or retouching of arrowheads. There has not been found a large amount of raw material at all and the source of raw material is unknown but likely not close. Only around 4 cores were found by the WAJAP team.

3.3. Conclusion

The thirteen finds collected as arrowheads by WAJAP in 2018 and the finds from the Danish Archaeological Expedition from the 1980s have been analysed and compared to the literature. The articles that were written about locations close to Site 79 were particularly useful. When there was a disagreement between sources I opted to go for the closer geographical comparison. Some of the arrowheads were difficult to recognize, potentially due to their unfinished nature. Because of the sometimes wide time periods that arrowheads have been attributed to there is substantial overlap in the ranges. This means that it is difficult to resolve a precise chronology of the occupation of the site. The most likely scenario is that the site has been in use multiple times during the Neolithic period. This is because arrowheads have been found likely originating from the Early, Middle and Late Neolithic.

4. Discussion

Introduction

The process of identifying the lithic assemblage at Site 79 and finding wider conclusions for the Neolithic in Oman turned out to be more complicated than originally thought. The learning curve in recognizing small varieties in characteristics of arrowheads made the analysis difficult. Here I will discuss if the research questions have been answered, either completely or partially, and I will evaluate the methodology that was used to study the material.

4.1. Archaeological interpretation

The data from the analysis suggest that the expectation at the beginning of the thesis about the use of the site over a long time period is true. Evidence from the Early, Middle and Late Neolithic have been found. The identification of the arrowheads with the help of geographically close sites helped immensely in establishing a chronology of the site. The dates of the arrowheads are for the largest part in the Late Neolithic which was slightly surprising. At first the data from the Danish Archaeological Expedition pointed more towards a Middle Neolithic assemblage however the material collected by WAJAP skewed more towards the Late Neolithic. However the small number of points drawn and included in the report from Pullar about the Danish Archaeological Expedition mean that this data may not be representative, the sample size is too small. That makes the material collected in 2018 essential for a more balanced view of the site.

The lithic material of course provides only a snapshot of the times the site has seen visitors. A large part of the assemblage could have been deposited in a short amount of time or it could have accumulated over a longer period. The results we have here can not answer that question.

The results build on the growing number of articles and books that have been written about the Neolithic period in Oman.

A limitation of the analysis is the fact that the morphological comparison of the lithic material is not a fool-proof way to date an assemblage. Nevertheless, I believe that the repeated confirmation of similarities between material based on solid research by others created solid results.

The results show that some of the arrowheads were likely unfinished or had some type of defect that made them unusable. One or two were in a stage where the tang still needed to be completely

defined and others seem to have been abandoned even earlier in the process. This supports the idea that the site was some kind of production location. Compared to other Neolithic sites in Oman that have been located until now the number of arrowheads on the surface at Site 79 is substantial. This also supports the idea of the finds being the leftovers from a workshop instead of it being a site where the arrowheads were only discarded.

If the site was a workshop, which the results of the analysis point to, then the reason for the large number of arrowheads found is clarified. They are discarded points that were not suitable for further knapping or use as an arrow.

4.2. Evaluation of methodology

The choice to compare the arrowpoints from Site 79 to the literature available about lithics from Neolithic Oman and Arabia was the most feasible option to establish a chronology of the site. However this also introduced some limitations because the published material about arrowheads in Oman is non-exhaustive and lacking secure dating for certain material. The wide time brackets that are the result of comparing the lithics to the literature mean that the results seem broad at first glance. But for this site where there has been no excavation of the potential Neolithic layer the method worked with what we had access to. It successfully established that the site has seen activity throughout the entire Neolithic period.

4.3. Conclusion

The data and analysis in this thesis have answered questions but also created new ones. The arrowheads tell us a remarkable amount of information about the site. The arrows date to almost the entire Neolithic. The research proves that the site was likely a lithic tool workshop in use during multiple different periods during the Neolithic. The idea that this site was a workshop would also explain the presence of the large number of arrowheads found at Site 79.

5. Conclusion

The assemblage of Site 79 is a remarkably varied one. This diversity of artefacts and length of deposition period gives us a small insight in the Middle and Late Neolithic transition period in northern Oman.

The first sub-question that was posited for this thesis, '*Which type of arrowheads and other chipped stones were found at Site 79 and in what stage of production are they'?* was answered. The diversity is visible in the very different characteristics of the arrowheads that were present in the assemblage. Tanged or untanged, trifacial or bifacial. Types of arrowheads that were found are Fasad, trihedral, fusiform and bifacial arrowheads. A good number of the arrowheads were retouched. Around 7 complete and tanged arrowheads. The material that the arrowpoints were made of varies in quality and colour. We also found some other retouched tools. A lot of them seem to be broken or unfinished.

The second sub-question, '*To which time period do the arrowheads found at Site 79 date and what chronology does this create'?* has been answered by this research. The Fasad, Trihedral and Fusiform types of arrowheads that were present in the assemblage here create a chronology of sorts. Where even though we do not have an excavated site, we can say something about the usage of the site. This location was by looking at the arrowheads found, in some kind of use in the Early, Middle and Late Neolithic. This is a large period of time spanning from 8000 to 3700 BCE attested to by the artefacts.

The third sub-question, which was *'What type of site was Site 79'?* has been partially answered by this research. Site 79 looks to be some kind of production site for lithic tools. The arrowpoints in various stages of production ranging from just starting out to almost finished, broken material, a range of materials and other aspects. This points to people experimenting with different techniques or people learning from others or from success and failure how to create the desired results. The site does not contain a source for the lithic material as far as we know, so the material had to be transported here.

The fourth sub-question was: '*What is the reason for the large number of arrowheads left at Site 79'?* The answer to this question builds upon the answer to the third sub-question. The reason for the large number of arrowheads left at Site 79 for us to observe now is likely because it was a production site. If the site was some kind of production site, maybe some of the arrowheads that

were found had defects and thus they got tossed away and ended up in the archaeological assemblage. The arrowheads need to be studied more closely to confirm this theory.

These sub-question help to answer the main research question which was: *What can the finds of Site 79 tell us and what knowledge does the site add to our understanding of the Neolithic period in the Batinah province of northern Oman?*'

The finds from this site demonstrate that they can give us a lot of information about the Neolithic period. They clarified the chronology of the site and thereby helped to expand our knowledge about the Neolithic and the place this site takes in that period. It shows that lithic tool production likely occurred in some type of workshop along the coast. It also shows that despite the fact that Neolithic sites can be hard to locate in northern Oman, it is worth the effort it takes to find them.

5.1. Future possibilities of research

Site 79 has sadly been extensively influenced by modern disturbances. The ideal solution would be a rescue excavation of everything that is left at this point in time. An excavation might be able to give us a stratigraphy for this location which would be a huge help in confidently establishing the chronology and use of the site.

The research methods employed in this thesis are not as extensive as what would be ideal in this situation. Access to the real arrowheads, which are currently located in Oman, would have likely helped with their identification.

Influence of the reservoir effect on the chronologies of the material is still not completely clear in Oman. So, clarifying this would strengthen the accuracy of the results.

In the future it would help to have more sites with stratigraphical layers excavated. Because while Site 79 has arrowheads representing multiple periods, we have no undisturbed context or secure dating. The arrowhead chronologies made by Vincent Charpentier are detailed and useful but may not look the same throughout the entirety of Oman. An airtight stratigraphy and more research into the Neolithic of Oman will solidify the conclusion of this thesis.

Abstract

Site 79 is a location where multiple archaeological activities have taken place over the last couple of decades. It is located in northern Oman, specifically in the Al Batinah province, inside the current city of Sohar. The site contained archaeological finds and features from multiple different periods. This thesis focuses on the lithic material from the Neolithic period that has been found at the site. This includes material from a recent surface collection in 2018 but also material that has been found there in the past.

This thesis explores the different lithic industries from the Neolithic period of Oman and aims to determine the periods that are represented by the material at Site 79. This is done by comparing the material that was found to dated material from comparable sites located in Oman and the United Arab Emirates. The analysis of the lithic material found at Site 79 by comparing it to dated material in the literature showed that there is material from the Early, Middle and Late Neolithic. This is because types of arrowheads can be connected to time periods in which they were mainly produced. At the site there were multiple lithic facies identified. Among them were Fasad arrowheads, trihedral arrowheads, and fusiform arrowheads. A majority of the material that could be tentatively dated pointed to the Late Neolithic, however there is enough material from earlier periods to prove that the site must have been in use more than once. Looking at the unfinished or seemingly broken nature of most of the arrowheads the site was probably a lithic workshop. This would also explain the relatively large assemblage of lithics that was found at the site compared to other Neolithic sites in Oman.

The research presented here adds to a growing body of evidence on the Neolithic period of Oman and increases our knowledge about the characteristics of this period in Oman.

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