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The 2018 Archaeological Survey at Tawi Said, Sultanate of Oman

Stephanie Döpper, Irini Biezeveld,
Maria Pia Maiorano and Jonas Kluge

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Summertown Pavilion
18-24 Middle Way
Oxford OX2 7LG
England

Cover illustration: Sherd of a Wadi Suq pottery vessel found at Tawi Said.

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1 Introduction (Stephanie Döpper)

1.1 Location

Tawi Said is situated at the eastern fringe of the Wadi Batha, directly opposite the northern limits of the Sharqiyah (Wahiba) desert, approximately 5 km to the northwest of the modern city Bidiyah/Al-Mintarib and 2.5 km southeast of Al-Wasil (WSG 84 UTM zone 40N, 681779 E, 2485846 N, Fig. 1). Thus, it lies at the margin of the open drought-deciduous xeromorphic woodlands of northern Oman and the sandy desert.[1] The woodland is characterised by trees such as *Acacia tortilis*, *Ziziphus spina-christi*, *Prosopis cineraria* and *Maerua crassifolia* and the presence of annuals and grasses that emerge after rainfall. In the Sharqiyah Sands, longitudinal dune ridges of aeolian orange-red sand up to 100 m in height separated by interdune valleys with gravel characterise the landscape. Woodlands are absent here, with the exception of a few stands of *Prosopis cineraria* and the flora is generally dominated by Saharo-Arabian species.

The region of Tawi Said has received on average 81 mm of rainfall over the last ten years with a maximum annual rainfall of 139 mm in 2013 and a minimum rainfall of only 1 mm in 2018, demonstrating the large range of interannual variability.[2] The name *ṭawī* indicates that it a place where a natural depression facilitated the construction of a large well.[3] Such depressions were frequently visited by camel herding Bedouins.[4] Other than small domestic wells (*bi'r*), large wells were meant to produce large and continuous amounts of water and were therefore animal powered (*zajara*). Al-Mintarib in the vicinity of Tawi Said is one in a chain of marketplaces from the coast to the interior along the southern edge of the Hajar Mountains, where villagers sell agricultural produce, dates, fruit, vegetables and cloth, and Bedouin groups traded with products of animal husbandry, salt, firewood, charcoal, rugs and bags as well as dried fish.[5] This adds another point of interest to the location of Tawi Said.

The area of archaeological significance in Tawi Said sits directly north to the slopes of the Wadi Batha, in an area of low sand dunes, grasses and scrub (Fig. 2). Wind erosion formed the hard surface with small to fist-sized stones, removing the lighter particles such as sand. This has led to a concentration of heavy particles like stones but also archaeological finds on the surface. This process is typical for arid areas such as central Oman. In the northeast and southwest, this area is bordered by modern car tracks, while in the north, it becomes sandier. To the east, the area runs into two shallow sand dunes of ochre-coloured sand with small to fist-sized stones on the surface (Fig. 3), and to the west into another cluster of smaller sand dunes, which are overgrown with trees and shrubs. To the south it ends at the edge of the wadi (Fig. 4 and Fig. 5). The wadi has dug itself several metres deep into the landscape (Fig. 6). Its bed is characterised by very fine sand that is black on the surface and ochre-coloured underneath.

1.2 Research history

Beatrice de Cardi discovered Tawi Said in 1976 when she was looking for the third millennium BCE remains of Tawi Hulays,[6] returning in 1978 for a short field season, including intensive survey and excavations. The survey revealed much Early, Middle and Late Islamic pottery as well as at least three concentrations of Wadi Suq period sherds.[7] Other finds from the survey included soft-stone vessel fragments and worked flints. The Royal Oman Police assisted de Cardi by flying over the area so that she could get an impression from the air. This revealed outlines of two mud-brick platforms connected to each other by two parallel walls (Fig. 9). The walls were about 1 m thick and 2.5 m apart from each other. They were extremely weathered and only preserved 2–3 cm above

1 Patzelt 2015: 291–293.
2 https://www.worldweatheronline.com/ibra-weather-averages/ash-sharqiyah/om.aspx.
3 Scholz 1977: 101; Costa 1991: 245.
4 Thesiger 1950: 151.
5 Scholz 1977: 112 Abb. 3; Wilkinson 1987: 37.
6 De Cardi 1977: 61.
7 De Cardi – Bell – Starling 1979: 85.

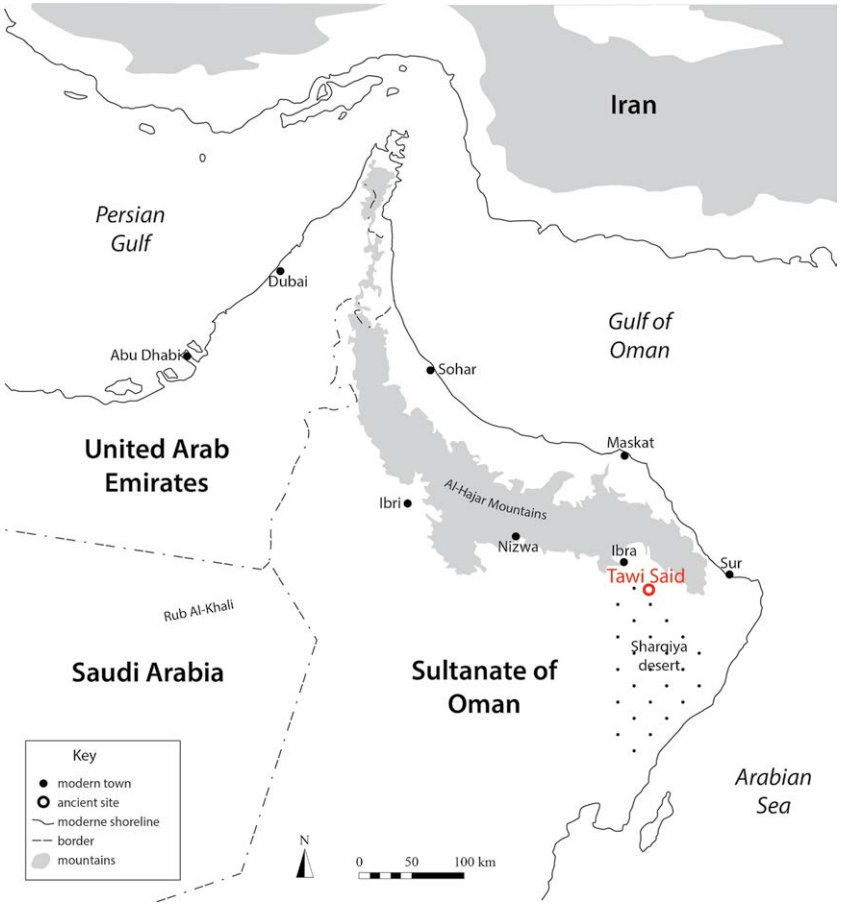

Fig. 1: Location of Tawi Said in central Oman.

Fig. 2: Grasses and scrub at Tawi Said.

Fig. 3: Low sand dune at Tawi Said.

surface, from which they differed by their lighter colour and denser consistence (Fig. 7). No pottery was found in direct association with this structure, but some Wadi Suq period material was found to its northwest. None of de Cardi's walls were rediscovered during the 2018 survey, but patches of light-coloured soil were present that might have been mistaken for walls (Fig. 8). Alternatively, de Cardi's walls were simply no longer preserved.

De Cardi excavated five small trenches (Fig. 9), whose exact location could not be reconstructed during our work in 2018. Trench TSD1, measuring 2 x 5 m, was laid out covering part of the two mud-brick walls and the western part of the mud-brick platforms.[8] It was excavated to a depth of 30 cm and featured only sterile sand. The second trench, TSD2, lies about 8 m east of TSD1 in the vicinity of a pottery scatter and measures 1 x 2 m. It was excavated to a depth of 40 cm and again yielded only sterile sand. Trenches TSD3 and TSD5 are located about 40 m northwest and 30 m northeast of TSD2, again in areas of pottery concentrations.[9] Within these, no evidence for human occupation was encountered. Trench TSD4

8 De Cardi – Bell – Starling 1979: 86.
9 De Cardi – Bell – Starling 1979: 86.

Fig. 4: Tawi Said with Wadi Batha and the sand dunes of the Sharqiyah Sands in the background.

Fig. 5: Aerial view of Tawi Said with Wadi Batha and the sand dunes of the Sharqiyah Sands on the right and the oasis of Al-Mintarib in the background.

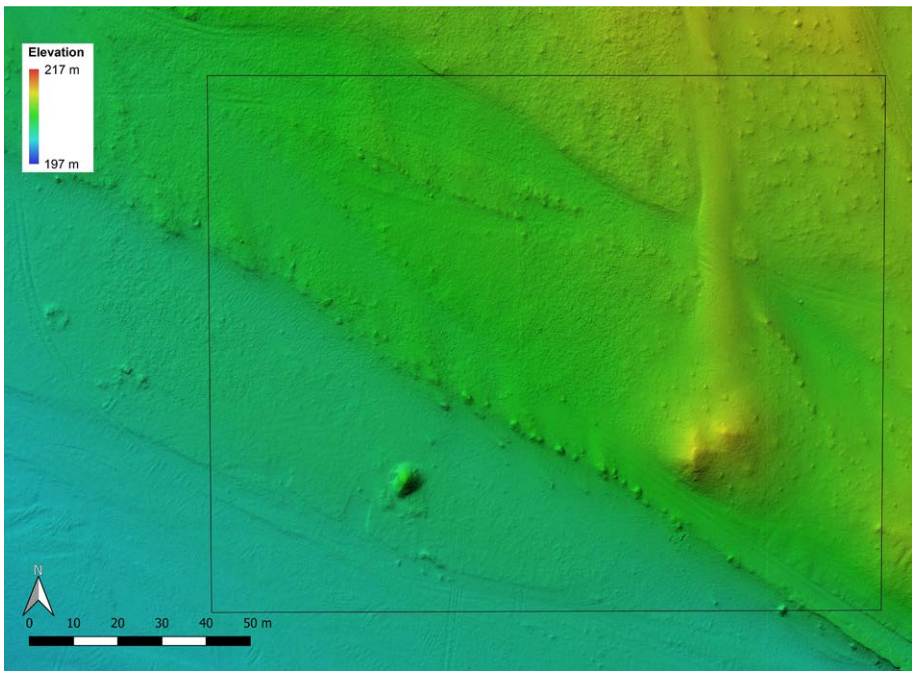

Fig. 6: DSM of Tawi Said.

Fig. 7: Mud-brick walls from de Cardi's excavations in 1978 (de Cardi – Bell – Starling 1979: pl. 36).

Fig. 8: Patches of light-coloured soil.

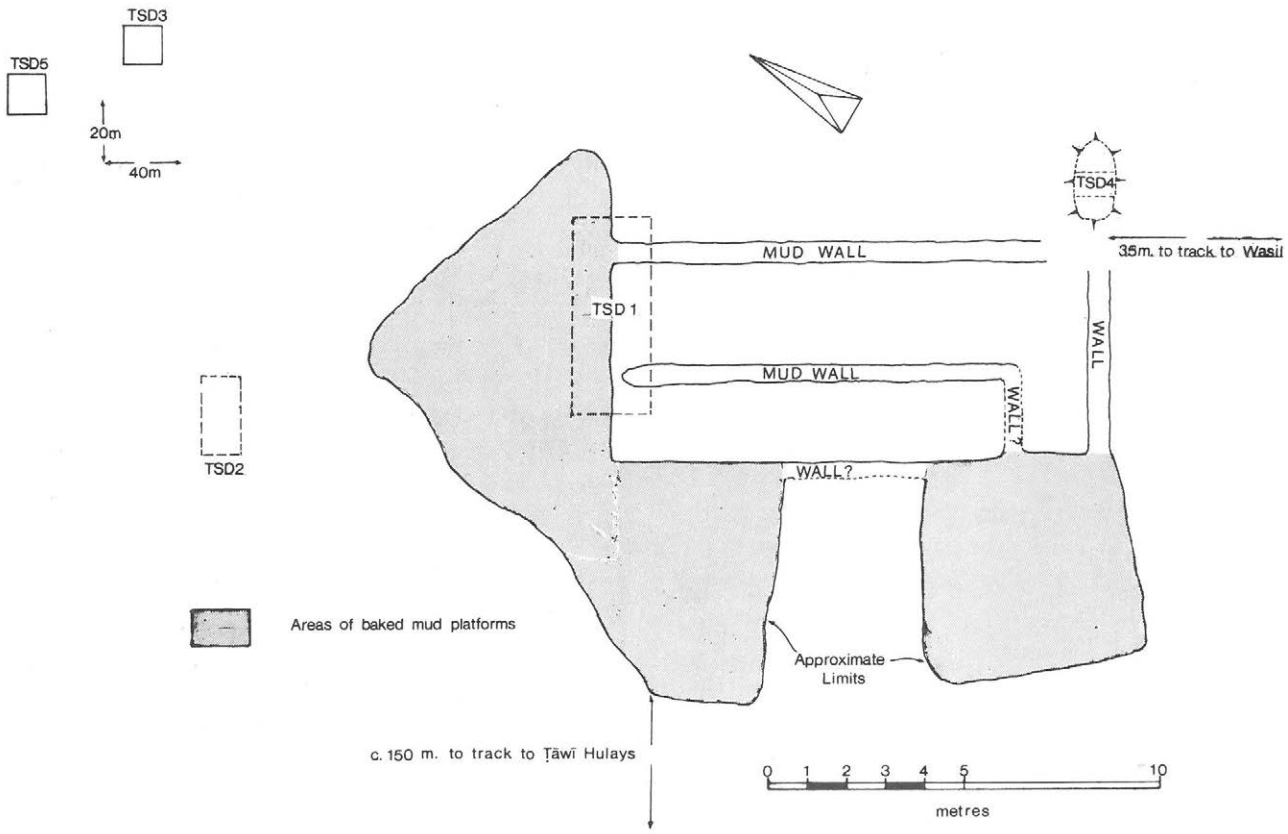

Fig. 9: De Cardi's plan of the mud-brick structures (de Cardi – Bell – Starling 1979: 85 fig. 10).

corresponds to a shallow mound standing 10 cm above ground level at the northeastern end of the mud-brick structure. Within this 1 x 2 m large area, burnt stones were identified on the natural sand forming a hearth.[10] It also yielded seven Early/Middle Islamic pottery sherds. As her trenches "failed to reveal any depth of occupation" de Cardi stopped her work at the site.[11] Nevertheless, ever since then, Tawi Said has featured prominently in the literature as the first discovered and so far only Wadi Suq period settlement site in the interior of Oman.[12]

1.3 The 2018 survey

In November 2018, a team from the Goethe University Frankfurt returned to the site to gain insights into the nature of the site, its chronological range and the activities that can be identified for the different periods. This included the question of where the occupation of Tawi Said can be dated to within the Wadi Suq and Islamic periods. The field season lasted from 10 November to 3 December 2018, whereby the first seven days were spent at the site and during the other two weeks the finds were processed. The five participants of the survey included Dr Stephanie Döpper, Dr Conrad Schmidt, Nick Kirchhoff, Jonas Kluge and Samantha Petrella. Financial support for the fieldwork was provided by the *Deutsche Orientgesellschaft*.

The survey area was systematically field walked in straight north–south lines. Each person was spaced at 1.5 m distance to ensure complete visual coverage of the surface.[13] In total, an area of 150 x 125 m was examined this way (Fig. 10). Each object found during the survey was given an ascending number, measured with a portable GPS device (Garmin eTrex 10), and collected for further processing. In total, 8,611 artefacts were registered during the Tawi Said survey, including 6,750 pottery sherds, 544 seashell fragments, 336 lithic artefacts, 225 metal objects including slag and copper prills, 48 pieces of personal adornment and two stamp seals.

Finds were scattered over the entire survey area in large quantities except for the wadi and the low sand dune in its east. Here, only isolated pottery sherds were encountered. Towards the east the finds generally thin out slowly, while the find quantities continue in a similar pattern to the north and west outside the survey area, demonstrating that the archaeological site is much larger

10 De Cardi – Bell – Starling 1979: 86.
11 De Cardi – Bell – Starling 1979: 61.
12 Carter 1997: 56–67.
13 Cherry *et al.* 1991: 20.

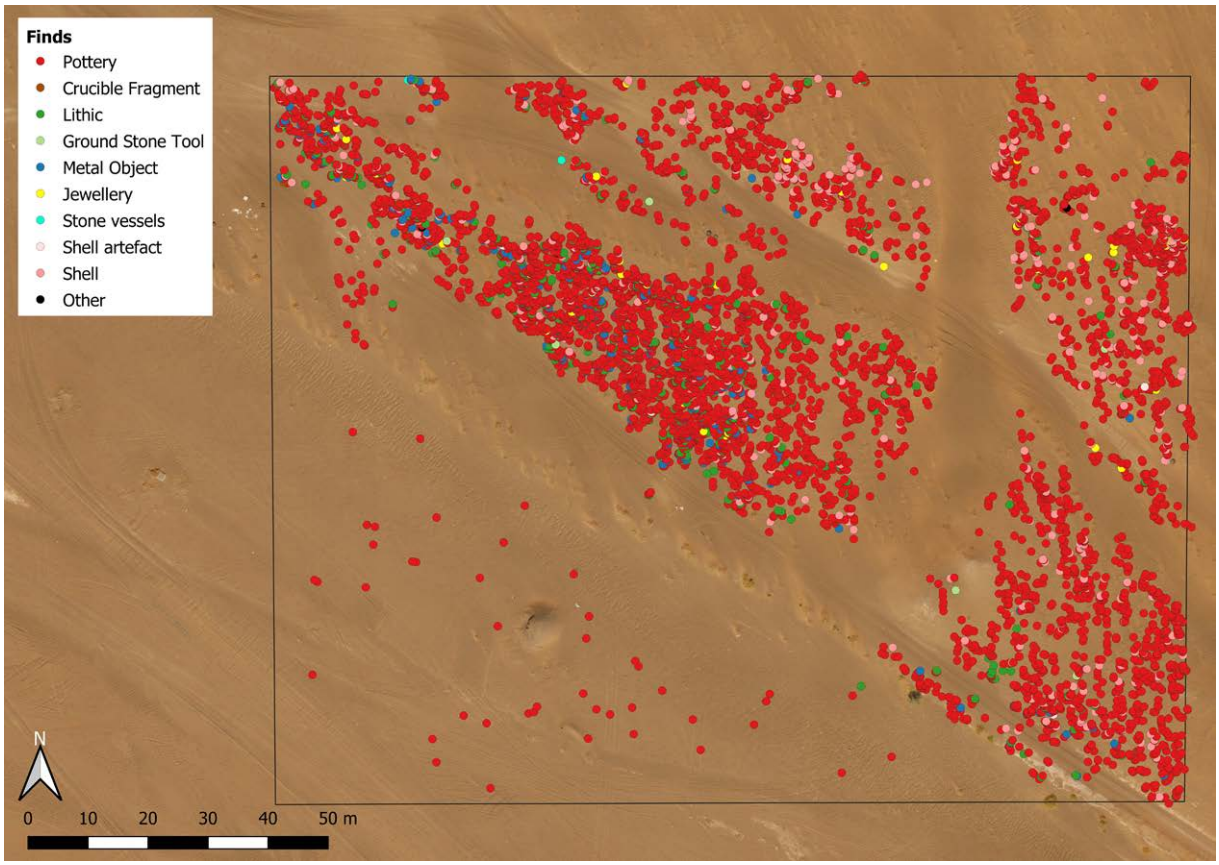

Fig. 10: Survey area in Tawi Said with distribution of finds.

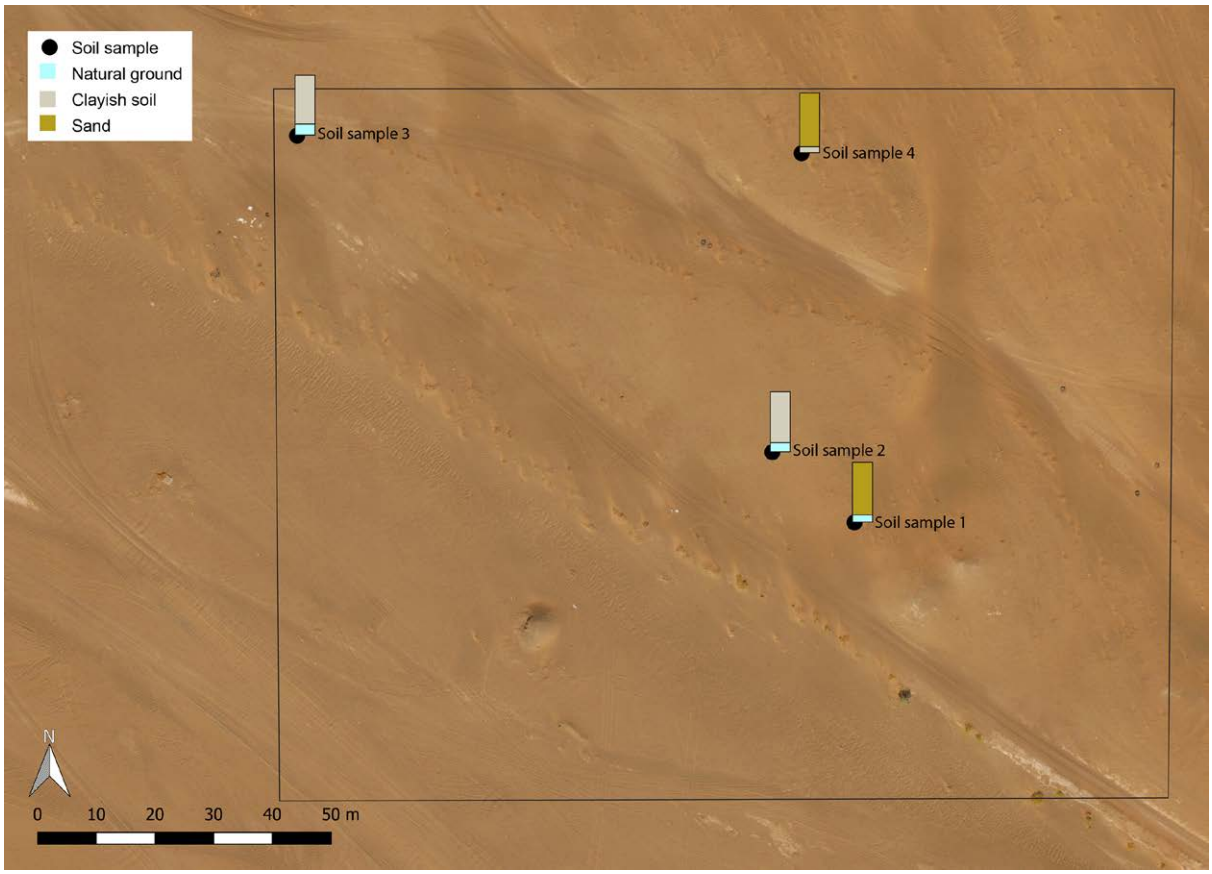

Fig. 11: Soil sample locations at Tawi Said.

than the surveyed area. The densest concentration of finds is directly west of the sand dune in the centre of the survey area. The small, very intensive find concentration in the northeast can be explained by the fact that here a whole vessel was found broken into numerous fragments, whereby each fragment received its own number and was evaluated individually in the distribution of finds.

Additionally, four soil samples were conducted in the survey area with a hand-powered earth auger to get an impression of the depth of accumulation (Fig. 11). Soil sample 1 on the sand dune in the southeastern part of the survey area displayed 74 cm of fine, soft sand before reaching a more compact, light beige coloured material with nearly no inclusions. In soil sample 2, situated approximately 18 m to the northwest of drilling 1, no sand was present. Instead, the upper 57 cm were made of the same compact, light beige coloured material as found in drilling 1. Below, the natural soil was reached. This is whitish in colour, rough and hard. Soil sample 3 was conducted at the northwestern corner of the survey area. The sequence of material is similar to soil sample 2. In the upper 44 cm, the light beige coloured material was found. Below, there is natural soil. In soil sample 4 in the northern part of the survey area, the upper 89 cm comprises fine sand. This is followed, as in soil sample 1, by the light beige coloured material. Thus, in those parts of the survey area that are not covered by sand dunes, natural soil was reached after 57 to 75 cm, giving a promising depth for potential anthropogenic layers at the site.

2 The Pottery (Irini Biezeveld & Stephanie Döpper)

The pottery from Tawi Said has been studied based on the methodology published by Schmidt.[14] This methodology describes the individual pottery sherds through the combinations of single characteristics. All sherds that were collected during the survey were assigned a ceramic ware type. The main criteria for the definition of a ceramic ware are the inclusions, the surface finish and the colour. After this, the sherds were divided into diagnostic sherds and undecorated body sherds. The body sherds were only assigned a ceramic ware type, but the diagnostic sherds (rims, bases, handles, spouts and decorated body sherds) were described in more detail by defining their technological and decorative characteristics. When possible, the rims and base sherds, as well as the handles and the spouts, were given a vessel type (i.e., bowls, cups, beakers, pots) and were assigned to a specific formtype. A formtype classifies the characteristics of the shape of the vessel, as far as can be told from the sherd. This is based on the anatomic division of a ceramic vessel; the rim, neck, shoulder, body, lower body, base and foot, where the definition of the form typology goes from top to bottom. The combination of the ceramic ware and the formtype results in the ware-formtype.

2.1 Type and scope of the studied material

From the 2018 survey at Tawi Said, a total of 6,753 sherds were collected. From these sherds, 1,789 are diagnostic and 4,964 sherds are undecorated body sherds. The sherds were mainly concentrated at the centre and the north-eastern corner of the survey area (Fig. 12 and Fig. 13). A detailed description of the different ceramic wares, form-types, chronological and spatial distribution follows below.

2.2 The ware typology

The ceramic wares are defined based on a combination of different characteristics, as described by Schmidt. A total of 24 different ceramic wares can be recognised within this dataset (Fig. 14).

Fine and medium-coarse wares with mineral inclusions:

Ware 10: Fine, red to light red, (almost) untempered ware
Ware 11: Fine, low to medium tempered quartz ware
Ware 13: Medium-coarse, mineral-rich ware
Ware 14: Medium-coarse, low tempered ware with light yellow inclusions
Ware 20: Fine, mineral-tempered ware with black painting on a red background (black on red ware)
Ware 21: Fine, mineral-tempered ware, with black painting on a yellowish-beige to pale brown background
Ware 22: Fine, mineral-tempered, beige to reddish ware with black painting on a grey background
Ware 24: Fine, mineral-tempered ware with pink painting
Ware 25: Mineral-tempered ware with brown/black painting on a brown background

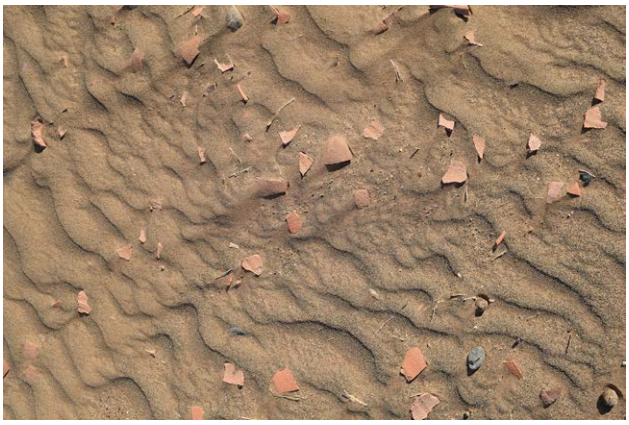

Fig. 12: Pottery sherds at Tawi Said.

14 Schmidt 2020: 18–34.

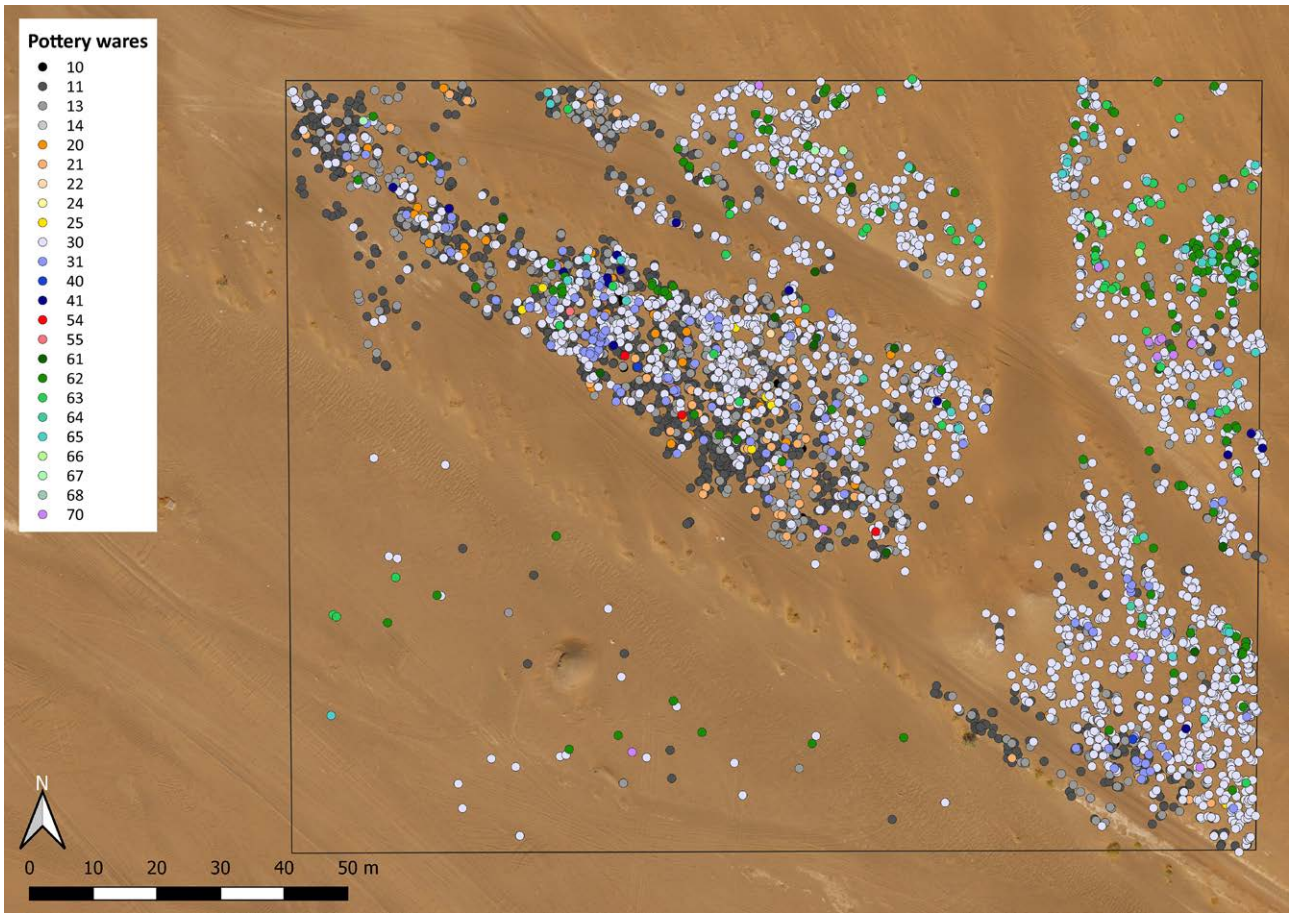

Fig. 13: Distribution of the ceramic wares at the Tawi Said survey area.

Coarse, mineral-tempered wares:

Ware 30: Coarse, mineral-tempered ware
Ware 31: Coarse, mineral-tempered, handmade ware

Chaff-tempered wares:

Ware 40: Low to medium chaff- and mineral-tempered ware
Ware 41: Medium to high chaff-tempered ware

Grey wares:

Ware 54: Mineral-tempered, grey, painted ware
Ware 55: Mineral-tempered, grey, incised ware

Glazed wares:

Ware 61: Black glazed ware
Ware 62: Yellow-green glazed ware with black dots (Bahla Ware)
Ware 63: Yellow-green glazed ware (Bahla Ware)
Ware 64: Turquoise glazed ware
Ware 65: (Dark) green glazed ware
Ware 66: Grey-green glazed ware
Ware 67: Incised green glazed ware (Sgraffiato)
Ware 68: Beige porcelain (teacup)

Comb-incised wares:

Ware 70: Comb-incised in varying directions

2.2.1 The technological features of the ceramic wares

Each of the aforementioned ceramic wares have their own characteristic features, which will be highlighted in this section. Additionally, the statistics for the Tawi Said assemblage will be noted, to give the reader an idea of how well represented these ceramic wares are in the overall assemblage.

For **ware 10**, a total of 30 sherds are documented, of which seven are diagnostic, and 23 are undecorated body sherds. The diagnostic sherds consist of two rims, two bases and three body sherds. The two rims are documented as 'misfired', in contrast with the other sherds. For all the diagnostic sherds, the main inclusions are fine quartz (sand) which occurs often in the fabric. No other inclusions are noted. The surface finish on the exterior of the sherds is for two of the sherds clay-based, and one sherd has a covering slip. For the interior surface finish, one other sherd has a covering slip, where there was nothing

noticeable for the other six sherds. The surface treatment on the interior and exterior is unremarkable for all the sherds. The colour of the sherds on the interior and exterior as well as the colour of the matrix is mainly light red. Buff tones as well as dark grey/black are also present. The sherds are, when it can be determined, wheel-made, and in 75 % of the cases, narrow, shallow tracing marks could be distinguished. The surface of three sherds is completely painted in dark grey/black.

Ware 11 consists of 2,387 sherds that have been collected during the survey. Of these, 1,972 are undecorated body sherds and 415 are diagnostic sherds. The diagnostic sherds can be subdivided into 257 body sherds, 84 rims, 69 bases, one handle, three spouts and one complete profile. Most of the sherds (n = 387) show no special firing, 26 were fired inconsistently and one sherd has been misfired. The main inclusions are fine quartz (sand), which occurs in 97.8 % of the sherds. Other main inclusions are large quartz granules (gravel) and lime. Secondary inclusions are recorded in 9.4 % of the cases, consisting of the previously mentioned inclusions, plus mica. The surface finish is in most cases a covering slip on the exterior, as can be seen at 61.9 % of the sherds. 1.2 % of the sherds have a self-slip on the exterior and 1.2 % of the sherds have a self-slip on the interior. On one sherd, the exterior is covered with sintered lime and on another sherd, the interior is covered with sintered lime. The others, 33.3 %, have a clay-based surface treatment on both the exterior and interior. One sherd is documented as having a polished exterior surface treatment, and for the other sherds there was nothing remarkable to notice in this aspect. The colouring of the sherds was varied, from red and brown tones to some grey, beige and yellow tones. The fabric contains mainly reddish tones, as well as yellow, brown and greyish tones. One sherd, the handle, is noted as being handmade, four as not recognisable and all the others as being wheel-made. On 14 % of the sherds, narrow, shallow tracing marks could be distinguished. On one sherd, deep tracing marks are present. Two sherds show evidence of spiral markings at the base on the interior, and one on the exterior. One sherd also shows evidence of spiral markings at the interior, as well as a string-cut. There is also one sherd that shows use wear traces. The decoration, if present, consists mainly of completely painted surfaces in grey or beige. This beige decoration was also noted by de Cardi.[15] Additionally, there are some decoration techniques that are sparsely used, like an incised horizontal or vertical line, an incised wave pattern, horizontal comb incisions and a straight ridge. Three sherds have a hole, one has a subsequently added hole, one has sieving holes, and one sherd is a pierced lug handle.

A total of 919 sherds are documented as **ware 13**. These are 751 undecorated body sherds and 168 are diagnostic sherds. Most of the diagnostic sherds are body sherds (n = 116). 27 rims, 20 bases, one handle, three spouts and one complete profile make up the remainder of the diagnostic sherds. Regarding the firing, most of the sherds indicate no peculiarities, except for 13 sherds that have been fired inconsistently. 53.6 % of the sherds have large quartz granules (gravel) as their main inclusions, in 44.6 % of the sherds this is fine quartz (sand), and in 1.8 % this is lime. Secondary inclusions are noted in 67.9 % of the cases, which all consists of the previously mentioned inclusions except for lime. The surface finish on the exterior in 64.3 % of the sherds is a covering slip. 2.3 % of the sherds have a self-slip on the exterior and the remainder have a clay-based exterior surface finish. 20.2 % of the sherds have a covering slip or a self-slip on the interior. The colour of the sherds varies from reddish, black and brown tones to a few yellow, beige and grey tones. The colour of the fabric is also varied, containing mainly reddish and brown colours, but yellow, grey and beige tones also occur. Two sherds are noted as being handmade, eight as not recognisable and all the others as being wheel-made. At 8.3 % of the sherds, narrow, shallow tracing marks could be distinguished. On one sherd, spiral markings at the base on the interior are present. The decoration in 75 % of the cases consists of painting on the surface, mainly in grey. Most of these sherds have a completely painted surface. Other decoration techniques contain painted geometric motifs, comb incisions and incised lines. Two sherds have holes, one has a subsequently added hole, two sherds feature a vertical loop handle, and one sherd a spout.

Ware 14 is represented in the Tawi Said assemblage by a total of 25 sherds. 18 of these are undecorated body sherds, four are decorated body sherds, one is a rim sherd, one a base and one a vertical loop handle. No peculiarities could be distinguished regarding the firing of these sherds. The main inclusions are fine quartz (sand), which is present in 57.1 % of the sherds. The other sherds have large quartz granules (gravel) as main inclusions. 42.9 % of the sherds have secondary inclusions, which also include large granules and fine quartz. One sherd has a covering slip on the exterior surface, and the other sherds have a clay-based surface finish on the interior and the exterior. The sherds have almost all red-brown or red-beige tones, except for one, which has a beige coloured exterior. The fabric is also either red-brown, as with the vast majority, or red-beige in colour. Two sherds are handmade, and the other five are wheel-made. On one sherd, narrow, shallow tracing marks could be distinguished. The decoration of the sherds consists mainly of comb-incised decoration (n = 3), fingernail impressions (n = 1) or a beige coloured surface (n = 1).

15 De Cardi 1977: 61.

56 sherds are documented as **ware 20**. This ware was also recognised by de Cardi, during her initial survey in 1976 and the excavations in 1977.[16] These are all diagnostic; 38 are decorated body sherds, 17 are rims and one is a base. Only two sherds are noted as being fired inconsistently, and the other sherds have no peculiarities. 53 of the sherds have fine quartz (sand) as their main inclusions, and the other three sherds have larger quartz granules (gravel) present. Two sherds have quartz also as their secondary inclusions and one has evidence of

16 De Cardi 1977: 47; de Cardi *et al.* 1979: 86.

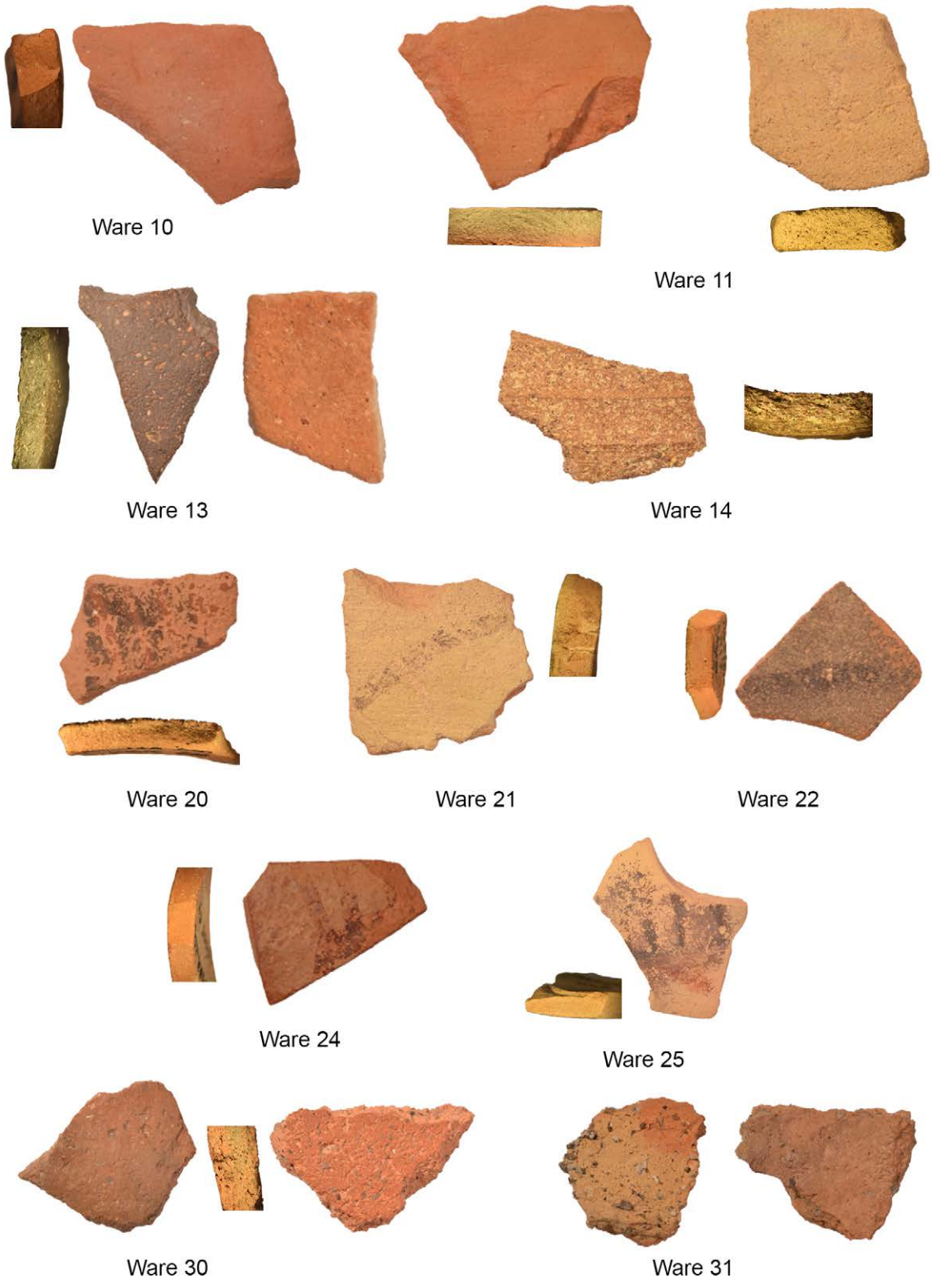

Fig. 14: Ceramic wares from Tawi Said.

mica. On 57.1 % of the sherds, a covering slip is present on the exterior surface, two sherds have a self-slip on the exterior, and 22 sherds have a clay-based surface finish. Most of the sherds are reddish coloured, and some are brownish. The fabric of the sherds is also mainly reddish, but yellow, brown and grey also occur. All the sherds are noted to be wheel-made. On 14 sherds, narrow, shallow tracing marks are evident, and on one sherd there is evidence for deeper tracing marks. All the sherds have painted decoration; these are mainly black lines.

Fig. 14: Ceramic wares from Tawi Said.

Of **ware 21**, 80 sherds are documented at Tawi Said. These are also all diagnostic; 74 are painted body sherds and six are rims. Five sherds have been fired inconsistently, and concerning the firing of the other sherds there are no peculiarities. Almost all sherds (n = 78) have fine quartz as their main inclusions, where one sherd has large quartz granules and one sherd has lime as main inclusions. Only five sherds have secondary inclusions, which are organic material, large quartz granules and lime. 80.0 % of the sherds have a covering slip on the exterior, but only 6.3 % of the sherds have a covering slip on the interior. The colour of the sherds is mainly beige or yellow, but some reddish tones also occur. The fabric is also mainly beige, yellow, or light red. The sherds are wheel-made and in 15 % of the cases, narrow, shallow tracing marks are present. All sherds have traces of paint on the surface in a dark brown or black colour. The most common patterns are horizontal lines, arches, or a combination of the two. A similar ware was mentioned at de Cardi's excavation of Tawi Said.[17]

Ware 22 consists of one sherd in this dataset. This is a decorated body sherd with no specific type of firing. The main type of inclusions are fine quartz. The surface treatment of the interior is clay-based and there is evidence for a covering slip on the exterior surface. The colour of the sherd is reddish-beige. The fabric is coloured light red. The sherd is wheel-made and does not show any signs of the manufacturing process. The sherd has dark grey painted arches.

One sherd is documented as **ware 24**. This is a decorated body sherd with fine quartz as its main inclusions and no secondary inclusions. The exterior surface of the sherd has been finished with a covering slip. The sherd, including the fabric, has a light red colour. It was wheel-made, with no further signs of the manufacturing processes. The sherd is decorated in dark red paint with diagonal lines.

Eleven sherds have been categorised as **ware 25**, of which nine are decorated body sherds. One is a rim and one is a base. One sherd has been fired inconsistently, and the other sherds have no peculiarities. Fine quartz is noted as the main inclusion in ten of the sherds, whereas large quartz granules are present as the main inclusion in one sherd. The secondary inclusions contain large quartz granules in one sherd, and fine quartz in another. Almost all sherds have covering slip as a surface finish. Three sherds have this slip both on the interior as well as on the exterior, seven sherds have the slip only on the exterior, and one sherd has evidence of a self-slip on the exterior. The colour of the sherds varies in most cases from light to dark brown. The fabric is also mainly light brown, but tones of light red and yellowish-beige are also present. All the sherds are wheel-made, without any additional signs of the manufacture process. All the sherds have dark grey to black painted decoration. The decoration consists mainly of one or more lines. This ware was also mentioned in previous excavations of the site.[18]

For **ware 30**, a total of 2,805 sherds are documented. Of these, 2,086 are undecorated body sherds, 485 are diagnostic body sherds, 173 are rim sherds, 58 are bases and three sherds are handles. 4.2 % of the sherds have been fired inconsistently, one sherd shows evidence for secondary firing and the remainder of the sherds do not show any peculiarities. The inclusions consist mainly of large quartz granules, specifically in 98.5 % of the sherds. 1.4 % of the sherds have fine quartz as their main inclusions, and one sherd has organic material as its main inclusion. The secondary inclusions are again fine and large quartz granules, as well as lime in a few cases. Most of the sherds, 74.9 %, have a covering slip on the exterior surface. A self-slip also occurs, but only in 2.9 % of the sherds. Two sherds have an exterior surface that is covered in lime-sinter, and one sherd has a glazed surface on the exterior. 19.2 % of the sherds have a covering slip on the interior surface, and 5.4 % of the sherds have an interior surface that is covered in a self-slip. Seven sherds have smudges on the interior surface and two on the exterior surface. The colouring of the sherds is mainly reddish or brown, but there are also examples of grey-coloured sherds. The fabric colour varies from red to buff, beige and brown. Some grey fabrics are also present. Most of the sherds are wheel-made, specifically 95.4 %. 20.3 % of the sherds have narrow, shallow tracing marks, where on one sherd, there is evidence for deeper tracing marks and on another sherd there is evidence for oblique to vertical tracing marks. One sherd shows traces of secondary use. 76.5 % of the sherds have painted decoration on the surface. In almost all cases, the complete surface has been painted. The colour of paint is mainly reddish, brownish or dark grey/black. A few sherds are decorated with incised bands and/or a ridge. One sherd contains a hole, two sherds contain holes that have been added later, three sherds have a vertical loop handle and three sherds have a perforated lug handle.

Ware 31 consists of 128 sherds, of which 99 are undecorated body sherds, 24 are rim sherds, three are base fragments, one is a decorated body sherd and one is a handle. Regarding the firing, four sherds are noted to have been fired on a very low temperature or to have not been fired at all. The remainder of the sherds show no peculiarities. The main inclusions are large quartz granules, which is

17 De Cardi *et al.* 1979: 86.

18 De Cardi *et al.* 1979: 86.

present in 86.2 % of the sherds. The remainder of the sherds have organic temper as their main inclusions. As secondary inclusions, 41.4 % of the sherds have fine quartz in their matrix. For the other sherds, no secondary inclusions are noted. 13.8 % of the sherds have a covering slip on the exterior surface and one sherd also has a covering slip on the interior surface. The colour of the sherds is mainly reddish, but also tones of yellow, beige and brown are present. The fabric colour varies from reddish to yellow, brown or grey. The sherds are all handmade, except for two sherds, where the manufacture could not be determined. Three sherds have a completely painted surface, two in red and one in dark brown. One sherd has comb-incised impressions.

Two sherds are documented as **ware 40**. One is an undecorated body sherd, the other is a base fragment. The base fragment has organic temper as its main inclusions and large quartz granules as its secondary inclusions. The exterior surface of the sherd has been finished with a covering slip, and the interior surface of the sherd is not preserved. The sherd is dark brown and the fabric is grey-beige and light brown. The sherd was wheel-made.

Ware 41 consists of 15 sherds. 13 of these are undecorated body sherds, one is a rim and one is a base fragment. One of these sherds was fired at a very low temperature or has not been fired at all. The main inclusions in both sherds are organic temper, and there is no evidence for secondary inclusions. There are no peculiarities regarding the surface finishing, and both sherds have a clay-based finish. The colour of the sherds is beige and light brown, and the colour of the fabric is the same. One of the sherds is noted to have been made on the potter's wheel. There is no decoration on these sherds.

For **ware 54**, three sherds are documented. One is a rim fragment and two are decorated body sherds. One of the sherds has been fired inconsistently. The main inclusions are fine quartz in both sherds, and no secondary inclusions have been documented. There are no particular surface finishes to be noted. The colour of the sherds varies from reddish-beige to (dark) grey, and the fabric has the same tones. The sherds are wheel-made, and two of the sherds have evidence of narrow, shallow tracing marks. All sherds have painted decoration, one is dark grey/black and has a line of parallel, diagonal lines, one has horizontal lines, and the last sherd has dark red painted horizontal lines and arches.

One sherd is categorised as **ware 55**. This is a decorated body sherd with fine quartz as its main inclusions and no secondary inclusions. The surface finish was clay-based. The colour of the sherd and the matrix is grey. The sherd is wheel-made and there is evidence of narrow, shallow tracing marks. The decoration consists of multiple incised lines.

Ware 61 consists of 18 sherds, of which 15 are glazed body sherds and three are glazed rim sherds. One sherd is noted to have been a failed firing. At 83.3 % of the sherds, the main inclusions are fine quartz. In two sherds, no inclusions are noted and in one sherd large quartz granules are noted. One sherd has evidence of secondary temper, which is lime. On 88.9 % of the sherds, both the interior and exterior surfaces are covered in glaze. On two sherds, only the exterior surface has evidence of glaze. Here the interior has only been treated with a clay-based surface finish. The glaze colour of the sherds is dark grey/black. The matrix of the sherds is mainly grey, but brownish and reddish colours also appear. Except for one sherd, all are wheel-made. Three sherds show evidence of shallow tracing marks. No decorations aside from the glazed surfaces are present on the sherds.

147 sherds are documented as **ware 62** (Bahla Ware). The majority, 99 sherds, are glazed body sherds, 30 are rim fragments and 18 are bases. 3.4 % of the sherds have been fired inconsistently, and the remainder of the sherds show no firing peculiarities. The main inclusions are fine quartz at 93.9 % of the sherds, and the other sherds have larger quartz granules as their main inclusions. Secondary inclusions are not present in these sherds. On 98.0 % of the sherds, the exterior surface is glazed. The interior is glazed on 91.8 % of the sherds. The other interior surface finishes consist of a clay-based finish in four cases and a covering slip in one case. The colour of the sherds surface is in almost all cases yellow-green or similar green tones. The colours of the fabric vary more; grey, brown and reddish are the most common. Except for one sherd, all are documented to have been wheel-made. Three sherds show evidence of shallow, narrow tracing marks, and two sherds show evidence of deeper tracing marks. One sherd has a hole and one sherd has a hole that has been added after use.

To **ware 63**, the second of the two Bahla wares from Tawi Said, 55 sherds are attributed. Of these, 36 are glazed body sherds, 13 are rim sherds, and six are bases. One sherd is documented to have been fired inconsistently, and the other sherds do not appear to have any peculiarities with regard to the firing. 87.3 % of the sherds have fine quartz as their main temper, and the other sherds have no visible temper in the fabric. One sherd has evidence of secondary temper, which are large quartz granules. 96.4 % of the sherds have a glazed exterior surface and 94.6 % of the sherds have a glazed interior surface. The colour of the exterior surface is mainly yellowish-green or olive-green. The interior surface has similar tones of yellowish-green and olive-green. The fabric consists mainly of grey tones,

but a few brown and yellowish tones are also present. All the sherds are wheel-made and five sherds have evidence of shallow, narrow tracing marks. One sherd shows deeper tracing marks. One sherd was altered for secondary use. Aside from the glazed surfaces, no other decoration is present. One sherd has a vertical loop handle.

Four sherds are described as **ware 64**. This ware was also documented by de Cardi during her survey of Tawi Said.[19] Three of these are glazed body sherds, and one is a rim fragment. In two sherds, the main temper is noted to be fine quartz, and in the other sherds, no temper is noted. Almost all sherds have a glazed interior and exterior, except for one sherd, which only has a glazed exterior. The colour of the exterior is turquoise. The interior of the sherds is dark grey, turquoise, or pale yellow in the case of the unglazed interior. The fabric is in almost all cases pale yellow, except for one sherd, which has a light brown fabric. All sherds were wheel-made and one sherd shows evidence for narrow, shallow tracing marks. No decoration outside of the glaze was present on the sherds. This ware is also known as Turquoise Glazed Ware (TURQ).[20]

Ware 65 consists of 42 sherds of the Tawi Said assemblage. These can be separated into 31 glazed body sherds, four rim sherds, five base sherds and two handles. In 66.7 % of the sherds, the main temper is fine quartz. One sherd has large quartz granules as its main temper, and the remainder of the sherds have no main temper visible in the fabric. In none of the sherds was a secondary temper noted. All the sherds have glaze on the exterior surface and 90.5 % of the sherds have glaze on the interior surface as well. One sherd has a smoothed interior surface. The colour of the sherds is mainly green, dark green or olive-green. The fabric is mainly grey coloured. Almost all sherds are wheel-made, except for two sherds, which are noted to be handmade. No decoration, outside of the glazed surfaces, have been noted. On two sherds, vertical loop handles are present, and on one sherd, there is evidence for a horizontal loop handle.

One sherd is documented as **ware 66**. This is a glazed body sherd with fine quartz as its main temper. No secondary temper has been noted. Both the interior and the exterior of the sherd has been glazed. The colour of the surface is grey-green and the fabric is light grey. The sherd is wheel-made.

For **ware 67** (Sgraffiato), four sherds are documented. Two are glazed body sherds and two are base fragments. All sherds have fine quartz as their main temper and no secondary temper is noted. One sherd has glaze on the exterior, two sherds have glaze on the interior surface and one has glaze on the interior and exterior surfaces. The colour of these surfaces is light green or yellow-green. Where the glaze is not present, the colour is buff or light beige. The colour of the fabric is also buff or light beige. The sherds were wheel-made and have evidence of incised lines as decoration.

Two sherds are documented as **ware 68**. One is a rim and the other is a decorated body sherd, both with fine quartz as their main temper and no visible secondary temper. The interior and the exterior surface are glazed on both sherds, and the colour of the surfaces is beige. The fabric is coloured light beige. Both sherds are wheel-made and have blue painted decoration. The decoration patterns are a floral pattern and horizontal lines combined with a row of parallel, diagonal lines.

Ware 70 consists of 15 sherds, all decorated body sherds. One sherd was fired inconsistently. The main temper is fine quartz, and only one sherd has large quartz granules as its main temper. Two sherds have secondary temper, which are also fine and large quartz granules. 33.3 % of the sherds display a covering slip on the exterior surface. The remainder of the sherds are treated with a clay-based surface finish. The interior of all sherds was only treated with a clay-based surface. The majority of the sherds have orange-red as their interior and exterior colouring. The other colours that appear on the sherd surfaces are brown and other red tones. The fabric has similar colouring as the surfaces, except that grey tones also appear on some sherds. All the sherds have been wheel-made and they have all been decorated by comb incisions in multiple directions.

2.3 The pottery of Tawi Said

2.3.1 The number of ceramic wares

If we consider the different ceramic ware types that were documented at Tawi Said (Fig. 15 and Tab. 1), ware 30 and ware 11 are the most common in the dataset. Ware 30 makes up 41.5 % and ware 11 makes up 35.3 % of the Tawi Said assemblage. After that comes ware 13 with 13.6 %. The other wares comprise 2.1 % or less of the Tawi Said ceramics.

2.3.2 Decoration of the ceramic wares

The most common decoration technique is a completely painted surface (decoration 105), which occurs in more than half of the cases for ware 30 (Tab. 2). Ware

19 De Cardi 1977: 63.

20 Carter 2011: 38; Kennet 2004: 35–36; Priestman 2005: 234–239; Power – Sheehan 2012: 297; Rosendahl *et al*. 2015: 93.

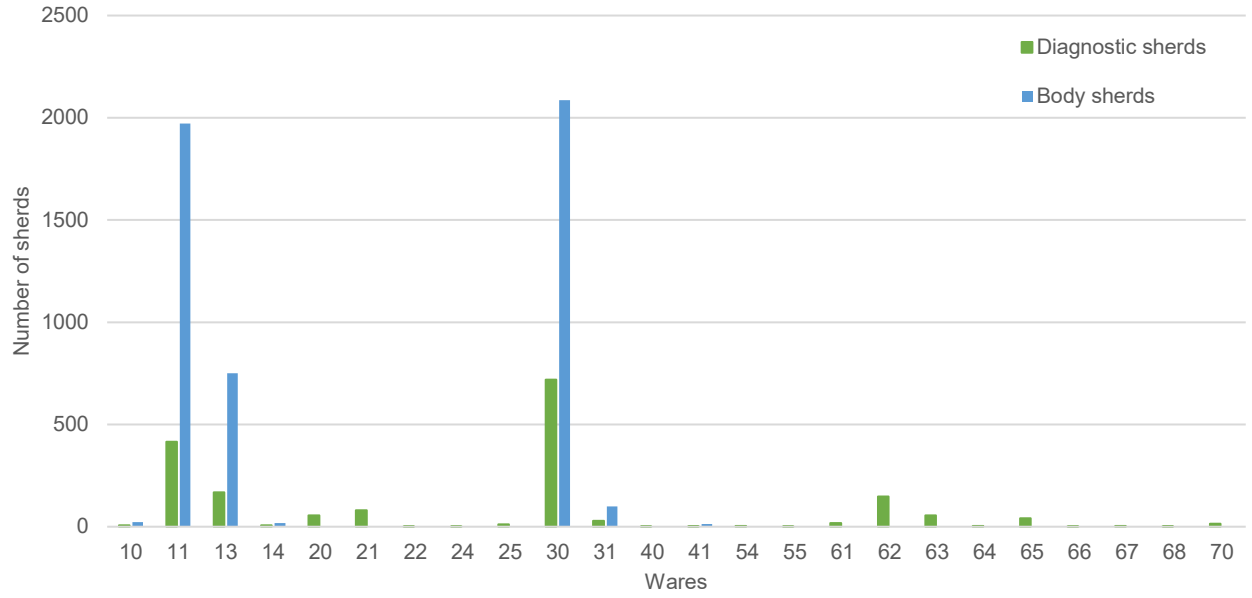

Fig. 15: Different ceramic ware types documented at Tawi Said.

Ware	Diagnostic sherds	Body sherds	Total number
10	7	23	30
11	415	1972	2387
13	168	751	919
14	7	18	25
20	56		56
21	80		80
22	1		1
24	1		1
25	11	1	12
30	719	2086	2805
31	29	99	128
40	1	1	2
41	2	13	15
54	3		3
55	1		1
61	18		18
62	147		147
63	55		55
64	4		4
65	42		42
66	1		1
67	4		4
68	2		2
70	15		15
Total	**1789**	**4964**	**6753**

Tab. 1: Number of ceramic wares at Tawi Said.

20 and ware 21 have the highest variety of decoration techniques, mainly consisting of painted lines, horizontal, vertical, painted arches, painted zig-zag and crosshatched motifs or a combination of these motifs. Next to the painted motifs, there is evidence for negative decoration techniques, in the form of incised horizontal or vertical line(s) (decoration 302, wares 11 and 67; decoration 310, wares 11 and 55), an incised row of waves (decoration 304, wares 11, 13 and 30), fingernail impressions (decoration 318, ware 14), a combination of these, and comb impressions, both in varying directions (decoration 380, ware 70) and horizontal (decoration technique 381, wares 11, 13, 14 and 31). Lastly, there are also a few positive decoration techniques evident in the dataset. These are a straight ridge (decoration 401, wares 11 and 30), a ridge with vertical or diagonal stripes (decoration 405, ware 21), a combination of incised Xs on a straight ridge (decoration 457, ware 30) and a combination of a straight ridge and comb incisions (decoration 475, ware 30).

2.3.3 Form typology

2.3.3.1 The vessel types and form groups

At Tawi Said, we see a variety of ceramic forms (Fig. 16), to which a total of 351 sherds are ascribed. The largest group are the flasks (vessel type 5), which consists of 116 sherds. 79 sherds are described as shallow bowls (vessel type 1), 51 as deep bowls (vessel type 2), 50 as pots (vessel type 6), 46 as beakers (vessel type 4), seven as cups (vessel type 3), one as a large vessel (vessel type 7) and one as a jar stopper (vessel type 9).

The vessel types can be divided into varying form groups (Tab. 3). The deep and shallow bowls appear both with rounded and with a conical wall-profile (form groups 01, 02, 11 and 12). They make up 37.0 % of the ceramic form groups. All cups are rounded cups (form group 21),

Decoration technique	Ware										
	10	11	13	14	20	21	22	24	25	30	31
101			4.6 %		27.7 %	60.0 %			6.2 %		
102			13.3 %		13.3 %	60.0 %	6.7 %		6.7 %		
104									100 %		
105	0.3 %	27.7 %	11.5 %		0.3 %	0.4 %				59.4 %	0.3 %
109			4.8 %		42.9 %	38.1 %			14.3 %		
118					64.7 %	23.5 %		5.9 %			
119											
124					50.0 %	50.0 %					
131			25.0 %		50.0 %					25.0 %	
132					33.3 %	33.3 %			33.3 %		
136			50.0 %								
139			75.0 %						25.0 %		
150					50.0 %	50.0 %					
152					14.3 %	71.4 %					
153					100 %						
158					33.3 %	66.7 %					
165					75.0 %	25.0 %					
171					100 %						
172						100 %					
187						100 %					
192					50.0 %						
302		66.7 %									
304		44.4 %	22.2 %							33.3 %	
310											
318				100 %							
355			20.0 %							80.0 %	
380											
381		62.5 %	20.8 %	12.5 %							4.2 %
401		75.0 %								25.0 %	
405						100 %					
457										100 %	
475										100 %	

Decoration technique	Ware					
	54	55	67	68	70	Total
101	1.5 %					68
102						15
104						1
105						924
106						1
109						18
116						1
118						13
119				100 %		1
124						2

Decoration technique	Ware					
	54	55	67	68	70	Total
131						4
132						3
136	50.0 %					2
139						4
150						2
152	14.3 %					7
153						1
158						3
165						4
171						1

Decoration technique	Ware					
	54	55	67	68	70	Total
172						2
187						1
192				50.0 %		2
302			33.3 %			8
304						9
310		100 %				5
318						1
355						5
380					100 %	11
381						22
401						4
405						1
457						5

Tab. 2: The percentage of decoration techniques per ceramic ware at Tawi Said.

which make up 2.0 %. The beakers have three different form groups, the rounded beakers, the conical beakers and the vertical beakers (form groups 25, 26 and 27), consisting of 13.1 % of all the sherds that fit into a form group. The flasks can again be divided into two groups, the flasks with a short neck and flasks with a medium or long neck (form groups 30 and 31). These groups contribute 33.0 % of the sherds. Lastly, the pots, large vessels and jar stoppers all have one form group (respectively 40, 70 and 90), making up 14.2 %, 0.3 % and 0.3 % of the assemblage.

Vessel type	Form group
Shallow bowl (01)	01 Shallow rounded bowls
	02 Shallow conical bowls
Deep bowl (02)	11 Deep rounded bowls
	12 Deep conical bowls
Cup (03)	21 Rounded cups
Beaker (04)	25 Rounded beakers
	26 Conical beakers
	27 Vertical beakers
Flask (05)	30 Flasks with short neck
	31 Flasks with medium or long neck
Pot (06)	40 Pots
Large vessel (07)	70 Large vessels
Jar stopper (09)	90 Jar stoppers

Tab. 3: Overview of the different form groups per vessel type at Tawi Said.

2.3.3.2 The ceramic wares of the vessel types and form groups

Considering the percentages of ceramic wares within the specific form groups (Tab. 4), it becomes clear that wares 11, 13, 30 and 31 have a very diverse range of vessel types

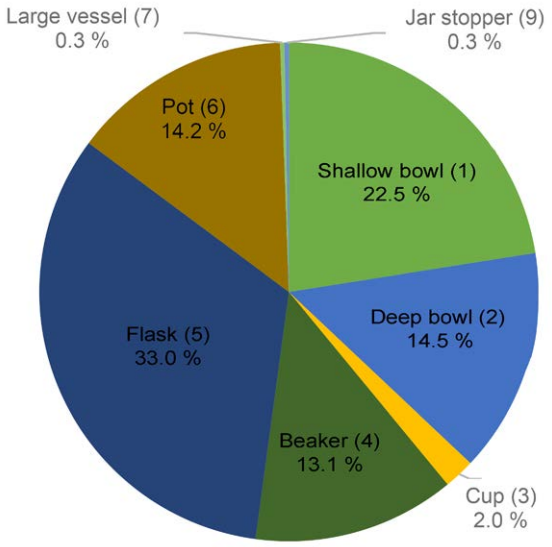

Fig. 16: The vessel types at Tawi Said.

and form groups. Ware 11 has the highest percentage of pots (56.0 %), where ware 30 has the highest percentage of flasks (70.7 %) and the highest percentage of deep bowls (33.3 %) and shallow bowls (36.3 %). Ware 20 also has a diverse range of vessel types, and an especially high percentage of beakers within its assemblage. The glazed wares, wares 61, 62, 63, 64, 65, 67 and 68, appear more in the form of shallow and deep bowls, and in a few cases in the form of beakers and flasks as well. Ware 41 has only deep rounded bowls in its assemblage. For ware 25, only shallow bowls are noted, and ware 54 and ware 68 consist only of cups. Ware 10 consists of flasks.

2.3.4 The bases

2.3.4.1 The base forms

The bases are determined by a base typology (Tab. 5), because they usually do not fit within a form group. At Tawi Said, there is evidence for uneven bases (base form 2), flat bases (base form 3), slightly offset flat bases (base form 4), disc bases (base form 5), ring bases (base form 6) and bases with a foot (base form 7). The largest group are clearly the flat bases, consisting of 64.2 % of the total number of base forms, followed by the ring bases with 15.6 %, and the bases with a foot with 10.4 %. The uneven bases, the slightly offset flat bases and the disc bases are represented by low numbers in the total assemblage.

When combining the main base forms with the diameter, this yields the following table (Tab. 6). The biggest group are the flat bases from type 3.02 with 44.5 %. The diameters between 41 and 80 mm are the most common, with 18.5 %, followed by the base diameters between 81 and 160 mm with 15.6 %. The second largest group are again flat bases with base type 3.03. The most common diameters are between 81 and 160 mm, to

Vessel type	Form group	Ware 10	Ware 11	Ware 13	Ware 20	Ware 21	Ware 25	Ware 30	Ware 31	Ware 41	Ware 54
Shallow bowl (1)	01		21.2 %					45.5 %	12.1 %		
	02		4.3 %	4.3 %	4.3 %		2.1 %	29.8 %	17.0 %		
Shallow bowls total			11.3 %	2.5 %	2.5 %		1.3 %	36.3 %	15.0 %		
Deep bowl (2)	11		16.7 %	6.7 %				30.0 %	10.0 %	3.3 %	
	12		4.8 %					38.1 %	19.0 %		
Deep bowls total			11.8 %	3.9 %				33.3 %	13.7 %	2.0 %	
Cup (3)	21		16.7 %	33.3 %	11.1 %			16.7 %			16.7 %
Cups total			16.7 %	33.3 %				16.7 %			
Beaker (4)	25		14.6 %	14.6 %	31.7 %	14.6 %		12.2 %			
	26			50.0 %				50.0 %			
	27		66.7 %		33.0 %						
Beakers total			14.5 %	9.2 %	18.4 %	7.9 %		7.9 %			
Flask (5)	30		18.8 %	4.7 %				70.3 %	3.1 %		
	31	3.8 %	9.6 %	7.7 %	1.9 %			71.2 %	1.9 %		
Flasks total		1.7 %	14.7 %	6.0 %	0.9 %			70.7 %	2.6 %		
Pot (6)	40		56.0 %	14.0 %				28.0 %	2.0 %		
Pots total			56.0 %	14.0 %				28.0 %	2.0%		
Large vessel (7)	70										
Large vessels total											
Jar stopper (9)	90							100 %			
Jar stoppers total								100 %			

Vessel type	Form group	Ware 61	Ware 62	Ware 63	Ware 64	Ware 65	Ware 67	Ware 68	Total
Shallow bowl (1)	01		12.1 %	6.1 %		3.0 %			33
	02	2.1 %	17.0 %	12.8 %		4.3 %	2.1 %		47
Shallow bowls total		1.3 %	15.0 %	10.0 %		3.8 %	1.3 %		80
Deep bowl (2)	11	3.3 %	30.0 %						30
	12	4.8 %	23.8 %	9.5 %					21
Deep bowls total		3.9 %	27.5 %	3.9 %					51
Cup (3)	21							16.7 %	6
Cups total								16.7 %	6
Beaker (4)	25		4.9 %						41
	26								2
	27								33
Beakers total			2.6 %						76
Flask (5)	30			1.6 %		1.6 %			64
	31		3.8 %						52
Flasks total			1.7 %	0.9 %		0.9 %			116
Pot (6)	40								50
Pots total									50
Large vessel (7)	70				100 %				1
Large vessels total					100 %				1
Jar stopper (9)	90								1
Jar stoppers total									1

Tab. 4: The percentage of vessel types and form groups per ceramic ware at Tawi Said.

Main base forms	Number
Uneven base (2)	1
Flat base (3)	111
Slightly offset flat base (4)	9
Disc base (5)	7
Ring base (6)	27
Base with foot (7)	18
Total	**173**

Tab. 5: Numbers of base forms at Tawi Said.

Base type	Base diameter in mm	Number	Percentage	Catalogue Number
2.01	40 <80	1	0.6 %	54
	total	1	0.6 %	
3.01	80<160	1	0.6 %	234
	total	1	0.6 %	
3.02	0	5	2.9 %	2–3, 55–58, 101–103, 136, 164, 235, 301–302
	0<40	12	6.9 %	
	41<80	32	18.5 %	
	81<160	27	15.6 %	
	>160	1	0.6 %	
	total	77	44.5 %	
3.03	0	1	0.6 %	59–61, 104–105, 236–237, 277
	0<40	4	2.3 %	
	41<80	8	4.6 %	
	81<160	13	7.5 %	
	>160	7	4.0 %	
	total	33	19.1 %	
4.01	41<80	3	1.7 %	238, 303, 339
	81<160	1	0.6 %	
	>160	2	1.2 %	
	total	6	3.5 %	
4.02	41<80	1	0.6 %	239–240
	81<160	1	0.6 %	
	>160	1	0.6 %	
	total	3	1.8 %	
5.01	0	1	0.6 %	106, 241
	81<160	4	2.3 %	
	total	5	2.9 %	
5.02	81<160	2	1.2 %	62, 329
	total	2	1.2 %	
6.01	41<80	7	4.0 %	63, 279, 304–305, 330
	81<160	2	1.2 %	
	total	9	5.2 %	
6.02	41<80	5	2.9 %	107, 306–307, 318, 331, 340
	81<160	1	0.6 %	
	total	6	3.5 %	
6.03	0	1	0.6 %	64
	total	1	0.6 %	
6.04	41<80	1	0.6 %	242, 308, 319, 332
	81<160	3	1.7 %	
	total	4	2.3 %	
6.05	0	1	0.6 %	309–310, 320–321, 333
	41<80	3	1.7 %	
	81<160	3	1.7 %	
	total	7	4.0 %	
7.01	0	6	3.5 %	65–66, 108, 243–246, 311
	41<80	2	1.2 %	
	81<160	4	2.3 %	
	>160	3	1.7 %	
	total	15	8.7 %	
7.02	81<160	1	0.6 %	247
	total	1	0.6 %	
7.03	81<160	1	0.6 %	67, 248
	>160	1	0.6 %	
	total	2	1.2 %	
Total		**173**	**100 %**	

Tab. 6: The percentages of base types and base diameters.

which 7.5 % of the sherds belong. Bases with a foot, type 7.01, make up 8.7 % of the assemblage and the ring base type 6.01 makes up 5.2 % of the assemblage. The other base types represent less than 5 %.

2.3.4.2 The base type ceramic wares

When considering the variation of bases and the different ceramic wares (Tab. 7), it becomes evident that the largest number of bases and the largest variety of base types occur with ware 11 and ware 30. Ware 13 also has a relatively high number of bases. These are mainly flat bases and a few disc bases. The glazed wares 62, 63 and 65 also have a variety of base forms, mainly within the ring bases (base form 6). The only uneven base (base form 2) is a ware 11 base, and the bases with a foot (base form 7) occur mainly within wares 11, 13 and 30, and rarely in ware 62.

2.3.5 The ware-formtypes

A summary of all the ware-formtypes can be seen in table 8. The ware-formtype consists of a combination of the ware and the formtype, separated by a '-'. When no formtype could be assigned, a '0' is noted. If a sherd does not have a formtype, like the diagnostic body sherds, a '/' is stated. The undecorated body sherds are not mentioned in this table.

The most ware-formtypes occur only once each within the dataset. The ware-formtype that is most common, is 30-/, which are the diagnostic body sherds of ware 30. This is followed by 11-/, which ware the diagnostic body sherds of ware 11. These are followed by types 13-/, 62-/. These are not real ware-formtypes, since they do not have a real formtype. The ware-formtype with the highest number of sherds, is 30-30.01.00, to which 18 sherds are

Base type	Ware 10	Ware 11	Ware 13	Ware 20	Ware 25	Ware 30	Ware 31	Ware 40
2.01		100 %						
3.01						100 %		
3.02	2.6 %	62.3 %	11.8 %	1.3 %	1.3 %	14.5 %		
3.03		24.2 %	12.1 %			60.6 %	3.0 %	
4.01						50.0 %		
4.02						100 %		
5.01			40.0 %			60.0 %		
5.02		50.0 %						
6.01		22.2 %	11.1 %					11.1 %
6.02			28.6 %					
6.03		100 %						
6.04						25.0 %		
6.05								
7.01		21.4 %	7.1 %			64.4 %		
7.02						100 %		
7.03		50.0 %				50.0 %		

Base type	Ware 62	Ware 63	Ware 65	Ware 67	Total
2.01					1
3.01					1
3.02	5.2 %				76
3.03					33
4.01	33.3 %			16.7 %	6
4.02					3
5.01					5
5.02			50.0 %		2
6.01	44.4 %		11.1 %		9
6.02	28.6 %	14.3 %	14.3 %	14.2 %	7
6.03					1
6.04	25.0 %	25.0 %	25.0 %		4
6.05	42.9 %	42.9 %	14.3 %		7
7.01	7.1 %				14
7.02					1
7.03					2

Tab. 7: The percentages of base types per ware.

Ware-form-type	Number	Catalogue Number
10-/	3	/
10-0	2	2–3
10-31.19.00	2	1
11-/	255	70–73
11-0	68	54–69
11-01.02.00	1	4
11-01.03.00	1	5
11-01.07.00	1	6
11-01.08.00	2	7
11-01.11.00	1	8
11-01.16.00	1	9
11-02.01.00	1	10
11-02.09.00	1	11
11-11.07.00	1	12
11-11.16.00	1	13
11-11.21.00	2	14
11-11.22.00	1	15
11-12.04.00	1	16
11-21.03.00	1	17
11-25.03.00	9	18
11-27.02.00	2	19
11-30.01.00	1	20
11-30.04.00	1	21
11-30.16.00	1	22
11-30.17.00	2	23–24
11-30.19.00	1	25

Ware-form-type	Number	Catalogue Number
11-30.30.00	1	26
11-30.36.00	2	27–28
11-30.37.00	1	29
11-30.38.00	1	30
11-30.40.00	1	31
11-31.15.00	1	32
11-31.19.00	1	33
11-31.31.00	1	34
11-31.32.00	1	35
11-31.37.00	1	36
11-40.03.00	1	37
11-40.05.00	1	38
11-40.06.00	2	39
11-40.07.00	1	40
11-40.23.00	2	40
11-40.24.00	3	42
11-40.25.00	1	43
11-40.28.00	2	44
11-40.29.00	5	45
11-40.51.00	2	46
11-40.54.00	1	47
11-40.58.00	2	48–49
11-40.59.00	1	50
11-40.60.00	1	51
11-40.62.00	2	52
11-40.68.00	1	53

Ware-form-type	Number	Catalogue Number
13-/	114	113–118
13-0	23	101–112
13-02.01.00	1	75
13-02.09.00	1	76
13-11.04.00	1	77–78
13-21.02.00	1	79
13-21.06.00	1	80
13-25.03.00	6	81–86
13-26.05.00	1	87
13-30.39.00	1	88
13-30.41.00	1	89
13-30.43.00	1	90
13-31.18.00	1	91
13-31.19.00	1	92
13-31.33.00	2	93
13-40.02.00	1	94
13-40.18.00	1	95
13-40.29.00	1	96
13-40.44.00	1	97
13-40.60.00	1	98
13-40.61.00	1	99
13-40.64.00	1	100
14-/	4	119–122
20-/	37	137–144
20-0	3	136
20-02.09.00	1	123

Ware-form-type	Number	Catalogue Number
20-25.03.00	13	124–133
20-27.02.00	1	134
20-31.30.00	1	135
21-/	74	151–160
21-25.03.00	6	145–150
22-/	1	161
24-/	1	162
25-/	9	165–169
25-0	1	164
25-02.11.00	1	163
30-/	482	249–260
30-0	59	234–252
30-01.01.00	1	170
30-01.02.00	5	171
30-01.03.00	3	172
30-01.08.00	1	173
30-01.12.00	3	174–175
30-01.15.00	2	176
30-02.01.00	1	177
30-02.04.00	6	178
30-02.05.00	2	179
30-02.06.00	1	180
30-02.07.00	1	181
30-02.12.00	3	182
30-11.06.00	1	183
30-11.11.00	3	184
30-11.14.00	2	185
30-11.16.00	3	186
30-11.23.00	1	187
30-12.02.00	4	188
30-12.06.00	4	189
30-21.08.00	1	190
30-25.03.00	4	191
30-25.04.00	1	192
30-26.06.00	1	193
30-30.01.00	21	194–197
30-30.06.00	2	198
30-30.13.00	1	199
30-30.17.00	1	200
30-30.24.00	4	201
30-30.25.00	2	202
30-30.27.00	1	203
30-30.28.00	3	204
30-30.37.00	2	205
30-30.40.00	4	206
30-30.42.00	2	207
30-30.44.00	1	208
30-30.47.00	1	209
30-31.02.00	3	210–211
30-31.03.00	3	212
30-31.08.00	1	213
30-31.10.00	4	214
30-31.12.00	4	215
30-31.15.00	1	216
30-31.19.00	1	217
30-31.21.00	13	218
30-31.24.00	5	219
30-31.30.00	1	220
30-31.31.00	1	221
30-40.15.00	1	222
30-40.19.00	2	223
30-40.22.00	1	224
30-40.32.00	1	225
30-40.33.00	2	226
30-40.35.00	1	227
30-40.45.00	1	228
30-40.60.00	2	229
30-40.65.00	1	230
30-40.66.00	1	231
30-40.69.00	1	232
30-90.01.00	1	233
31-/	1	/
31-0	2	277–278
31-01.02.00	1	261
31-01.14.00	1	262
31-01.15.00	2	263
31-02.04.00	2	264
31-02.05.00	2	265
31-02.07.00	3	266
31-02.08.00	1	267
31-11.16.00	3	268–269
31-12.02.00	1	270
31-12.06.00	2	271
31-12.10.00	1	272
31-30.44.00	1	273
31-30.47.00	1	274
31-31.03.00	1	275
31-40.32.00	1	276
40-0	1	279
41-11.19.00	1	280
54-/	2	282–283
54-21.07.00	1	281
55-/	1	284
61-/	15	/
61-02.05.00	1	285
61-11.14.00	1	286
61-12.09.00	1	287
62-/	99	/
62-0	17	301–311
62-01.01.00	3	288
62-01.14.00	1	289
62-02.01.00	1	290
62-02.04.00	1	291
62-02.05.00	5	292
62-02.13.00	1	293
62-11.14.00	9	294–295
62-12.02.00	3	296
62-12.06.00	2	297
62-25.03.00	2	298
62-31.09.00	1	299
62-31.12.00	1	300
63-/	35	/
63-0	6	318–322
63-01.03.00	1	312
63-01.15.00	1	313
63-02.05.00	5	314
63-02.10.00	1	315
63-12.05.00	2	316
63-30.38.00	1	317
64-/	3	324
64-70.02.00	1	323
65-/	29	/
65-0	8	329–336
65-01.15.00	1	325
65-02.05.00	2	326–327
65-30.32.00	1	328
66-/	1	337
67-/	1	/
67-0	2	339–340
67-02.05.00	1	338
68-21.10.00	2	341–342
70-/	15	343–345

Tab. 8: The ware-formtypes of Tawi Said.

assigned. This is followed by 20-27.01.00 with 13 sherds, 30-31.21.00 with 12 sherds and 62-11.14.00 with 11 sherds.

2.4 The chronological range of the Tawi Said pottery

2.4.1 The Wadi Suq period

The most characteristic Wadi Suq period pottery sherds from Tawi Said belong to beakers, which are generally one of the most typical shapes of this period. Beaker 25.03.00 (no. 18, 81–86, 124–133, 145–150) is characterised by a slightly rounded to vertical upper part and simple, vertical rim. It is the most common beaker type at Tawi Said and is attested here 34 times in the fine, low to medium tempered quartz ware 11, the medium coarse, mineral-rich ware 13, the fine, mineral-tempered ware 20 with black painting on a red background as well as in the fine, mineral-tempered ware 21 with black painting on a yellowish-beige to pale-brown background, often with different painted decorations. The latter are horizontal lines (decoration 101, no. 125–126, 145–146), zig-zag-lines (decoration 124, no. 127), cross-hatching (decoration 131, no. 82, 128), combinations of horizontal and curved lines (decoration 152, no. 148), combinations of horizontal and narrow wavy lines (decoration 150, no. 129, 147), combinations of horizontal lines and triangles made of parallel diagonal lines (decoration 153, no. 130), combinations of horizontal lines and filled (decoration 165, no. 131–132) or cross-hatched diamonds (decoration 172, no. 149–150) and combinations of horizontal and diagonal lines (decoration 192, no. 133). The two sherds of the latter decoration in ware 20, TWS18A-01926 (Fig. 17) and TWS18A-03146, as well as the two sherds of the ware 21, TWS18A-01813 and TWS18A-01831, most likely belong to the same vessels. Similar beakers of this type can be found at Tombs S2117 and S2184 in Samad,[21] at Dadna,[22] at Hili 8 period III,[23] Nud Ziba[24] and at Kalba.[25] Here, Carter dates his 'Cup 7' to the Classic/Late Wadi Suq period. During her stay at Tawi Said, de Cardi also documented this type of beaker.[26] Beakers of slightly different shapes but with the same decorations as the ones found at Tawi Said are very common. Beakers with simple horizontal lines are attested amongst others at Tell

Fig. 17: TWS18A-01926 *in situ*.

Fig. 18: TWS18A-01128 *in situ*.

Abraq,[27] Hili 8 period III,[28] Dadna,[29] Shimal Tombs Sh1[30] and Sh6,[31] Bidya,[32] Qarn al-Harf[33] and Jebel Buhais.[34] Beakers with cross-hatching are known from Tell Abraq,[35] Shimal Tomb Sh1[36] and Qarn al-Harf,[37] beakers with a combination of horizontal and narrow wavy lines from Tell Abraq,[38] Hili 8 period III,[39] Shimal Tombs Sh1[40] and Sh6,[41] Bidya,[42] Qarn al-Harf,[43] Jebel Buhais[44] and Samad.[45]

21 Yule 2001: Taf. 261, Taf. 341.
22 Benoist – Ali Hassan 2010: 86 fig. 2.3, 5.
23 Méry 2000: 254 fig. 160.1–3.
24 Kennet – Velde 1995: 90 fig. 10.36–38.
25 Carter 1997: fig. 25.1.
26 De Cardi – Doe – Roskams 1977: 62 fig. 2.30; de Cardi – Bell – Starling 1979: 89 fig. 11.1–4, 11.
27 Potts 1991: 49 fig. 49.3.
28 Méry 2000: 254 fig. 160.5–6.
29 Benoist – Ali Hassan 2010: 86 fig. 2.5.
30 Donaldson 1984: 284 fig. 4.14.
31 De Cardi 1988: 75 fig. 5.7, 15.
32 Al-Tikriti 1989: pl. 63B.
33 De Vreeze in prep.: QAH6.136, QAH2.064, QAH6.136, QAH6.138, QAH2.064, QAH6.175, QAH6.234.
34 Jasim 2006: 24 fig. 21.4.
35 Potts 1991: 49 fig. 49.14.
36 De Cardi 1988: 59 fig. 6.22.
37 De Vreeze in prep.: 5.065, 5.094, QAH6.213, 6.211.
38 Potts 1991: 49 fig. 49.4, 6, 9, 41, fig. 52.1.
39 Méry 2000: 254 fig. 160.7.
40 De Cardi 1988: 57 fig. 5.2, 7, 11, 13, 59, fig. 6.31.
41 Donaldson 1984: 283 fig. 3.3, 5, 8, 284 fig. 4.9, 15, 18, 285 fig. 5.32, 39.
42 Al-Tikriti 1989: pl. 63A, C.
43 De Vreeze in prep.: 1.069, 1.080, 2.052, 2.057, 2.058, 2.066, 5.077, 5.087, 5.107, 5.111, QAH6.220, QAH6.223, QAH6.227, 6.196, 6.192.
44 Jasim 2006: 24 fig. 21.1–3, 5–6, 39, fig. 48.3.
45 Yule 2001: Taf. 370.

Remarkably, no similar artefacts are known for the lines of filled diamonds were made and only few for the cross-hatched diamonds or triangles (Fig. 18).[46]

Three sherds, TWS18A-01778, TWS18A-02430 and TWS18A-06853 (no. 84–85 and 113), decorated with vertical lines in dark red to brown (decoration 139) could belong to the same type of beaker, for which similar artefacts with the same type of decoration can be found from Wadi Suq tombs in Qarn al-Harf.[47] They are the medium-coarse, mineral-rich ware 13. However, these sherds could also belong to open bowls. According to Velde, small open bowls with a band of hanging strokes around the rim in red/maroon is characteristic of the Late Bronze Age.[48] Similar forms with same decoration come from Shimal SHX Late Bronze Age layers[49] and Tell Abraq.[50] Beaker 27.02.00 also features a vertical upper part, but its rim is slightly everted (no. 19 and 134). It occurs only three times in the studied assemblage but has plenty of similarities to artefacts from other sites in Eastern Arabia. These are Kalba,[51] Tell Abraq locus 40,[52] Hili 8 period III,[53] Shimal Tomb Sh1,[54] Dadna,[55] Bidya 1,[56] Nud Ziba,[57] Qarn al-Harf[58] and Jebel Buhais Tomb BHS37.[59] Similar beakers were also encountered by de Cardi at Tawi Said.[60] Three simple bases can be attributed to such beakers because of their ceramic ware and decorations. These are TWS18A-00975, TWS18A-02350 and TWS18A-03778 (no. 2–3 and 136).

Another Wadi Suq period form is cup 21.07.00 (no. 281). It distinguishes itself by a globular body and a simple, rounded rim. The only example from Tawi Said is of the mineral-tempered, grey ware 54 painted with a horizontal line decoration. It looks like a deoxidised burned version of ware 21. Similar artefacts to this type of cup come from Tell Abraq and Sharm, albeit without decoration,[61] and with a different decoration from the Wadi Suq.[62] Most similar in shape and decoration is a cup from Hili 8 phase III.[63] Although no similar artefacts could be found for jar 31.30.00 (no. 135), its ware and decoration firmly place it into the Wadi Suq period. It has a high, flaring neck and simple, straight rim. Jar 40.29.00 (no. 45 and 96), characterised by a short neck and an elongated rim, was found six times at Tawi Said. It has similarities to Kalba in Carter's type 'Jar 4', which he dates to the classical Wadi Suq period.[64] Further similar artefacts come from locus 40 at Tell Abraq[65] and Hili 8 period III.[66] Jar 40.68.00 (no. 53) is characterised by several parallel grooves on its lips. Similar sherds were found at Classic/Late Wadi Suq layers in Kalba[67] and without such grooves from the Late Bronze Age layers of Shimal SHX[68] and from locus 40 at Tell Abraq[69].

The eleven body sherds with several parallel diagonal lines of ware 20 and the four sherds of ware 21 (decoration 118, no. 139–141 and 153–154) have similarities with various Wadi Suq period contexts. At least some of those of ware 21 belong to the same vessel as TWS18A-06404, which displays a zig-zag-pattern of several parallel lines (decoration 124, no. 155). TWS18A-00315, TWS18A-02540_6 and TWS18A-02540_7 of ware 20 as well as TWS18A-03265 of ware 25 have a combination of a horizontal line and several parallel diagonal lines (decoration 158, no. 144). There is also one sherd, TWS18A-02176, with the same decoration of several parallel diagonal lines but of the fine, mineral-tempered ware 24 with reddish coloured decoration. This is a very typical decoration for the Wadi Suq period, especially for beakers. Parallels exist for example at Tell Abraq,[70] Hili 8 period III,[71] Shimal Tombs Sh1[72] and Sh6,[73] Dadna[74] as well as Jebel Buhais Tomb BHS37[75] and is also common in the pottery that was collected by de Cardi from Tawi Said.[76] TWS18A-00788 is a body sherd of ware 21 decorated with a combination of a horizontal line and line of filled diamonds below (decoration 165, no. 157). A similar decoration but with a hashed instead of a solidly filled diamond is present at TWS18A-06062 (decoration 172, no. 158). Its decoration is similar to TWS18A-01813 (no. 149), although both sherds do

46 From Tomb S21113 at Samad: Yule 2001: Taf. 371; from Qarn al-Harf: de Vreeze in prep.: Q5.89.
47 De Vreeze in prep.: QAH6.233.
48 Velde 2003: 105.
49 Velde 1992: Taf. 56 Hss01.1, Taf. 57 Hss05.1.18; Vogt – Franke-Vogt 1987: fig. 44.4–14.
50 Potts 1991: 60 fig. 71.3, 5.
51 Carter 1997: fig. 20.3 'cup 3'.
52 Potts 1991: 49 fig. 49.3–5.
53 Méry 2000: 154 fig. 160.4, 6; Righetti – Cleuziou 2010: 284 fig. 1.11–17.
54 Donaldson 1984: 283 fig. 3.3, 7.
55 Benoist – Ali Hassan 2010: 86 fig. 2.1–2.
56 Al-Tikriti 1989: pl. 64A.
57 Kennet – Velde 1995: 90 fig. 10.35, 40.
58 De Vreeze in prep.: QAH2.046, QAH6.192, QAH5.9, QAH2.044, QAH2.052.
59 Jasim 2006: 39 fig. 48.2.
60 De Cardi – Doe – Roskams 1977: 62 fig. 2.32–33.
61 Potts 1991: 58 fig. 69.8; Barker 2002: 5 fig. 3.4–6.
62 Frifelt 1975: 410 fig. 22b.
63 Righetti – Cleuziou 2010: 286 fig. 2.3.
64 Carter 1997: fig. 22.4.
65 Potts 1991: 47 fig. 47.3.
66 Righetti – Cleuziou 2010: 288 fig. 4.1.
67 Carter 1997: fig. 27.2 'Jar 13'.
68 Velde 1992: Taf. 44 Dto05.2.
69 Potts 1991: 52 fig. 53.4.
70 Potts 1991: 49 fig. 49.7–8, 20, 12, 60 fig. 71.7.
71 Méry 2000: 254 fig. 160.8, 256 fig. 162.1.
72 Donaldson 1984: 283 fig. 3.1–2, 7, 284 fig. 4.13, 16–17, 19, 285 fig. 5.38.
73 De Cardi 1988: 57 fig. 5.3, 6, 12, 59 fig. 6.21, 24, 25–26, 28, 30.
74 Benoist – Ali Hassan 2010: 86 fig. 2.1–2.
75 Jasim 2006: 39 fig. 48.1–2.
76 De Cardi – Doe – Roskams 1977: 62 fig. 2.45–47; de Cardi – Bell – Starling 1979: 89 fig. 11.24–25.

not belong to the same vessel. Similar artefacts with this decoration come from the Wadi Suq period tombs at Wadi Sunaysl[77] and from Tomb S10932 at Samad.[78] TWS18A-02125 features a cross-hatched band above a horizontal line (decoration 187, no. 159), another characteristic Wadi Suq period decoration.

The following pottery shapes are also possibly of a Wadi Suq period date but are comparable to Umm an-Nar contexts as well. Bowl 01.07.00 (no. 6) of the fine, low to medium tempered quartz ware 11 is characterised by an internally and externally thickened rim. It has similarities to Kalba in Carter's 'Bowl 3', which dates to his classical Wadi Suq period,[79] in Nud Ziba[80] and in locus 40 in Tell Abraq, but here with painted stripe decoration on the rim.[81] Further similar artefacts from the Umm an-Nar period were found for example at Hili[82] and Bat.[83] Bowl 01.11.00 (no. 8) of the fine, low to medium tempered quartz ware 11 is like bowls from the Classic Wadi Suq period in Kalba[84] and from Hili 8 period III.[85] It has an internally and externally thickened rim and a slight carination. Umm an-Nar similarities were found at Bat.[86] Similar artefacts to jar 40.03.00 (no. 37) come from Bidya 1,[87] but also from the Umm an-Nar periods levels of Hili 8.[88] It is characterised by a short neck and a triangular rim. Jar 40.05.00 (no. 38) has features comparable to Umm an-Nar period levels at Hili 8 as well.[89] Jars 40.06.00 (no. 39) and 40.07.00 (no. 40) have parallels with Umm an-Nar contexts at Hili 8[90] as well as Al-Khashbah Buildings II and IV.[91] These jars have a horizontal groove on its rim. They are also similar to jars found in Nud Ziba.[92] Similar artefacts to jar 40.23.00 (no. 41), which is characterised by an elongated rim can be found in Umm an-Nar period contexts from Maysar,[93] Bat[94] and Al-Khashbah,[95] but also in the Late Bronze Age layers of Shimal SHX/Y.[96] Similar jars to 40.24.00 (no. 42–43), such as three examples at Tawi Said, were found at Maysar[97] and Al-Khashbah,[98] are similar to jars 40.51.00 (no. 46) and 40.54.00 (no. 47) at Building IV in Al-Khashbah.[99] Similar jars to the latter are, however, also found in Late Bronze Age layers at Shimal SHX/Y.[100] TWS18A-03122 (no. 58) is the only base from Tawi Said that displays a clear string cut, a feature that is seen as characteristic for the Wadi Suq period.

Most likely, all 54 body sherds with a simple black painted line (decoration 101, no. 137, 151 and 165) of wares 20, 21 and 25 are also of a Wadi Suq period date, although the decoration is not specific enough to claim this with full confidence. The same is possibly true for one sherd of the medium-coarse, mineral-rich ware 13, TWS18A-02619. Sherds with simple line decorations were also reported by de Cardi from her work at Tawi Said.[101] Two body sherds of ware 20, nine of ware 21, one of ware 22 and one of ware 25 display a curvy line in black to dark grey (decoration 102, no. 138, 152, 161 and 166). Six additional sherds combine this curvy line with horizontal ones (decoration 152, no. 143, 148 and 156). This is very typical for large Umm an-Nar period pottery jars,[102] but can also be found in Wadi Suq layers at Tell Abraq.[103] TWS18A-03120 of mineral-tempered ware 25 with brown/black painting on a brown background has a decoration of vertical lines (decoration 139, no. 169), which is typical for both the Umm an-Nar and the Wadi Suq periods. The background colour of these sherds is not uniform, but changes from brown to red. TWS18A-00555 displays a ridge with vertical painted lines in dark grey (decoration 405, no. 160). Similar decorations are known from large Umm an-Nar period jars.[104]

There are also six fragments of Indus Black Slipped Jars. Two of them, TWS18A-00173 and TWS18A-00982, are rim sherds of the type 40.58.00 (no. 48–49), the others body sherds. One of them, TWS18A-03772, seems to have been reworked secondarily and reshaped into a bowl (no. 76). Black Slipped Jars are a common feature of Umm an-Nar period coastal and inland sites in Eastern Arabia and also occur at the very beginning of the Wadi Suq period until about 1900 BCE.[105] Aside from imports, there is also evidence for imitations of Black Slipped Jars manufactured on the Oman Peninsula.[106]

77 Frifelt 1975: 416 fig. 26d, f.
78 Yule 2001: Taf. 178.
79 Carter 1997: fig. 21.3.
80 Kennet – Velde 1995: 90 fig. 10.30.
81 Potts 1991: 49 fig. 49.2.
82 Méry 2000: 128 fig. 75.9.
83 Schmidt 2020: Taf. 2.1049, Taf. 20.1850.
84 Carter 1997: fig.21.2 'bowl 2'.
85 Righetti – Cleuziou 2010: 286 fig. 2.15.
86 Schmidt 2020: Taf. 20.1853.
87 Al-Tikriti 1989: pl. 64B.
88 Méry 2000: 128 fig. 75.8.
89 Méry 2000: 129 fig. 76.8.
90 Méry 2000: 128 fig. 75.6.
91 Döpper – Maier – Kirchhoff 2021: Kat.-Nr. 137, 365–367, 462, 464, 630–631.
92 Kennet – Velde 1995: 88 fig. 8.3.
93 Méry 2000: 162 fig. 100.1.
94 Thornton – Ghazal 2016: fig. 9.6G, K.
95 Döpper – Maier – Kirchhoff 2021: Kat-Nr. 463, 547, 653–654, 747–748, 779.
96 Velde 1992: Taf. 41 Dvo10.4–5.
97 Weisgerber 1981: Abb. 17.5.
98 Döpper – Maier – Kirchhoff 2021: Kat-Nr. 342, 548, 655–659, 749, 808.
99 Döpper – Maier – Kirchhoff 2021: Kat-Nr. 691, 693, 761.
100 Velde 1992: Taf. 41 Dvo09.1–3.
101 De Cardi – Doe – Roskams 1977: 62 fig. 2.32–33, 44, 59; de Cardi – Bell – Starling 1979: 89 fig. 11.28, 30.
102 Méry 2000: 147; Cleuziou 1989b.
103 Potts 1991: 50 fig. 51.2.
104 Méry 2000: 127 fig. 74.6.
105 Frenez 2018: 385–386; Bernardini *et al.* 2020: fig. 15.
106 Méry *et al.* 2017: 177–178.

In summary, the Wadi Suq pottery from Tawi Said demonstrates numerous traits from the previous Umm an-Nar period, placing it right at the beginning of the Wadi Suq period. This is further supported by the presence of fragments of Indus Black Slipped Jars, which argue for a date around 1900 BCE. The high number of painted sherds, usually found in tombs, seems to be typical of smaller Wadi Suq period sites.[107]

2.4.2 The Iron Age

Three sherds, TWS18A-01311, TWS18A-01314, and TWS18A-01626 (no. 257–258), have the most compelling similarities with other Iron Age contexts. They are all body sherds of the coarsely mineral-tempered ware 30 and feature incised Xs on a straight ridge (decoration 457). This is a very common decoration for Iron Age storage jars. Parallels are known amongst others from Lizq,[108] Manal,[109] as well as from Izki, Nizwa and the Jebel Akhdar.[110] The sherds in Tawi Said come from one concentration in the centre of the survey area and thus also possibly from one vessel (Fig. 20).

2.4.3 The Early Islamic period

Regarding the Early Islamic period (c. 750–1050 CE), there appear to be few ceramic types that likely date to this period. The most common are the turquoise glazed ceramics (ware 64), of which four sherds are found at Tawi Said. The chronology of this ware is heavily debated, but it is presumed that it dates from the Sassanian period or (up to) the 14th–16th century.[111] This ware has similarities to turquoise glazed ceramics found at other sites in southeastern Arabia and are suggested to have been manufactured in Iran.[112] At Al-Balid, Oman, this ware has been found mainly in the form of conical bowls with a straight everted rim,[113] similar to 70.02.00 (no. 323).

Based on formtype, there is one closed-shape type that occurs often in the Tawi Said ceramic dataset and potentially also has an Early Islamic date. These are flasks with a medium-length neck and wide drawn-out lip (31.21.00, no. 218). All 13 sherds belong to the coarse mineral-tempered ware. Half of the sherds have a completely painted surface in brown or dark grey/black, and the other half do not have any form of decoration. This ware is possibly comparable to a Small Grey Vessel Ware or Black Burnished Ware found at Muharraq[114] and Ras al-Khaimah.[115] A characteristic of Small Grey Vessel Ware is a dark grey fabric, in some cases oxidised to a red fabric. This fabric is evident in two of the sherds from the Tawi Said assemblage and which could presumably be characterised as Small Grey Vessel Ware. This type is to be dated between the 7th and 8th century and the 11th and 12th century and produced in Iran.[116]

2.4.4 The Middle Islamic period

There appears to also be some evidence for occupation at Tawi Said during the Middle Islamic period (c. 1050–1650 CE). The clearest comes in the form of bowl 02.05.00 (no. 338) of ware 67. This bowl could be determined as sgraffiato ware, presumably hatched sgraffiato.[117] This ware is was common during the 11th and 12th century and was manufactured in southern Iran.[118] Similar sherds have been found in Wadi Madab,[119] at Kush[120] and at Wadi Andam.[121] Two other sherds that are within the formtype 12.05.00 can be attributed to yellowish-green glazed ware and have similarities to the Nabhani wares at Bisya BB-15,[122] where it is described as a late sgraffiato ware with a cream fabric and a light green and yellow glaze. A base sherd and a body sherd also have sgraffiato characteristics, specifically a greenish glaze and the presence of an incised line underneath the glaze.

There are a few undecorated coarse wares that have some possible similarities to other Middle Islamic vessels based on their formtype. This is, however, in most cases difficult to prove, but they are nevertheless briefly mentioned here. One of these is an undecorated coarse mineral-tempered sherd that can be described as a flask with a medium-length neck and a wide flaring rim (30.42.00, no. 207), for which there is a similar artefact in Wadi Andam.[123] This artefact is described as a Nabhani Middle Islamic ware (Nabhani rule: 1145–1624 CE), which is a red and grey coarseware with decoration that includes painted horizontal bands. It is suggested to be a local ware.[124] Another formtype that has similarities with Nabhani ware are flasks with a medium-length neck and an outward-curving, rounded rim (31.02.00,

107 Velde 2003: 104 footnote 5.
108 Kroll – Yule 2013: fig. 26.20.
109 ElMali – Ibrahim 2003: fig. 11.
110 Schreiber 2007: Taf. 30.3–5, Taf. 55.4–5, Taf. 64.8–9, 11, Taf. 79.1–2, 4–5.
111 Carter 2011: 38; Kennet 2004: 35–36; Priestman 2005: 234-239; Power – Sheehan 2012: 297; Rosendahl *et al*. 2015: 93.
112 Hansman 1985: 52; Kennet 2004: 56; Fusaro 2020: 78 fig. 11.
113 Fusaro 2020: 77.
114 Carter – Naranjo-Santano 2011: 45, fig. 38: 3.
115 Kennet 2004: 86.
116 Kennet 2004: 86.
117 Kennet 2004: 43.
118 Mason – Keal 1988: 461 in Kennet 2004: 43.
119 Carter 2008: 33.
120 Kennet 2004: 43.
121 Al-Jahwari 2008: 1000 pl. 430–431.
122 Whitcomb 1975: fig. 10G.
123 Al-Jahwari 2008: 770, fig. 158C.
124 Al-Jahwari 2008: 592.

no. 210–211). This formtype also looks like another Middle Islamic ware from the Wadi Andam,[125] which is called Coarse Middle Islamic Ware. This ceramic ware has a light red to greenish grey surface and is sometimes decorated with projected bands with and without wavy lines, and in some cases horizontal lines are present under the rim and around the neck. This ceramic ware is also thought to be local.[126] A third flask formtype with a straight sloping wall, an angular everted rim and a drawn-out, thinned lip (26.06.00, no. 193), also seems to be Nabhani. One sherd is documented that belongs to this formtype, and it is made of a coarse mineral-tempered ware (TWS18A-03799). This sherd is similar to one at Wadi Qant 3,[127] which is described as an orange-brown ware with a light grey core, made of a fine grit temper and decorated with comb incising. The ceramic assemblage from Wadi Qant 3 is described as Nabhani, thus dating to the Middle Islamic period. Another flask formtype from Tawi Said that has a similarity to those at Wadi Qant 3 is a flask with a medium-length neck and an outward-curving rim with a rounded lip (30.30.00, no. 26). This type at the Wadi Qant 3 is described as orange-pink ware, with broad, vertical incised lines and a grit temper.[128] The sherd at Tawi Said (TWS18A-07465, no. 208) does not have vertical incised lines, but horizontal incised lines, but could nevertheless provide a useful comparison for this sherd. An open shape also dates to the Nabhani period. This bowl (TWS18A-00535) with a conical wall profile and a triangular lip (02.06.00, no. 180), to which one sherd of the coarse mineral-tempered ware with a painted surface belongs, is comparable to an artefact at BB-15, near Bisya.[129] It is described as an orange ware, with brown surfaces, a grit temper and comb incising. The sherd found at Tawi Said does not have the comb incisions but could nevertheless be from a similar manufacture.

An unglazed open shape that could date to the Middle Islamic period is a bowl with rims thickened on both the in- and outside (02.07.00, no. 181). One sherd (TWS18A-00844) of the coarse mineral-tempered ware is attributed to this type. The sherd is not decorated. This formtype has similarities to those at Qalhat.[130] This type is found at the ceramic workshop B41 and described as a local ceramic with a buff-pinkish red fabric, with a grog and lime temper. It is a wheel-made ware, of a medium quality, and the sherds produced at this workshop were found in all excavated areas,[131] thus indicating a date in the 14th century. Some other bowls also fit within this comparison. Three are coarse mineral-tempered ware sherds (TWS18A-00053, TWS18A-04926 and TWS18A-05111) of a bowl with a rounded wall and a triangular rim drawn out in the middle, which is flat at the top (01.12.00, no. 174–175). Two of these sherds have a slipped surface. Another open bowl, TWS18A-04422, with rounded walls and straight, medium-wide flared rim (01.08.00, no. 173) made of coarse mineral-tempered ware also fits within this comparison. Two coarse mineral-tempered ware sherds (TWS18A-00327 and TWS18A-00852) also have similarities to ceramics produced at this workshop (no. 226).[132]

A flask type that is present at Tawi Said are vessels with medium-long necks and an everted rim with a thinned lip (31.19.00, no. 92 and 217). Two sherds belong to this formtype that presumably date to the Middle Islamic period are a medium tempered mineral ware (TWS18A-07015) and a coarse mineral-tempered ware (TWS18A-06025). A similar ceramic ware for this formtype comes from Ras al-Hadd 3,[133] where it is described as a red-orange ware with a soapy texture and a grit temper. More information is lacking, with the exception that other sherds at Ras al-Hadd 3 date to the 11th and 12th centuries, and that the small port was eclipsed in the 13th century. Another formtype that also has similarities to Ras al-Hadd 3 are flasks with a medium-long neck and an everted rim with a rounded lip (25.04.00, no. 192). One sherd, with coarse mineral-tempered ware, belongs to this formtype (TWS18A-03720) and has a grey painted surface and a red-brown matrix. At Ras al-Hadd 3, this type is described as an orange-buff ware with a brown slip on the exterior and a sandy temper.[134]

2.4.5 The Late Islamic period

Most of the sherds from Tawi Said that date to the Islamic period are Late Islamic (c. 1650–1970 CE). There is a great variation of ceramic forms that were in use. One of the most common formtypes that can be attributed to the Late Islamic period are open bowls with a conical wall and a rounded, slightly thinned lip (02.05.00, no. 285, 292, 314 and 326–327). Of these, one is black glazed ware, five are yellowish-green glazed ware with black dots, five are yellowish-green glazed ware and two are (dark) green glazed ware. Similar bowls of this type can be found at Al-Zubarah,[135] Al-Ain,[136] Wadi Bani Kharus[137] and Wadi Andam.[138] Here, they are labelled as Bahla Ware, which is

125 Al-Jahwari 2008: 763, fig. 151F.
126 Al-Jahwari 2008: 594.
127 Whitcomb 1975: 153, fig. 11Q.
128 Whitcomb 1975: 152, fig. 11D.
129 Whitcomb 1975: 151, fig. 19A.
130 Rouguelle 2010: 315, fig. 9.19.
131 Rouguelle 2010: 312.
132 Rouguelle 2010: 315, fig. 9.8.
133 Whitcomb 1975: 149, fig. 9A.
134 Whitcomb 1975: 149, fig. 9B
135 Bystron 2019: 44 fig. 9b.
136 Živković *et al*. 2019: 4.
137 Whitcomb 1975: 141, fig. 5: A.
138 Al-Jahwari 2008: 772, fig. 160c–e.

generally characterised by its monochrome glaze, which varies from light olive green to greenish brown, and in most cases, shows signs of dark-coloured dots. The ware has frequently been found in southeastern Arabia and its place of manufacture is suggested to be in Bahla, Oman. The current date range is between the 16th and 20th centuries.[139] Another common Late Islamic shape at Tawi Said are open bowls with a rounded wall and a rounded, slightly thinned lip (11.14.00, no. 286 and 294–295). Nine of these sherds belong to the yellowish-green glazed ware with black dots and one to the black glazed ware. Similar bowls of this type can be found at Wadi Andam,[140] Wadi Bani Kharus,[141] Al-Ain,[142] Al-Balid[143] and Khashm Nadir.[144] The yellowish-green glazed ware with black dots can again be recognised as Bahla Ware. The same goes for the bowls with a steeply conical wall and rounded lip (12.02.00, no. 296). There are three sherds which are again a yellowish-green glazed ware with black dots. The sherds belonging to this ware-formtype are similar to those at Wadi Andam.[145] To the formtype of bowls with steeply rounded walls and rounded lip (01.01.00, no. 288), three sherds with yellowish-green glazed ware with black dots are noted. The glazed wares have similarities to those at Khashm Nadir[146] and Al-Zubarah,[147] where they are identified as Bahla Ware. Of the porcelains, one sherd (TWS18A-05521, no. 342) has similarities to Persian fritware, dating to the 18th century.[148] For formtype 01.03.00 (no. 312), the rounded bowls with a thinned lip, a similar artefact was found for one yellowish-green glazed ware sherd at Khashm Nadir. This artefact is described as Khunj Ware, with a brick red-core shading to grey and a mottled yellow glaze with speckles of cinnamon glaze, dating to the 18th century.[149] Khunj Ware within the region, is often the same as Bahla Ware.[150] A closed vessel form that has could also be identified as Bahla Ware is a flask form with a drawn-out rim (30.38.00, no. 317). One sherd (TWS18A-00551) belongs to the yellowish-green glazed ware and has similarities to a Bahla Ware vessel found at Wadi Andam,[151] dating to the Late Islamic period. Another bowl-shaped sherd with rounded walls and pointed, slightly tapering lip, TWS18A-03742 (01.15.00, no. 325), which is described as (dark) green glazed ware, also has similarities to those at Wadi Andam[152] with a Bahla Ware rim.

Cups with rounded walls and a slightly thinned lip (25.03.00, no. 191 and 298) occur several times in the ceramic assemblage. In two cases, the complete surface is painted. Two sherds are yellowish-green glazed ware with black dots, and are very likely to also be Bahla Ware; however, no similarities elsewhere were found for these glazed sherds. Parallels for the seven coarse ware sherds were found at Al-Mataf,[153] where it is described as an unglazed Persian cooking vessel made of orange-red earthenware and with rims painted in maroon wash, date to the 17th century. Another similar type comes from Bisya BB-15,[154] which is described as grey ware, with dark red surfaces with black smudges, burnishing on the interior and exterior and a heavy grit temper.

Within the Tawi Said ceramic dataset, the major ware group, the coarse mineral-tempered ware (ware 30), is suggested to be largely Late Islamic. Since it is relatively difficult to find similar artefacts to compare to these sherds, due to the crudeness of the ware and usually the lack of decoration, they are mostly presumed to be local. For a few of the formtypes within this ware, some tentative similar comparisons have been found within the literature, which will be discussed below. One coarse mineral-tempered ware sherd belonging to the formtype of bowls with a rounded wall and a rounded lip (01.02.00, no. 171) has a comparable artefact at Wadi Bani Kharus 1, where a sherd with the same form is described as a light orange ware with a rough texture and a red grit temper.[155] Sherds from this site date to the early Islamic period (630–1055 CE); however, a Late Islamic reuse of the site is also suggested. The unglazed wares, as is this sherd, especially cannot be safely classified as either Early or Late Islamic.[156] Another closed-shape flask, for which a comparable object was found, are ones with a medium-long, inwardly conical neck and a flattened lip (31.24.00 no. 219). The five coarse mineral-tempered ware sherds are similar in shape to a specimen of red ware, collected at Al-Balid.[157] At Al-Balid, this ware is described as a local tableware, consisting of bowls, dishes, jugs and small storage jars, as well as some pots. The fabric is fine and the sherds are characterised by smoothed, burnished, polished surfaces that are frequently decorated with incisions, impressions and red painting. The red wares were presumably produced at the Salalah plain and could be dated between the 14th–18th century, where they are best represented in the assemblage during the 17th and

139 Power 2015: 28; Zivkovic *et al*. 2019: 1–2.
140 Al-Jahwari 2008: 772, fig. 160c.
141 Whitcomb 1975: 141, fig. 5A.
142 Živković *et al*. 2019: 4 fig. 2.
143 Fusaro 2020: 82, fig. 19d.
144 Hansman 1985: 57, fig. 12l.
145 Al-Jahwari 2008: 772, fig. 160d.
146 Hansman 1985: 57, fig. 12n.
147 Bystron 2019: 44.
148 Hansman 1985: 59, fig. 13c–d.
149 Hansman 1985: 57, fig. 12n.
150 Živković *et al*. 2019: 1.
151 Al-Jahwari 2008: 772, fig. 160B.
152 Al-Jahwari 2008: 772, fig. 160C–D.
153 Hansman 1985: 54; 59 fig. 13q.
154 Whitcomb 1975: 151 fig. 10S.
155 Whitcomb 1975: 143, fig. 6N.
156 Whitcomb 1975: 125–126.
157 Fusaro 2019: 135, fig. 4E.

18th century.[158] The sherds found at Tawi Said do not show evidence for red paint, but the fabric and formtype of at least three of the sherds is very similar to what is described as red ware. Flasks with a medium-length neck and a flared rim (30.28.00, no. 204) with a coarse mineral temper, occur four times within the Islamic ceramic dataset. These sherds also have likely similarities to those at Al-Balid.[159] The grit-tempered ware at Al-Balid is a local coarse ware and consists of kitchen vessels that are related to food preparation, with often unfinished surfaces. There are also vessels of this type that have a less coarse fabric and have decorated surfaces, which were presumably used more for the preparing, serving and storing of food. The grit-tempered ware is best represented during the 14th and 15th centuries CE.[160]

One jar-type with a drawn out, almost folded, rim (30.39.00 no. 88), of which one sherd with a medium tempered mineral ware was documented at Tawi Said (TWS18A-01293), and has a similar form to some at Muharraq, Bahrain.[161] At Muharraq, this type is described as a Torpedo Jar, which was found in all the trenches (7th–8th century and 19th–20th century CE), and is a common type of amphora with a brown sandy fabric, that was sometimes lined with bitumen and likely originally contained wine.[162] Another jar-type that occurred in the Tawi Said assemblage is a jar with a drawn-out rim and a flattened lip (31.31.00 no. 34 and 221). One sherd belongs to this form-type, and it consists of fine, small to medium sand-tempered ware (TWS18A-00155). This sherd has horizontal incisions and a beige slip covering the outer surface. It appears similar to an 'Ali ware sherd documented at Muharraq.[163] This ware is described as a cream-coloured fine pottery, which was common during the 18th to 20th century at Muharraq, with a suggested origin in Bahrain.[164]

One very common ceramic ware that was widespread in southeastern Arabia during the Middle and Late Islamic period is Julfar Ware.[165] This is a coarse ware that is handmade or made on a slow wheel, with a dark orange or grey body and a rough, hackly fracture. Forms consists mainly of cooking pots, but there is also evidence for bowls, jugs and storage jars.[166] At first glance this ware does not seem to be present at Tawi Said. However, there are two sherds (TWS18A-05400_1 and TWS18A-05400_2, no. 266) that belong to handmade bowls with a steep upper wall course and a flattened lip (02.07.00) which appear very similar to a Julfar ware bowl that was found at Al-Mataf.[167] This bowl is described as having a red-brown core, a cream slip and maroon decoration on the outside, and it is dated to the 16th century. The two sherds at Tawi Said do not have any form of decoration, but are nevertheless similar in shape.

Some sherds find similarities to others based on decoration instead of formtype. Eleven sherds have been decorated by comb incisions in various directions. These are all classified as ware 70 (no. 343–345). This ware has similarities to Coarse White Ware, as defined by Power[168] and to Combed Ware as classified by Al-Jahwari.[169] At Al-Ain, this ware was introduced between 1720 and 1790, but is most prominent between 1870 and 1920.[170] From ethnographic evidence at Manah, it has been documented that these vessels are used as water jars (*jahlah*) during the early- to mid-20th century.[171]

Another negative decoration technique which is recorded several times at Tawi Said are incised wave lines (TWS18A-03535, TWS18A-03988, TWS18A-00277, TWS18A-06013, TWS18A-06015, TWS18A-04615, TWS18A-05625, TWS18A-04657 and TWS18A-06529, no. 71–72, 98, 115 and 253–255). Similar decoration is recorded at Bahla during the late 20th century. This decoration can be found on unglazed large jars (*khars*) for storing dates, grain and other dry goods, water jugs (*ibriq*), water jars (*jahlah*), drinking cups (*mashrab*), coffee pots (*dallah*) and bowls (*sahn*) for serving food and *halwa*.[172] As many as three to five parallel lines can be incised in straight, wavy, zigzagged or cross-hatched bands. Dash-like impressions are also known, as well as broken lines or dots.[173] The wave decoration is also evident at Saham in the early to mid-20th century[174] and at Mahyah during the mid-20th century.[175] A row of fingernail impressions as decoration occurs on one sherd (TWS18A-06000, no. 119), which is also evident at some of the unglazed jars manufactured in Bahla.[176] The combination of a chain ridge decoration and incised decoration also occurs in the Tawi Said dataset (TWS18A-07459, TWS18A-07464, no. 259–260), for which a possible similarity to an artefact at Mahyah could be found, which is a storage jar (*khar*) that dates to the 20th century. There is evidence for one sherd to have likely functioned as an incense burner (TWS18A-06008_1, no. 17). It is similar in shape

158 Fusaro 2019: 132.
159 Fusaro 2019: 134, fig. 3E.
160 Fusaro 2019: 136.
161 Carter – Naranjo-Santano 2011: 43, fig. 36: 1.
162 Carter – Naranjo-Santano 2011: 40.
163 Carter – Naranjo-Santano, 2011: 47, fig. 40: 7.
164 Carter – Naranjo-Santano 2011: 48.
165 Mitsuishi – Kennet 2013.
166 Mitsuishi – Kennet 2013: 3.
167 Hansman 1985: 71, fig. 15K.
168 Power 2015: 6.
169 Al-Jahwari 2008: 1002 pl. 433.
170 Power 2015: 24.
171 Richardson – Dorr 2003: 499 fig. 414.
172 Richardson – Dorr 2003: 498–499, fig. 407.
173 Richardson – Dorr 2003: 148.
174 Richardson – Dorr 2003: 500 fig. 416–417.
175 Richardson – Dorr 2003: 501 fig. 427, 502 fig. 430–431.
176 Richardson – Dorr 2003: 499 fig. 407, 410, 411.

Fig. 19: TWS18A-00247 *in situ*.

with incised/perforated decoration as incense burners (*majmar*) found at Musilmat in 1999 and at Lima, eastern Musandam in the mid-20th century.[177]

In summary, if we consider the Islamic period, most of the ceramic dataset belongs to Late Islamic times. Some pottery dates to the Early and Middle Islamic periods, which is especially testified by the Turquoise Glazed Ware and the sgraffiato sherds. The large number of coarsely mineral-tempered ware sherds is typical for Islamic sites in the region and indicate some local craftmanship during the Islamic period. There are also some examples for regional ceramics, mainly in the form of Nabhani wares during the Middle Islamic period as well as the Bahla Ware and the comb-incised wares in the Late Islamic period. Only a few long-distance imported wares are present, in the Early Islamic period in the form of the Turquoise Glazed Ware, in the Middle Islamic period with sgraffiato ware, and in the Late Islamic period through the porcelain sherds.

2.5 The spatial distribution of the ceramics

Based on the chronological classification of the ceramics presented above, the spatial distribution of the ceramics can be plotted (Fig. 20). Only the sherds for which a secure or a possible date can be discussed are shown on the distribution map. There seems to be a clear concentration of Wadi Suq sherds in the centre of the survey area, west of the sand dune. The Islamic period sherds are more dispersed over the area, but they are mainly concentrated in the north- and southeastern parts. Thus, there appears to be a clear spatial separation between the ceramic distribution during the Bronze Age and the Islamic period.

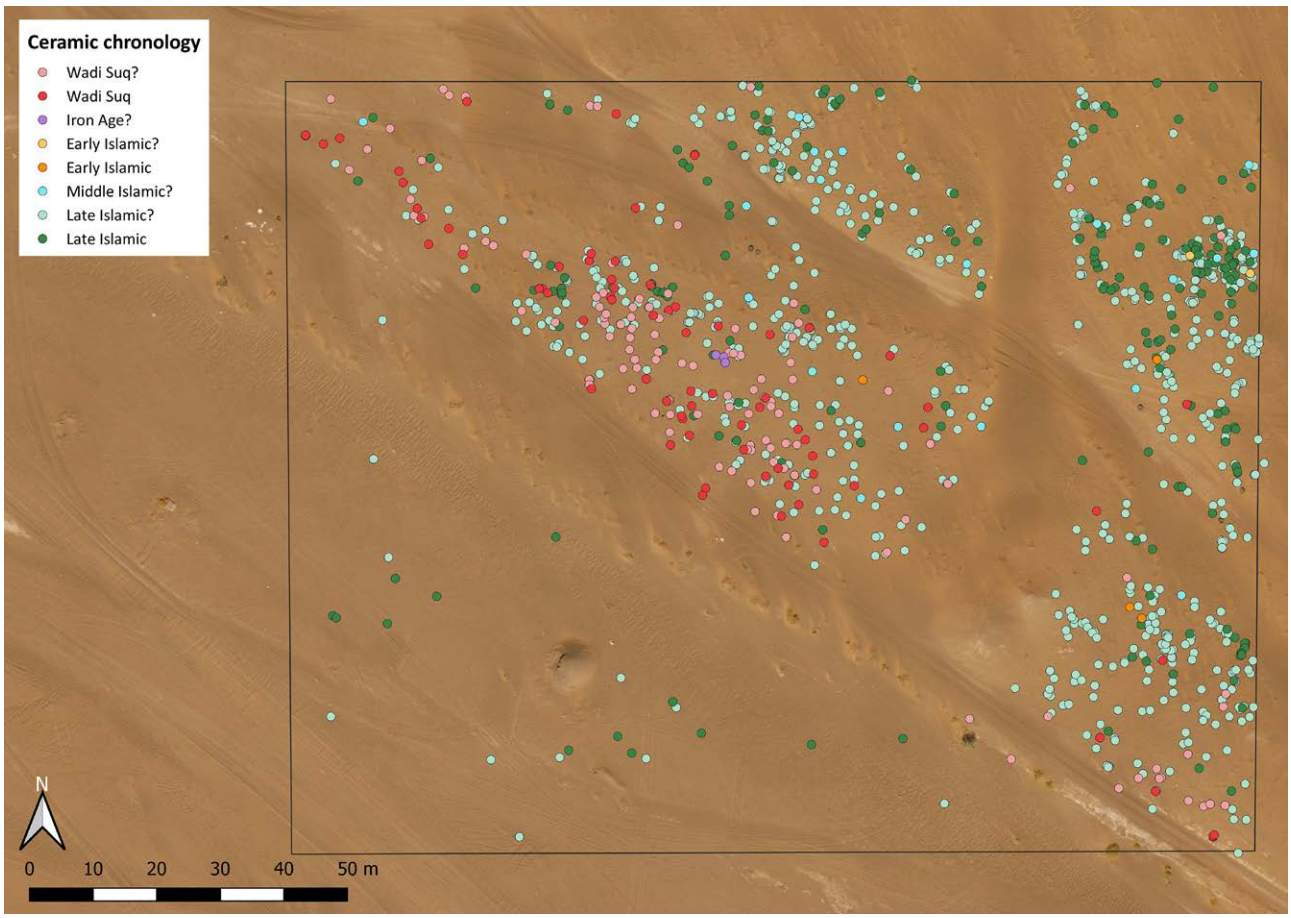

Fig. 20: Chronological ceramic distribution at Tawi Said.

177 Richardson – Dorr 2003: 494 fig. 385, 502 fig. 436.

3 The lithic remains (Maria Pia Maiorano)

During the survey in Tawi Said, 336 lithic artefacts were found. They primarily consist of knapping debitage elements and retouched pieces constituting 1/3 of the total. The main categories of collected material are summarised in Table 9. The results of the lithic analysis were used to highlight the main technological and typological features emerging from this almost homogeneous surface collection. Once these patterns were recognised and known, initial comparisons between different assemblages and samples were attempted.

Artefact category	No.
backed bladelets	1
bifacial pieces	4
borers	3
burins	3
chips	12
chunks	30
composite tools	12
core-trimming elements	4
denticulates	5
microliths	5
cores	9
notches	12
retouched blades/bladelets	5
retouched flakes	30
scraping tools	7
blades/bladelets	11
flakes	183
Total	**336**

Tab. 9: Lithic artefacts' main categories.

3.1 Raw material

The raw material exploited at Tawi Said is diverse. The Hawasina-type radiolarian red-brown and opaque chert (similar to that of Al-Haddah, BJD-1 and Ras al-Jinz)[178] is dominant and it is associated with greenish, yellow or purple radiolarites, but also translucent chert. The material is mainly middle Triassic and Triassic cretaceous chert coming from the Umar and Hamrat Duru group reported on geological maps in the westernmost part of Jebel Khadar massif, 20–25 km far from the site, and the interdunal areas west of the site (Fig. 21). Its great diversity suggests that the raw material may come from different geological outcrops in the shape of pebbles carried by the seasonal wadi floods. However, no traces of

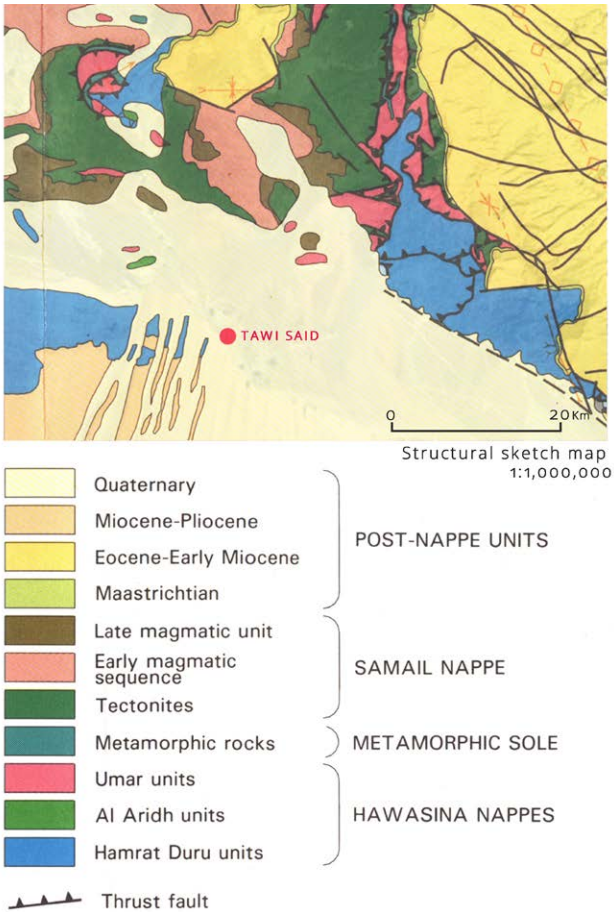

Fig. 21: Geological structural sketch map of the area between the Hajar Mountains and the fringes of the Wahiba sands. In dark pink, the Hawasina-type radiolarian chert deposits (modified after Wyns *et al.* 1992).

178 Charpentier *et al.* 1997; Maiorano 2020.

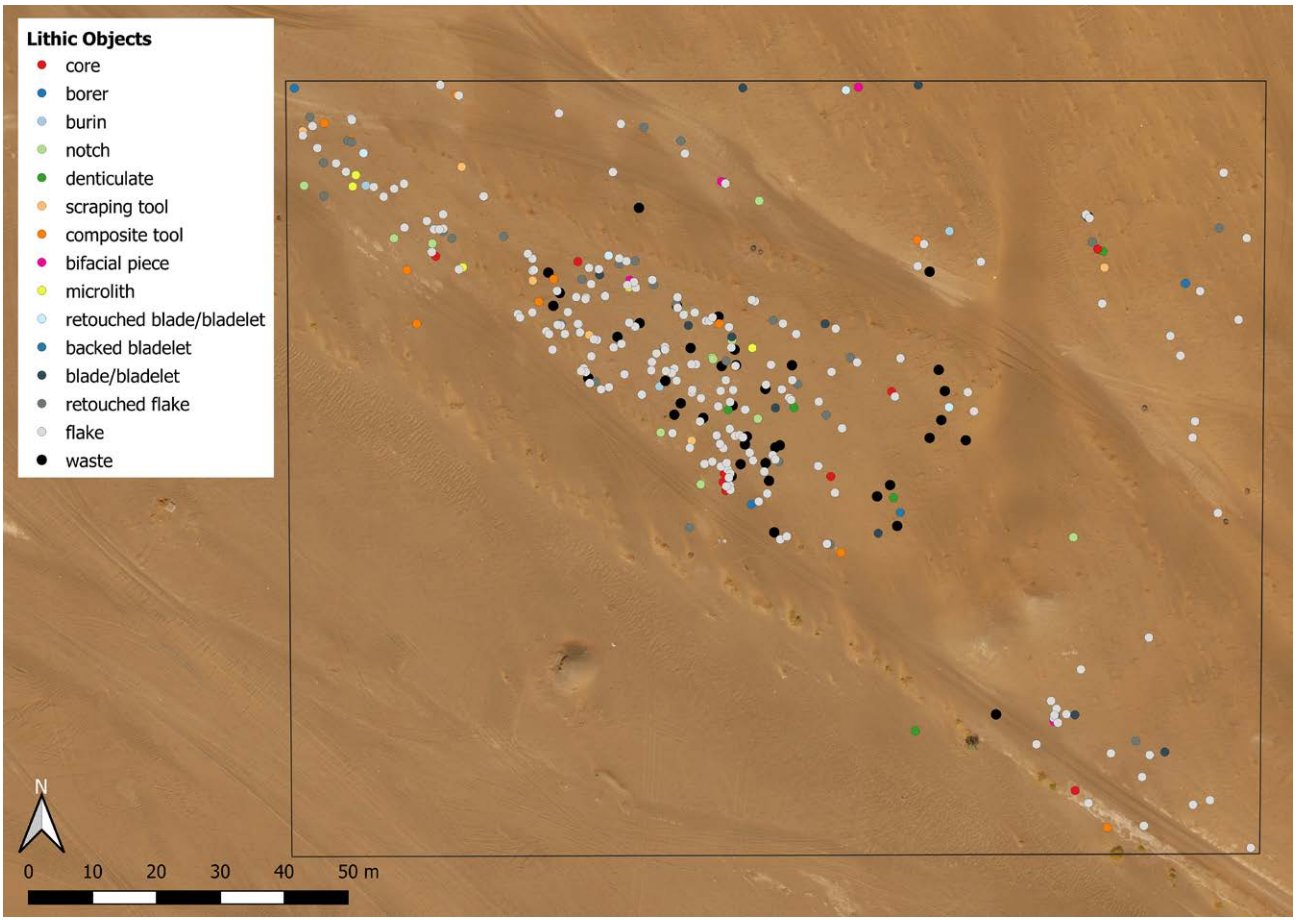

Fig. 22: Spatial distribution of main categories of the collected lithic remains.

chert blocks and pebbles were found on the field during the survey and the amount of artefacts with cortex is extremely low. This might indicate that raw material was collected in other places, decorticated and carried to the site for the subsequent reduction phase. However, a punctual survey for detecting the actual raw material outcrops will be part of future survey projects.

3.2 Debitage

A flake and laminar flake-oriented industry characterises the debitage. Large artefacts are extremely rare, as opposed to the coastal areas' assemblages of the same region (e.g., Suwayh SWY-2, Ras al-Hadd and Ras al-Jinz).[179] A full technological study of the lithics from Tawi Said was made impossible by the usual complexities given by the superficial nature of the site, the high dispersion of the few artefacts and the absence of consistent reduction clusters. However, a first interpretation was made based on a techno-typological study and other artefacts collected in the area. The complete lithic sample is composed of 336 pieces. The corpus comprises a considerable number of flakes (of which we count 183), a few broken blades and bladelets, three fragments of bifacial pieces, cores, scraping tools, notched and denticulate pieces, and undiagnostic retouched fragments. The blades collected at the site are generally elongated flakes with parallel edges and dorsal flake scars aligned to the blank's long axis. Cores were reduced using a unidirectional strategy from an unprepared platform or with a multiplatform – typically opportunistic – strategy (Fig. 24). Some of them could have been used as ad hoc hammerstones as they exhibit crushing, fractures, and other damage from use as a hammerstone (Fig. 24E, H).

The lithic artefacts were found on the surface, scattered all over the surveyed area, but most of them came from the central zone in occurrence with the concentration of the sole Wadi Suq pottery (Fig. 22). However, its chronological determination warrants caution due to the absence of previous publications of studied lithic assemblages dated to this period. Moreover, the unsuccessful attempt to directly date the site deposit limits the interpretation of the context and the technological aspects.

179 Charpentier 2001; Hilbert – Azzarà 2012; Borgi *et al*. 2012.

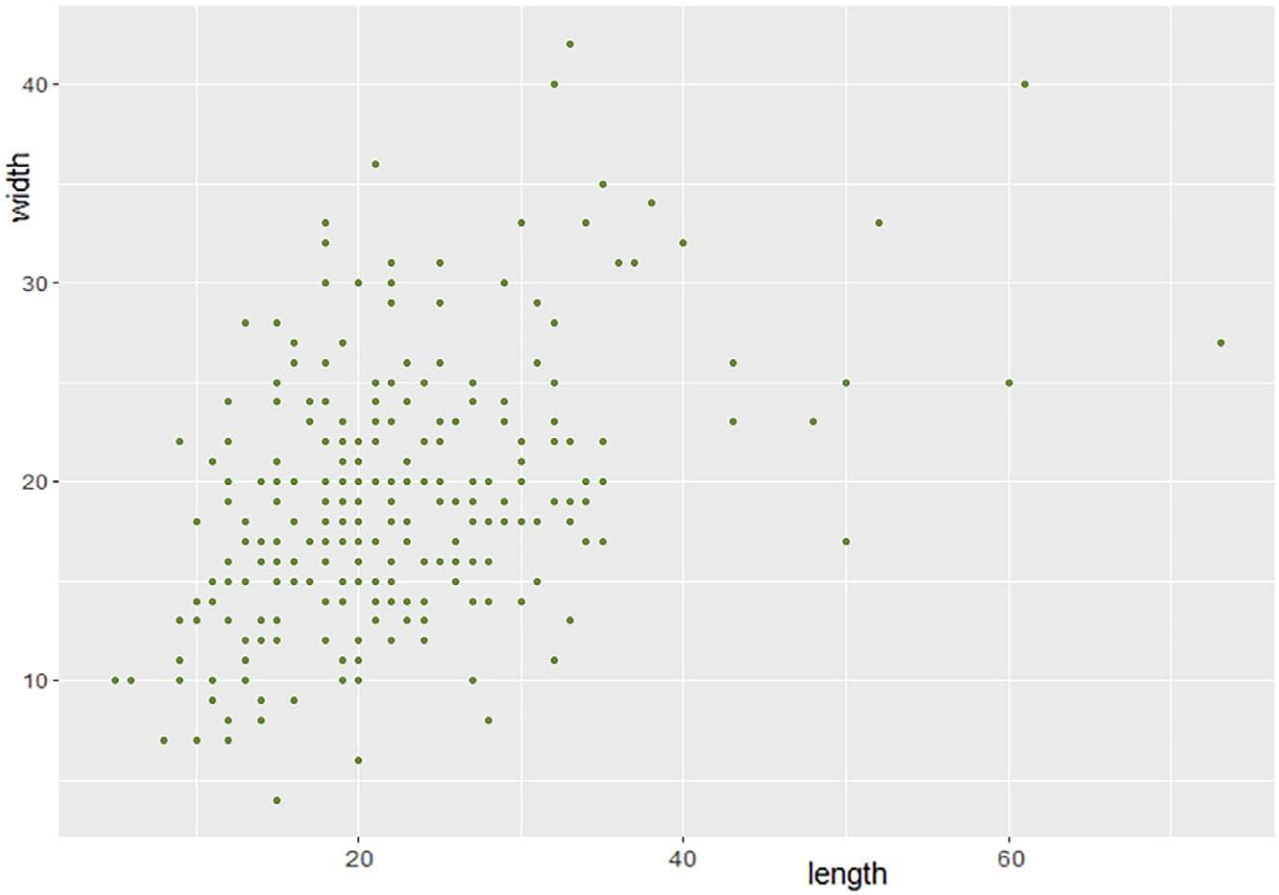

Fig. 23: Distribution of lithics artefacts from Tawi Said based on their maximum length–width variation. Measurements are reported in mm.

3.3 Artefacts

Flakes show a variable thickness with generally flat striking platforms, simple dorsal scar patterns and rectilinear longitudinal cross sections. Bulbs of percussion are wide and thick and sometimes broken, as commonly happens when direct percussion with a hard stone hammer is applied. They vary in size and shape and show several flaking errors. The retouch varies from marginal to invasive and it is mainly direct, although the combination of direct and inverse retouch characterises 20 % of the retouched artefacts. Several of the collected flakes preserve microfracturing along their ventral or dorsal edges appearing as a small, unpatterned retouch, extending no more than 2 mm, that indicates use-related or taphonomic damage.

Short blades (max. length 73 mm), bladelets and laminar flakes were found at the site (Fig. 24) together with end and side scrapers made on flakes or blade blanks, and some microlithic retouched flakes (Fig. 25). Blades from the site are, for the most part, short, irregular and varying in thickness. Multipolar and multi-platform cores were found as well. Indeed, the absence of specific preparation of the cores and the unorganised exploitation of the volumes resembles the typical opportunistic reduction method used in most of the Bronze Age and later periods.[180] Moreover, the raw material is present in the shape of small pebbles and nodules, limiting the production of larger or longer blanks.

Notches and denticulates are the second most common class of artefacts. They have been manufactured from a wide range of blanks, mainly thick flakes and laminar flakes, and do not show any standardisation. The retouch was performed by direct percussion, consisting of crude irregular deep notching, repeated notching, or the rough detachment of steep flakes (Fig. 25, Fig. 26 and Fig. 27).

The foliate bifacial pieces found at Tawi Said could be dated to the Middle Neolithic.[181] They most likely broke during the manufacturing process, as shown by the typical bending fracture visible in the section.[182] Moreover, they were both preforms as showed by the partial retouch on biface A in Figure 29. Manufacturing was carried out, at least in its final stages, by direct soft percussion (Fig. 29B) or pressure (Fig. 29A). However, the absence of other bifacial pieces and thinning flakes

180 Maiorano 2020; Lischi – Hilbert 2020.
181 Charpentier 2008.
182 Tsirk 2014.

confirms that this area was principally occupied during later periods.

Scrapers are not standardised and often irregular, highly variable in size, shape, and manufacture, following ad hoc technology. The collected scrapers represent a range of variable shapes with a few classical diagnostic types (Fig. 28). The difference between end and side scrapers lies in the position and frequency of the distal/lateral retouch. It is mainly semi-abrupt, sometimes scalar, on thick flake blanks. It is also continuous in

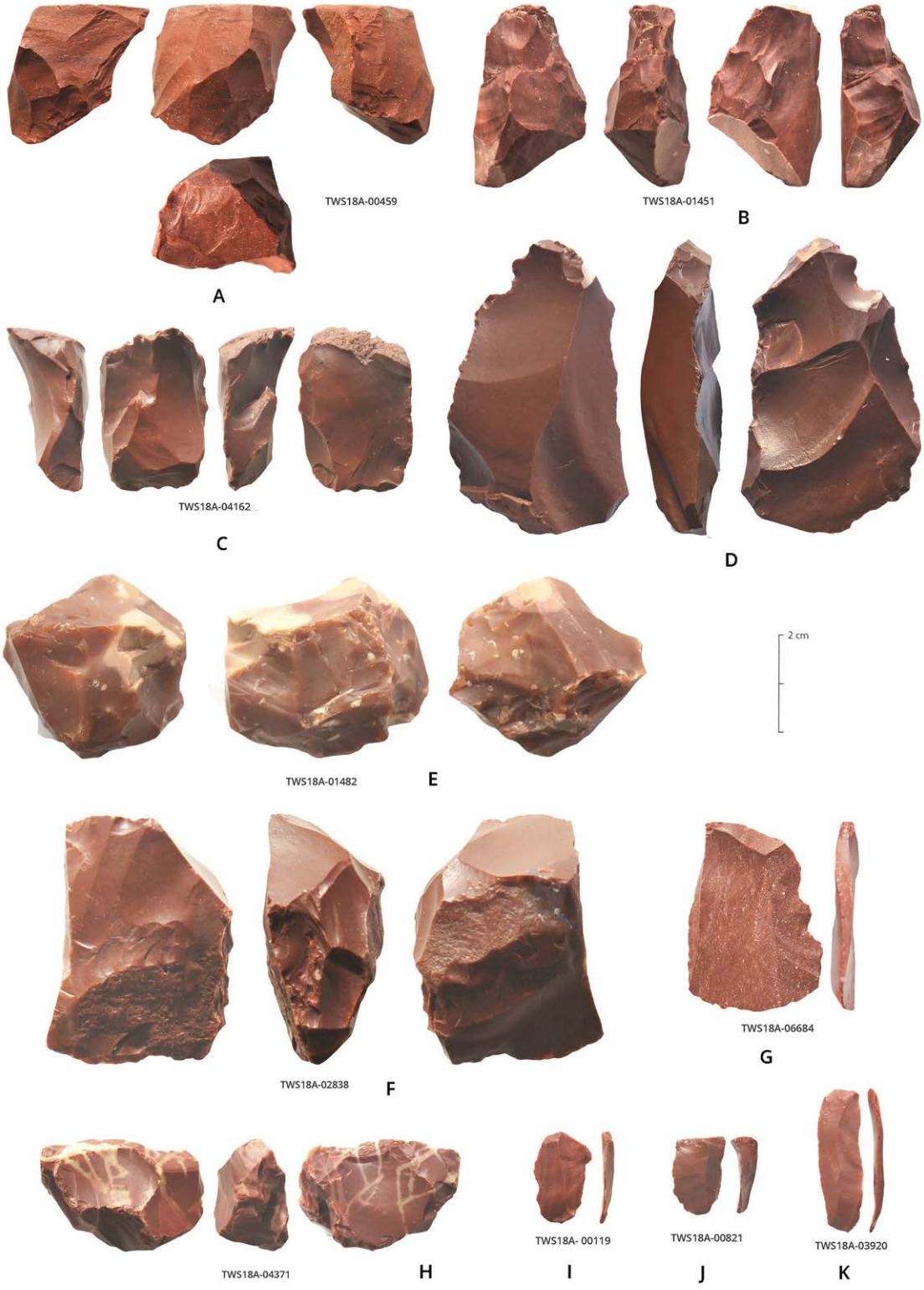

Fig. 24: Lithic artefacts from Tawi Said. Multiplatform cores (A, B, E, F, H); multiplatform cores on flakes (C, D). Blanks: flakes (G, I, J) and bladelet (K).

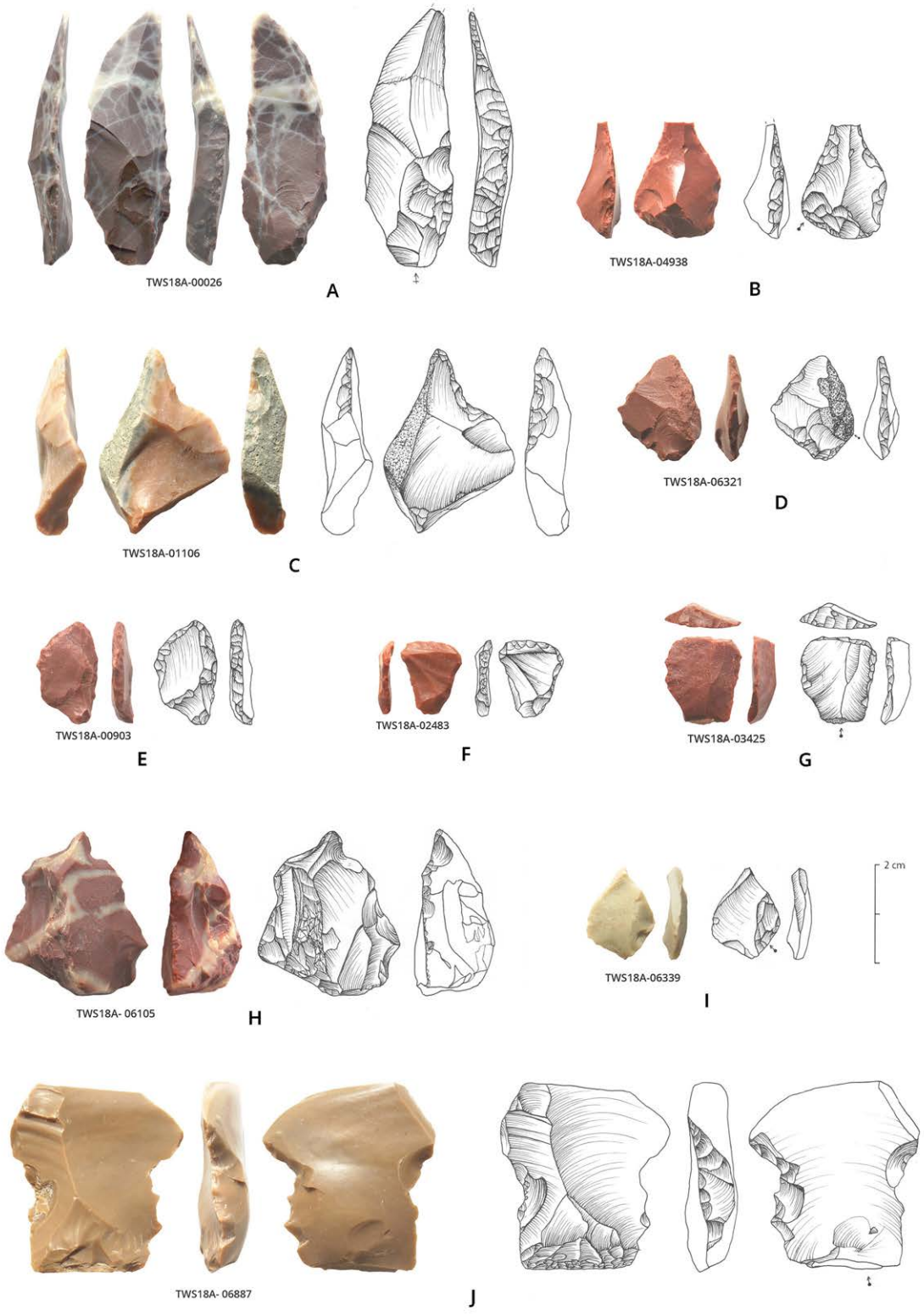

Fig. 25: Backed bladelet (A); borers (B, C, H); microlithic tools (D, E, F, G); burin (I); notch (J).

some specimens but in most cases discontinuous and primarily dorsal. A scraper made on a circular flake shows a continuous retouch on the distal end (rectilinear, Fig. 28C), while the elongated side scraper made on a regular bladelet (rectilinear, Fig. 28B) has continuous retouch along both edges with some differences. The right side has a central semi-abrupt scalar rectilinear retouch, the apical shows marginal modification, while the left edge shows an alternation of convex and concave portions. Most likely it was a multifunctional tool.

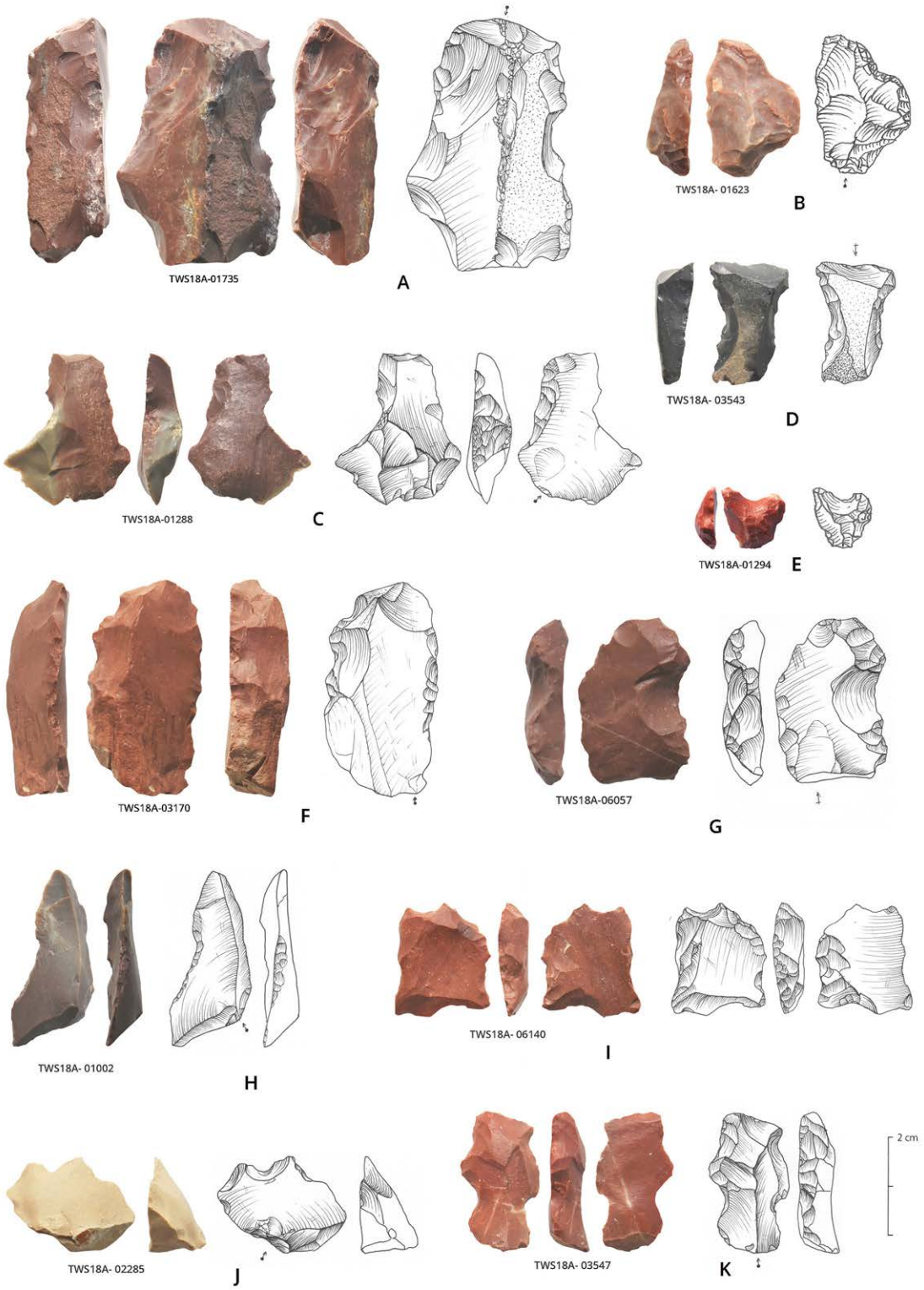

Fig. 26: Notches (A, B, E, G, H, J, K); composite tools (C, D, F, I).

Burins represent the smallest category and are generally small flakelets with single or double burination on the distal end (Fig. 25I).

The three borers (or perforators) are highly different in size, shape and modification of the tip. Differing from the first one that seems modified by regular continuous semi-abrupt retouching (Fig. 25B), the second is shaped by abrupt retouch (Fig. 25C) and the third is mainly created by the intersection of two deep notches (Fig. 25H).

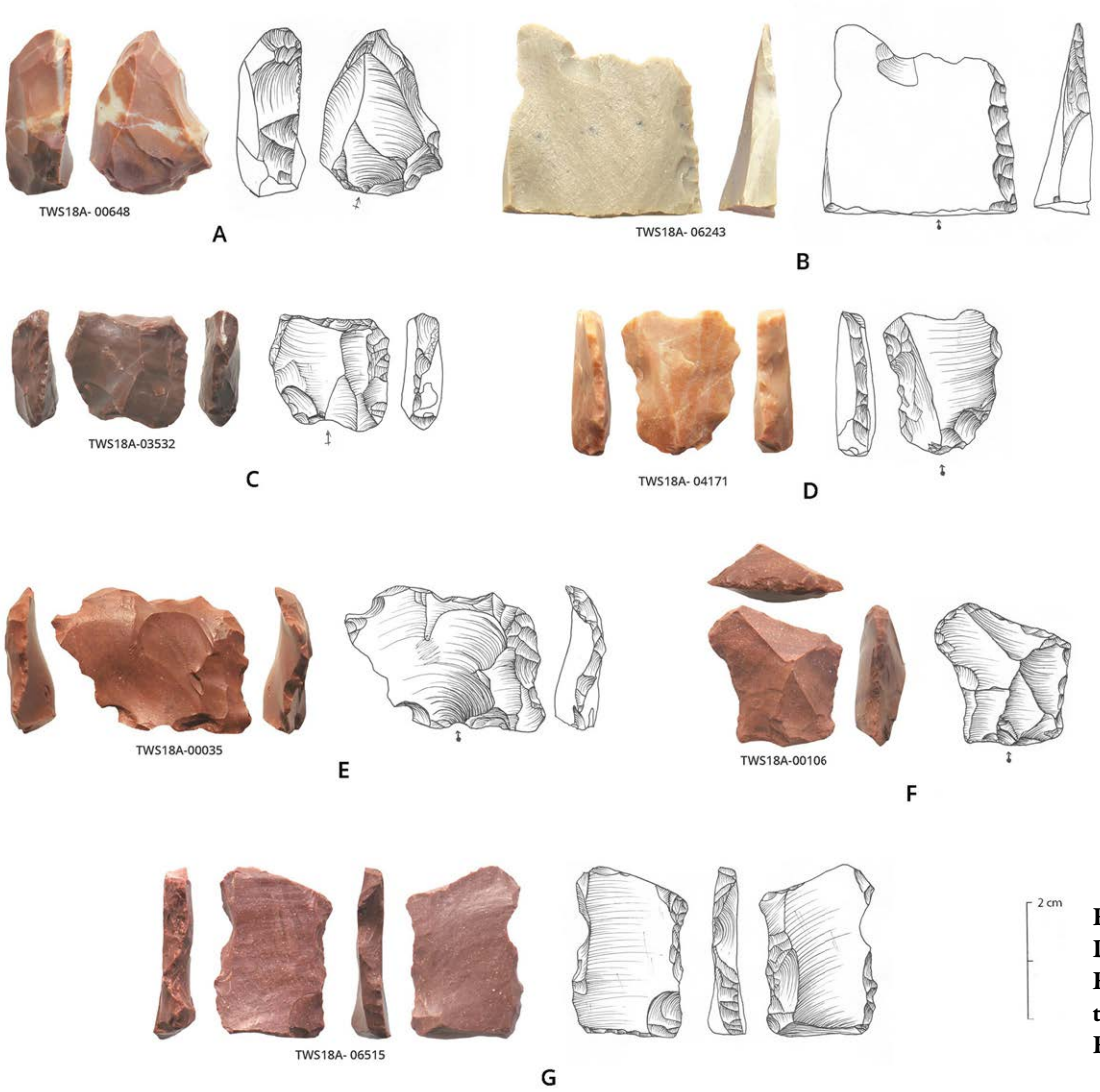

Fig. 27: Denticulates (A, E); composite tools (B, C, D, F, G).

Composite tools are also reported in the assemblage. These retouched tools combine the properties of other categories, such as notches, truncations and scrapers. These notched scrapers were made on flake blanks with a steeply retouched edge or notch at their distal end and lateral modifications (Fig. 25 and Fig. 27).

3.4 Summary

The analysis of the lithic assemblage led first to a categorisation of opportunistic flake-oriented products on local chert, marked by the minimal preparation of knapping procedures with the aim of producing ad hoc tools.[183] The ad hoc nature of the sample made a chronological definition, solely based on the techno-typological analysis, extremely difficult. The absence of any preparation of the platforms caused frequent hinge fractures. The blank production for manufacturing the artefacts collected at the site did not require any constraints and almost all the debitage products recall a low level of predetermination resulting in the production of several flakes, scraping tools and rough notches likely used as secondary tools made for immediate use and discarded. Explicit functional interpretation of the lithics is not possible due to its great variability and the post-depositional modifications. Overall, the lithic remains were all recorded in the central zone in occurrence with the Wadi Suq pottery sherds concentration (Fig. 23). Based on the techno-typological similarities with other southeastern Arabian Neolithic and Bronze Age assemblages documented in Oman,[184] it can be assumed that artefacts retrieved at Tawi Said are technologically datable to the Bronze Age, and most likely to the Wadi Suq period, as indicated by the presence of such pottery remains. Despite the absence of published lithic assemblages related to other Wadi Suq sites in the region, this assemblage seems

183 Andrefsky 1994; Rosen 1997.

184 E.g., Uerpmann M. 1992; Charpentier *et al.* 1997; Charpentier 2001; 2008; Biagi 2004; Azzarà – Hilbert 2012.

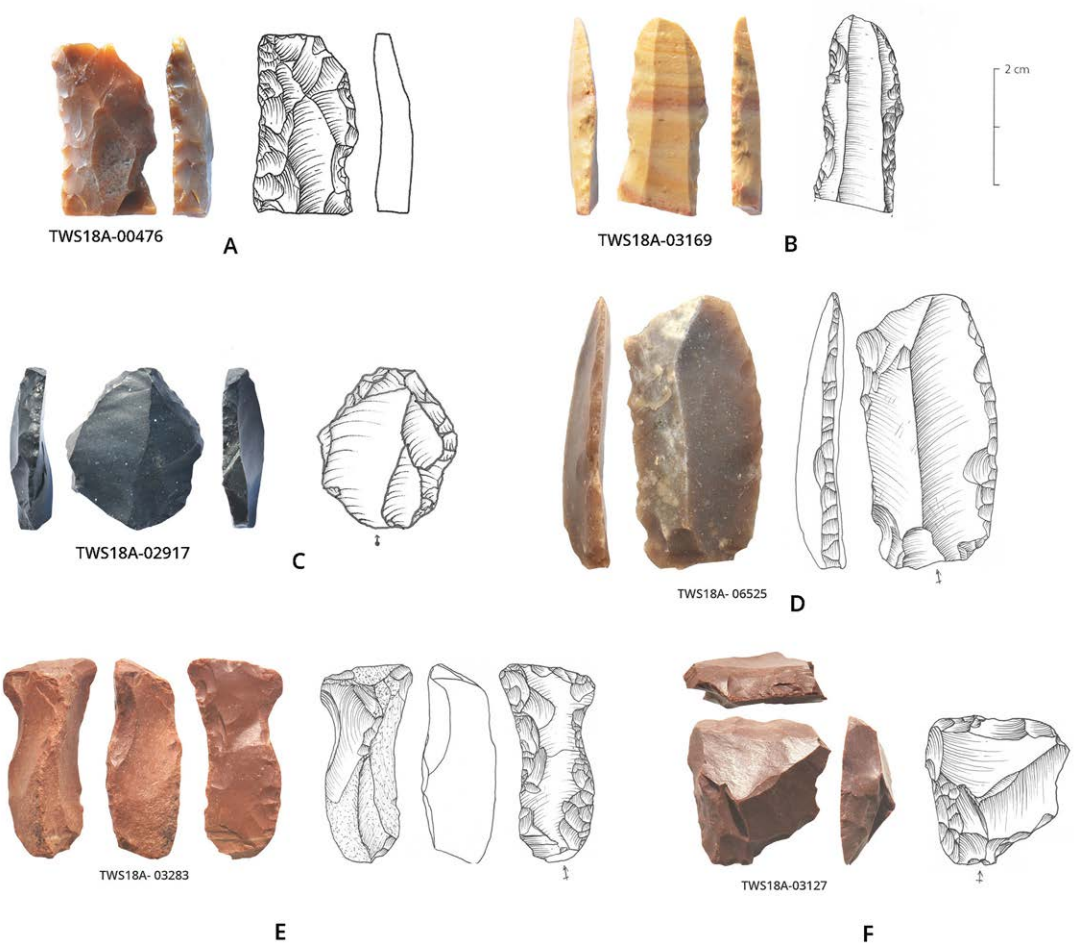

Fig. 28: Scraping tools.

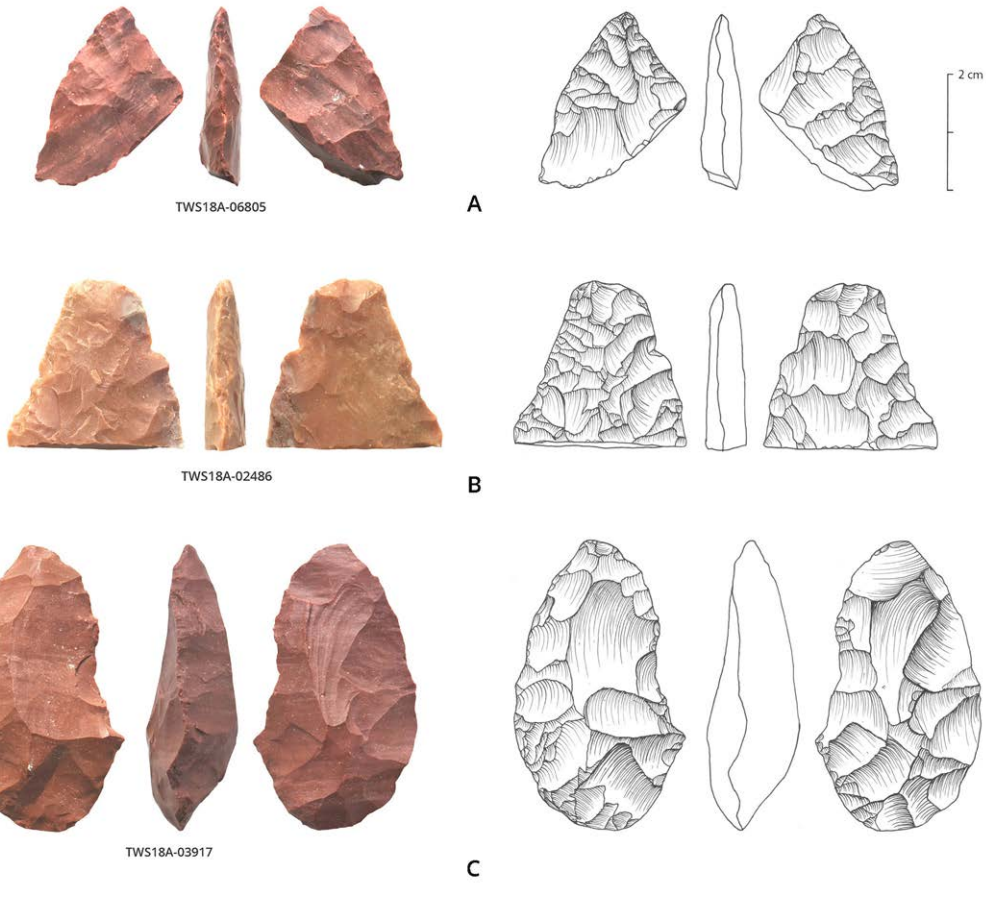

Fig. 29: Bifacial foliates (A, B); bifacial piece (C).

to inherit the approach to lithic manufacture already developed during the Bronze Age, where scrapers, notches and drills occur in all assemblages, together with an ad hoc approach towards material exploitation. This assemblage is the first to be published for the Wadi Suq period, but the survey and excavation proceedings in the interior of Oman (led by several international teams) might soon provide substantial additional data and comparisons.

4 Personal Adornment (Stephanie Döpper)

49 pieces of personal adornment have been found in the 2018 Tawi Said survey (Fig. 30). These include 31 beads, nine pendants, seven glass bangle fragments and two shell ring fragments. Personal adornment pieces are more or less evenly distributed throughout the survey area, with the exception of the wadi and the low sand dunes in the east. Here, generally very little finds were made. The chronological attribution of most objects is difficult because of their simple shape and comparisons from a wide range of contexts. Only the glass bangles can be safely attributed to the Islamic period after the 15th century CE. Interestingly, most of them concentrate on the northeastern corner of the survey area.

4.1 Beads

The typology of the beads follows the one used in Bat.[185] Each item is classified according to its longitudinal section and cross section as well as its decoration. Together with

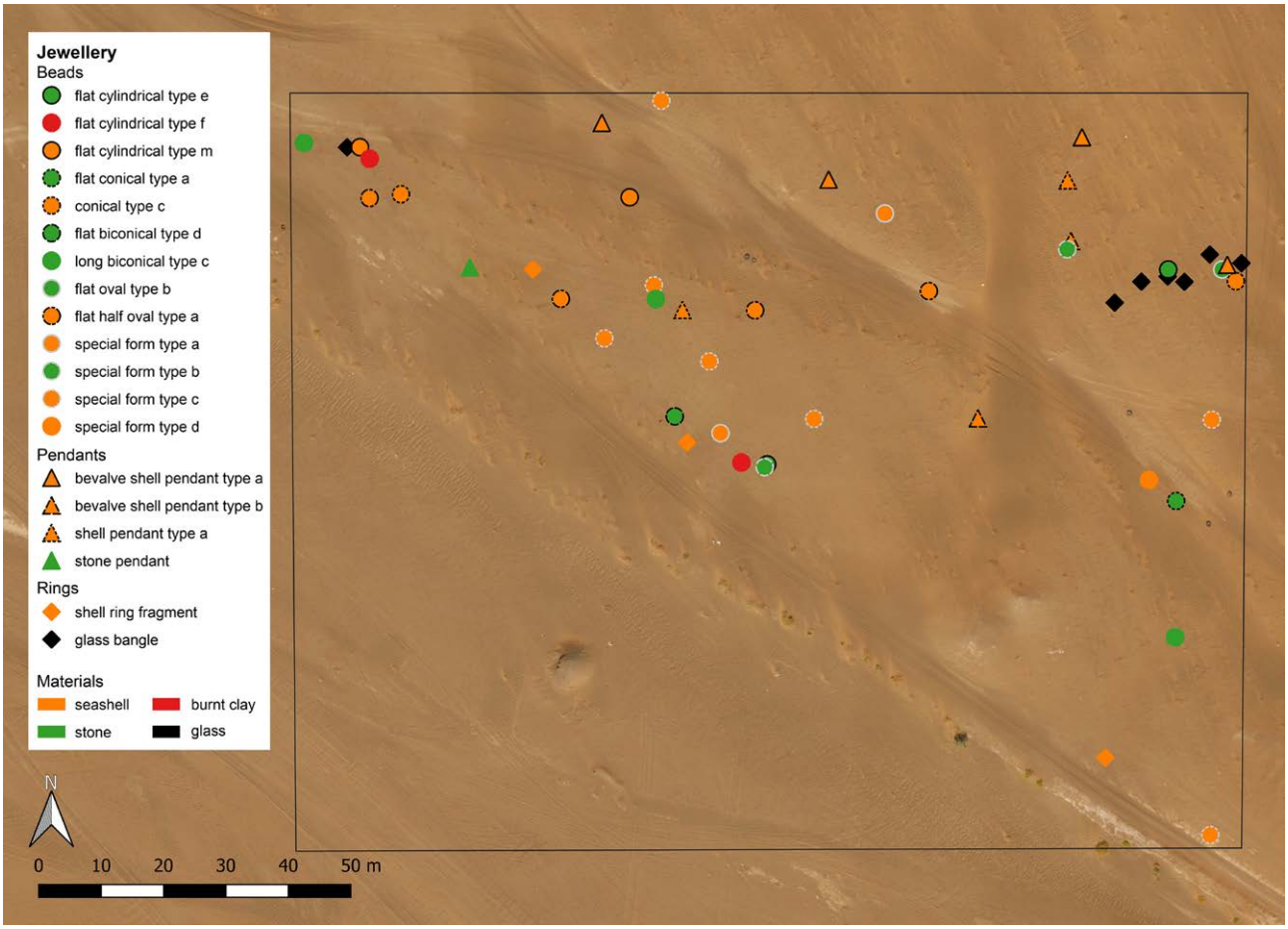

Fig. 30: Distribution map of personal adornment items at Tawi Said.

185 Schmidt 2020: 13–15.

other characteristics such as size, colour and material they are attributed to a type. 13 different types were identified at Tawi Said, represented by between one and seven objects each. The most common material for the beads is seashell which accounts for 17 pieces. Ten beads are made of undistinguished stone of different colours, two of burned clay and one each of carnelian and calcite.

4.1.1 Flat cylindrical beads: Type e

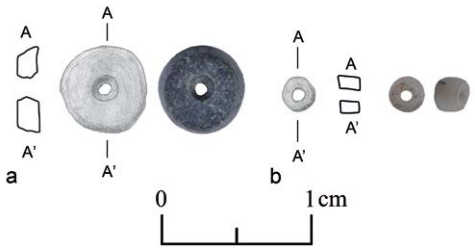

Fig. 31: Flat cylindrical beads, type e (a. TWS18A-01030 and b. TWS18A-04942).

Two flat cylindrical beads with a flat rectangular longitudinal section and a round cross section made of black and white stone have been found during the survey (Fig. 31). Both do not have a perfect disc shape and their ends are not completely parallel to each other. They measure between 1.6 and 2.2 mm in length and between 2.7 and 5.5. mm in diameter. The perforation of TWS18A-01030 is slightly off-centre and was manufactured from both sites. It tapers towards the centre from 1.4 mm at the side to 1.1 mm at the middle. TWS18A-04942 has a perforation in its centre, measuring 0.9 mm in diameter. Both beads weigh less than 0.1 g each. Due to their simple shape and very common material, similarities to this type are of little chronological relevance.

4.1.2 Flat cylindrical beads: Type f

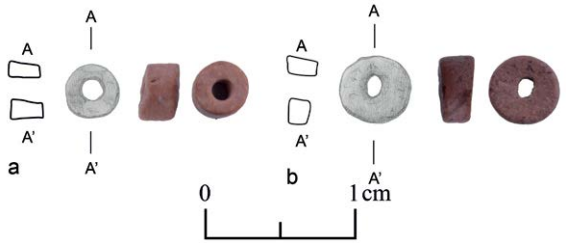

Fig. 32: Flat cylindrical beads, type f (a. TWS18A-01411 and b. TWS18A-06362).

Two other flat cylindrical beads, TWS18A-01411 and TWS18A-06362, are characterised by their material, burnt clay (Fig. 32). They are of reddish-brown colour and measure between 2.0 and 2.6 mm in length and have a diameter of 4.3 to 5.0 mm. Their central perforation has a diameter between 1.4 and 1.7 mm. Both beads weigh less than 0.1 mm. While the ends of TWS18A-01411 are straight and parallel, those of TWS18A-06362 are concave. This type of bead can be found abundantly in Umm an-Nar period contexts such as the burial pits of Bat.[186]

4.1.3 Flat cylindrical beads: Type m

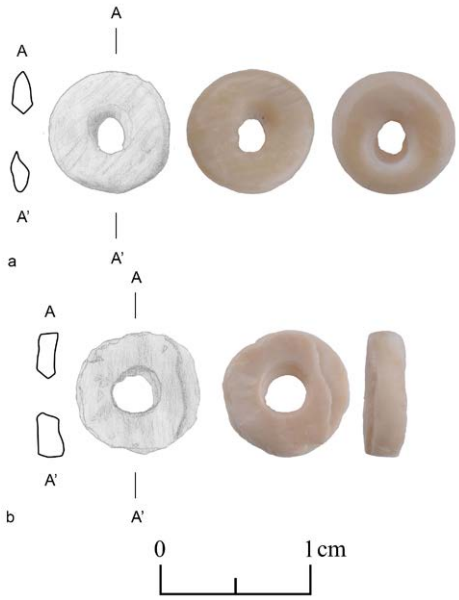

Fig. 33: Flat cylindrical beads, Type m (a. TWS18A-06297 and b. TWS18A-06723).

TWS18A-06297 and TWS18A-06723 are two flat cylindrical beads with a flat rectangular longitudinal section and a round cross section made of highly polished, light brown seashell (Fig. 33). On one side each, the ripples of the shell are still visible, but have been flattened to an even surface to the touch. The oval perforation was made from both sides. TWS18A-06723 is overall slightly arched according to the natural shape of the shell it was made from. The beads measure between 1.6 and 2.4 mm in length and have a diameter of 8.4 to 8.9 mm. They weigh less than 0.1 g each. Similarities to this type of bead can be found for example in the Wadi Suq period tomb Sh6 at Shimal,[187] at Saruq al-Hadid[188] and Sumhuram in southern Oman dating from 300 BCE to 500 CE,[189] at Al-Khashbah in central Oman[190] as well as on Masirah Island.[191] In Saruq al-Hadid as well as in Sumhuram the material of this type of bead is classified as ostrich eggshell.

186 Schmidt 2020: 75–76, Abb. 71.
187 De Cardi 1988: 71 fig. 14.19.
188 Weeks *et al.* 2017: 52 fig. 23 SF27084.
189 Lischi 2018: 68 fig. 2.13.
190 Döpper 2021b: 304 Abb. 291.
191 Charpentier *et al.* 2013: 90 fig. 4.4.

4.1.4 Flat conical beads: Type a

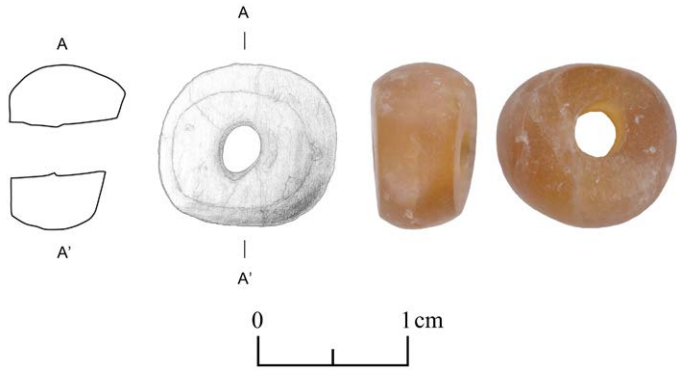

Fig. 34: Flat conical beads, type a (TWS18A-05098).

The flat conical bead TWS18A-05098 is characterised by a flat conical longitudinal section and oval cross section (Fig. 34). It is made of yellowish brown, translucent stone and has a slightly off-centre perforation. It has a length of 6.5 mm and a diameter between 10.4 and 11.4 mm. The bead weighs 1.7 g.

4.1.5 Conical beads: Type c

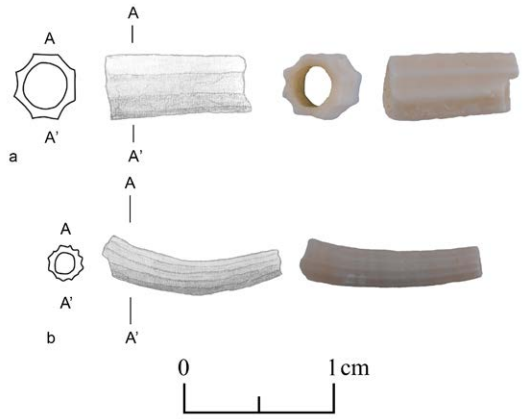

Fig. 35: Conical beads, type c (a. TWS18A-05986 and b. TWS18A-06437).

TWS18A-05986 and TWS18A-06437 are two pieces of *Dentalium octangulatum* shell (Fig. 35). The larger one, TWS18A-06437, measures 18.2 mm in length and could be complete; the smaller one, TWS18A-05986, is only a fragment 8.7 mm in length. The former has a diameter of 4.4 mm at its larger end and 4.1 mm at its smaller one. It weighs less than 0.1 g. The manufacture of this type of bead requires little investment as they can be used as they are or simply cut to the desired length. *Dentalium octangulatum* shells used as beads are known from several sites including fifth millennium BCE Umm al-Qwain,[192] fourth millennium BCE Al-Haddah BDJ-1,[193] late Neolithic Wadi Wuttayah,[194] as well as various Hafit period tombs including those from Jebel Hafit[195] and Tawi Silaim.[196] Further parallels to this type of bead are known from Umm an-Nar period contexts including Tomb III in Al-Sufouh[197] and burial pit A-Inst. 0006 in Bat[198], the Wadi Suq period tomb Sh102[199] and the settlement SX/SY[200] in Shimal, the Wadi Suq to Iron Age tomb Gh2 at Ghalilah,[201] the long-used tombs 76/1 at Dibba[202] as well as PIR period tombs from Ed-Dur.[203] Thus, the chronological range is very long.

4.1.6 Flat biconical beads: Type d

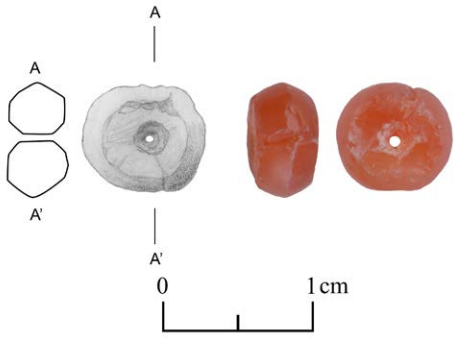

Fig. 36: Flat biconical beads, type d (TWS18A-01967).

TWS18A-01967 has a flat biconical longitudinal section and an oval cross section (Fig. 36). The bead is made of carnelian and measures 4.6 mm in length and between 6.2 and 8.0 mm in diameter. It weighs 0.3 g. The perforation was created by pecking from both sides

192 Uerpmann 2003: 76 fig. 3.

193 Charpentier – Cremaschi – Demnard 1997: 106 fig. 5.17.
194 Uerpmann 1992: 98 fig. 32d.
195 Cleuziou 1977: fig. 17.4; Cleuziou – Tosi 2007: 112 fig. 100.5.
196 De Cardi – Bell – Starling 1979: fig. 8e.
197 Benton 1996: 132 fig. 153.2.
198 Schmidt 2020: 174–175, Abb. 191.
199 Vogt – Franke-Vogt 1987: fig. 16.22
200 Vogt – Franke-Vogt 1987: fig. 48.6.
201 Donaldson 1984: 309 fig. 29.73.
202 Pellegrino *et al.* 2019: 61.
203 De Waele 2007: 399 fig. 2.68–72.

as is common for this type of bead in Eastern Arabia.[204] One side displays several small chips around the edges. Despite some isolated finds of carnelian beads in Eastern Arabia from the Neolithic onwards, they appear in the region to an increased degree only from the later part of the Umm an-Nar period, likely influenced by trade with the Indus Valley.[205] Flat biconical carnelian beads are known amongst others from the Hafit period tomb 1320 at Bat,[206] but are much more common in Umm an-Nar period contexts such as in Ras al-Hadd,[207] Ras al-Jinz,[208] Al-Sufouh,[209] Bat,[210] Umm an-Nar Island[211] and Hili.[212] Moreover this type of carnelian bead was found in the Wadi Suq period tomb 1030 in Adam,[213] at Bidbid[214] and PIR period tombs in Ed-Dur.[215]

4.1.7 Flat biconical beads: Type h

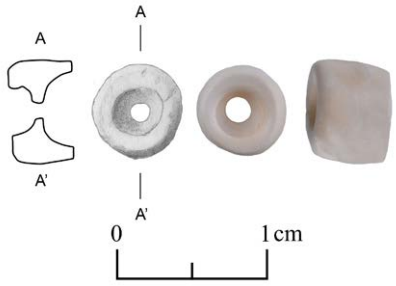

Fig. 37: Flat biconical beads, type h (TWS18A-06264).

TWS18A-06264 has a rectangular longitudinal section and a round cross section (Fig. 37). It measures 5.0 mm in length and 6.6 mm in diameter and is made of white stone. Its perforation was created from both sites and steps inwards towards the centre. The bead weighs 0.3 g.

4.1.8 Long biconical beads: Type c

Long biconical beads of type c have a long biconical to long oval longitudinal section and a round cross section. The three beads of this type found at Tawi Said are made of different coloured stones, among them agate (Fig. 38). Their length ranges between 6.0 and 9.7 mm and their diameter in the middle ranges between 5.3 and 8.3 mm.

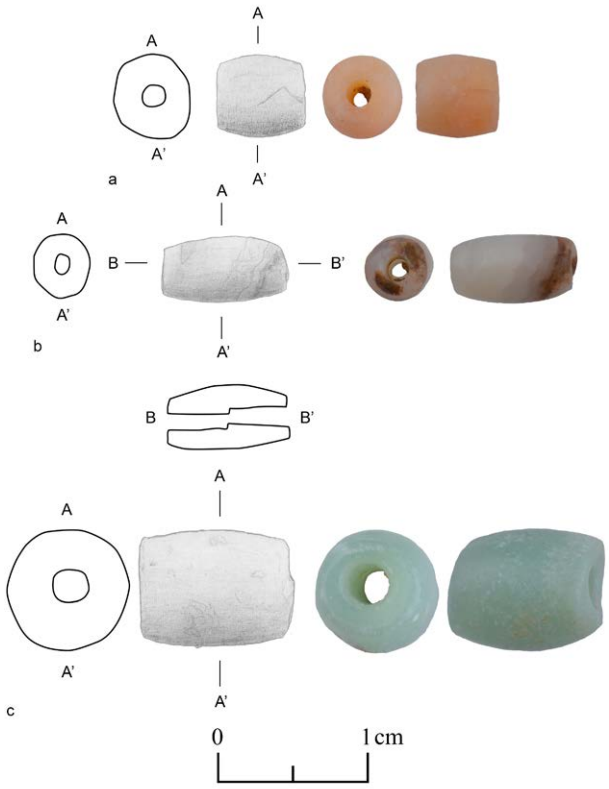

Fig. 38: Long biconical beads, type c (a. TWS18A-02131, b. TWS18A-05122 and c. TWS18A-06066).

At the ends they reach a diameter of 4.4 to 6.8 mm. The weight of the beads lies between less than 0.1 and 1.2 g. The longest bead, TWS18A-05122 has been perforated from both sides, and the perforations do not meet exactly in its middle. Agate long biconical beads have been found in different chronological contexts, amongst others in the Umm an-Nar period burial pit A-Inst. 0006 in Bat,[216] the Umm an-Nar period Tomb II in Al-Sufouh[217] as well as in PIR tombs in in Ed-Dur.[218]

4.1.9 Flat oval beads: Type b

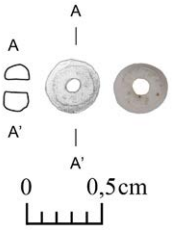

Fig. 39: Flat oval beads, type b (TWS18A-05520).

TWS18A-05520 is a flat oval bead with a round cross section made of white stone. It measures 2.1 mm in length, and between 3.3 and 3.6 mm in diameter. The centrally placed perforation has a diameter of 1.2 mm. The bead weighs less than 0.1 g.

204 Cattani *et al.* 2019: 75.
205 Kenoyer – Frenez 2018.
206 Frifelt 1975: fig. 6B.
207 Cattani *et al.* 2019: 76 fig. 7.
208 Cleuziou – Tosi 2007: 126 fig. 127.9, 13.
209 Benton 1996: 124–125, fig. 144.9–10.
210 Schmidt 2020: 99–100, Abb. 99, 179–180, Abb. 195.
211 Frifelt 1991: 112 fig. 236a.
212 Cleuziou – Méry – Vogt 2011: fig. 61.1, 3, 211 fig. 253.DLA/m165, DLA/m248d.
213 Gernez – Giraud 2017: 69 fig. 6.25.
214 Kenoyer – Frenez 2018: 402 fig. 36.5.
215 De Waele 2007: 398 fig. 1.24.
216 Schmidt 2020: 182 Abb. 200.
217 Benton 1996: 132 fig. 154.
218 De Waele 2007: 298 fig. 1.20.

4.1.10 Flat half-oval bead: Type a

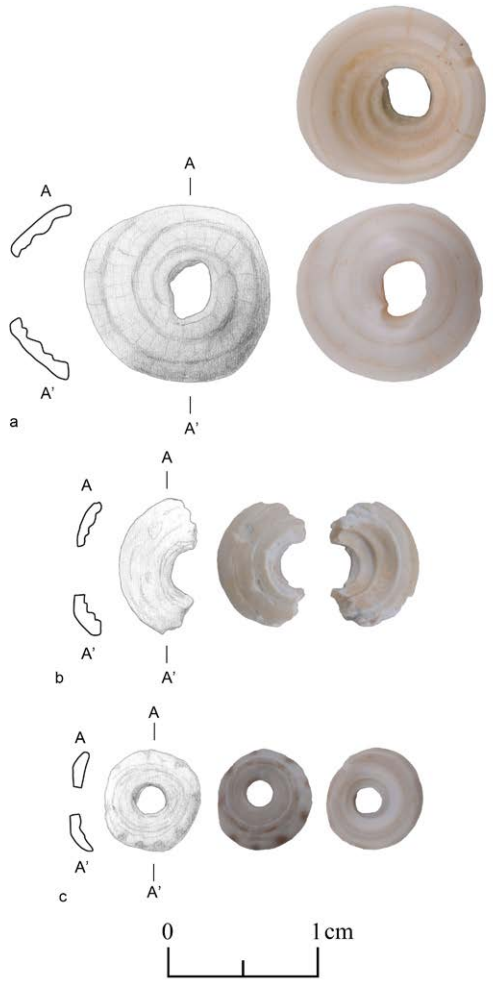

Fig. 40: The flat half oval beads, type a (a. TWS18A-00084, b. TWS18A-00867 and c. TWS18A-03102).

All three beads of this type are made of the upper part of seashells of the *Conus* family (Fig. 40). On their upper surface, they were pierced and polished. The beads have a length between 1.7 and 4.1 mm and a diameter between 7.0 and 11.6 mm. They are quite light and weigh between less than 0.1 and 0.4 g. Beads of this type are known in Eastern Arabia from the Neolithic onwards[219] and also appear at Islamic sites along the Arab–Persian Gulf.[220]

4.1.11 Special form: Type a

Two seashells of the *Conus* family have been found that are perforated through their upper end (Fig. 41). The larger one, TWS18A-01556, measures 21.4 mm in length

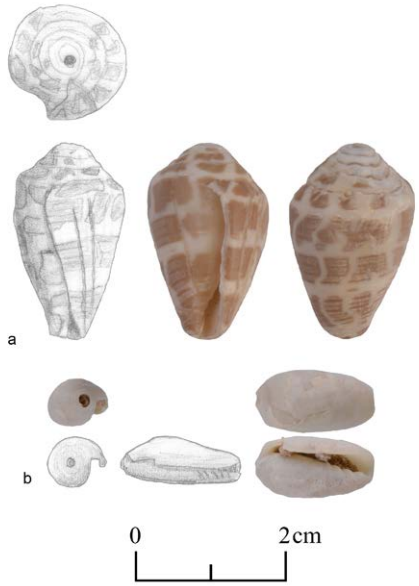

Fig. 41: Special forms, type a (a. TWS18A-01556 and b. TWS18A-07248).

and weighs 4.9 g. The other one, TWS18A-07248, is considerably smaller, having a length of only 8.1 mm and weighing less than 0.1 g. Similar examples of seashells perforated at their upper end are rather common in all periods from the Neolithic onwards in Eastern Arabia.[221]

4.1.12 Special form: Type b

Two semi-finished stone beads were found at Tawi Said (Fig. 42). The first, TWS18A-01056, is white calcite measuring 17.6 mm in length and 9.8 mm in width and shows the beginning of a perforation at its short end. The object itself was carefully sharpened into a cuboid shape. It weighs 4.2 g. The second one, TWS18A-04063, is a semi-finished stage of a cylindrical, dark green stone bead that has approximately two thirds preserved, corresponding to a length of 22.4 mm. An oval perforation was created from one end and a round perforation was created from the other. Both perforations do not meet in the centre of the bead but pass each other. The bead was likely broken during this process and discarded. Both objects clearly demonstrate that bead making was practiced at Tawi Said.

219 Lischi 2018: 71 fig. 5.1–4; Vogt – Franke-Vogt 1987: fig. 48.7–9; Uerpmann 1992: 98 fig. 32n; Jasim – Yousif 2014: 77 fig. 52.7–14; Pellegrino *et al.* 2019: 62 fig. 30.17–18; Charpentier – Cremaschi – Demnard 1997: 106 fig. 5.12–13; Weeks *et al.* 2017; de Cardi 1988: 71 fig. 14.20–21; Vogt 1994: 19 fig. 8.13–14.

220 Francis 1989: 25 fig. 2a.

221 E.g., Lischi 2018: 71 fig. 5.7; Uerpmann 1992: 99 fig. 33d–e; Vogt – Franke-Vogt 1987: fig. 18.23.

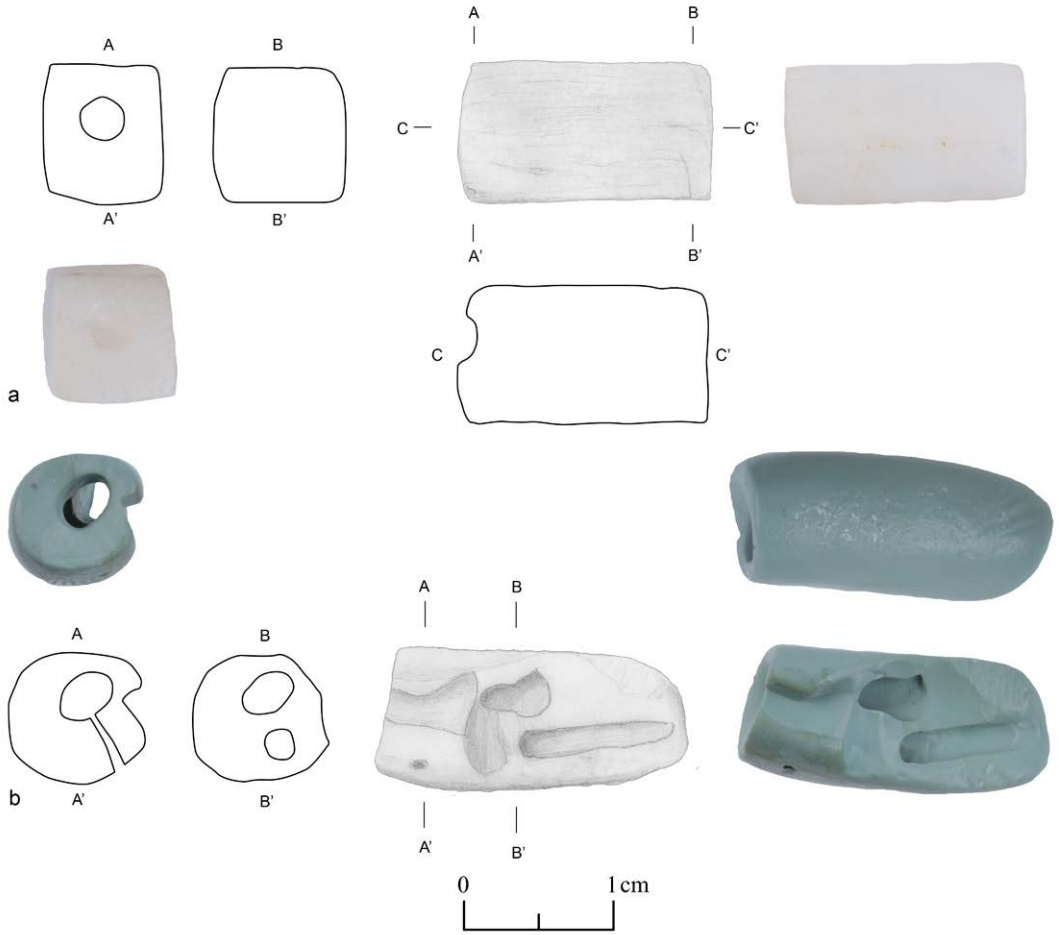

Fig. 42: Special forms, type b (a. TWS18A-01056 and b. TWS18A-04063).

4.1.13 Special form: Type c

Seven beads made of *Engina mendicaria* shells of the *Pisaniidae* family are known from Tawi Said (Fig. 43). They all display the typical white-brown stripes of this species, which is commonly found under rocks on the coast of Oman.[222] Six of them show a characteristic perforation at the side, while one, TWS18A-01628, has no perforation at all, indicating that it was not finished. This one is, however, abraded at its upper end. The perforation is often broken off at its edges and irregular in shape. The shells have a length between 7.3 and 12.6 mm and weigh between less than 0.1 and 0.6 g. Beads of this type have been reported from fifth millennium BCE tombs from Jebel Buhais 18,[223] fourth millennium BCE Al-Haddah BJD-1,[224] late Neolithic Wadi Wuttayah[225] as well as from Hafit tombs from the Jebel Hafit[226] and Bat.[227] They also occur, however, in much younger contexts such as the Tomb Sh100 at Shimal,[228] Wadi Suq to Iron Age tombs Gh2 at Ghalilah,[229] PIR tombs in Ed-Dur[230] and in Sumhuram in southern Oman.[231]

4.1.14 Special form: Type d

TWS18A-04701 is of a similar type to the beads of the special formtype c, with the only difference that it is made not of a seashell from the *Pisaniidae* family, but one from the *Conus* family. In addition to the perforation from the side, which is rather crude, its upper end is abraded so that the natural perforation became visible. The latter makes this bead similar to the special forms type a. The shell measures 16.3 mm in length and weighs less than 0.1 g.

222 Bosch *et al.* 1995: 128.
223 Kiesewetter – Uerpmann – Jasim 2000: 141 fig. 5.
224 Charpentier – Cremaschi – Demnard 1997: 106 fig. 5.19–23.
225 Uerpmann 1992: 98 fig. 32q–v.
226 Cleuziou 1977: fig. 17.3; Cleuziou – Tosi 2007: 112 fig. 100.8.
227 Frifelt 1975: fig. 6G.
228 Vogt – Franke-Vogt 1987: fig. 30.7.
229 Donaldson 1984: 309 fig. 29.74.
230 De Waele 2007: 299 fig. 2.78.
231 Lischi 2018: 71 fig. 5.9.

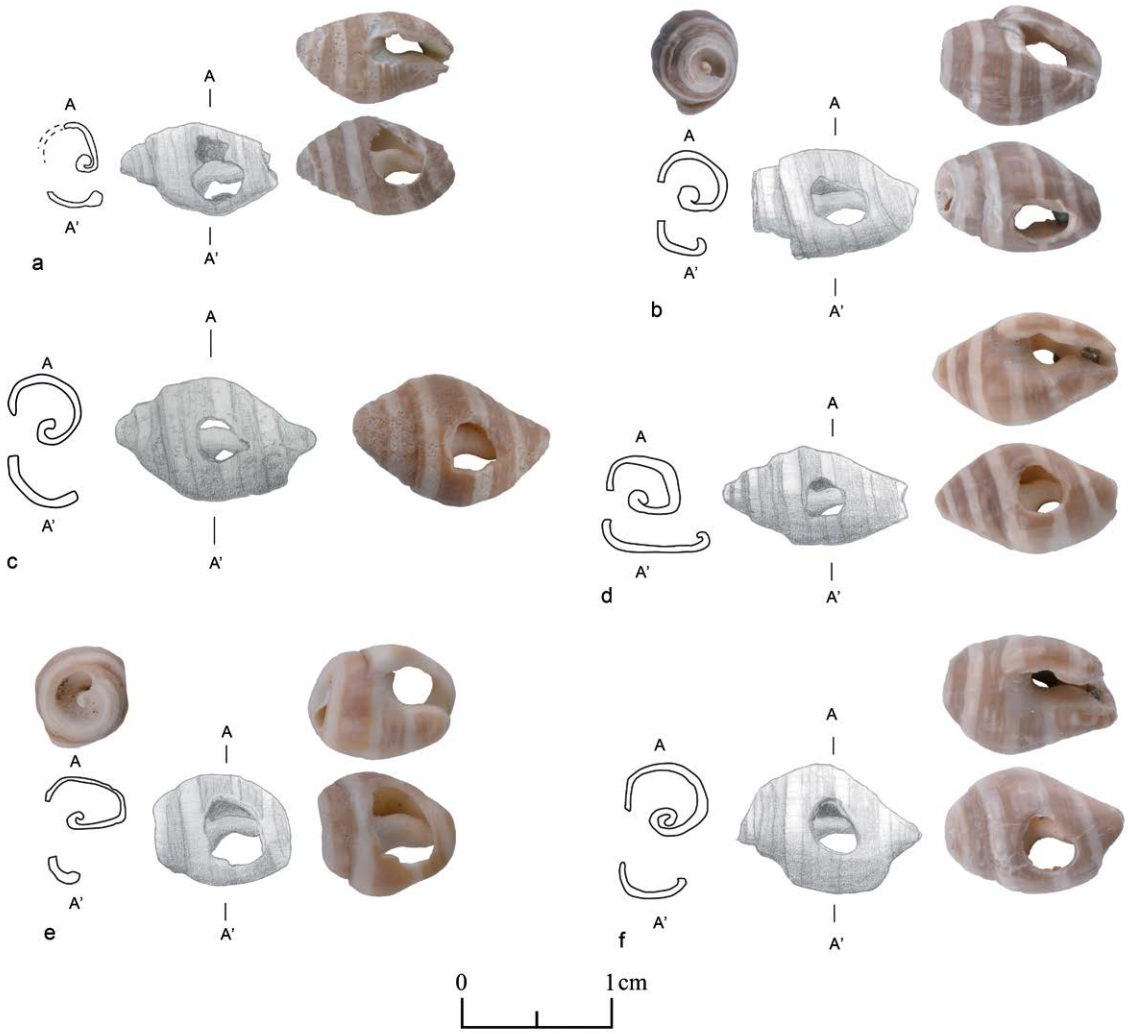

Fig. 43: Special forms, type c (a. TWS18A-00425, b. TWS18A-02110, c. TWS18A-02691, d. TWS18A-05382, e. TWS18A-05771 and f. TWS18A-06739).

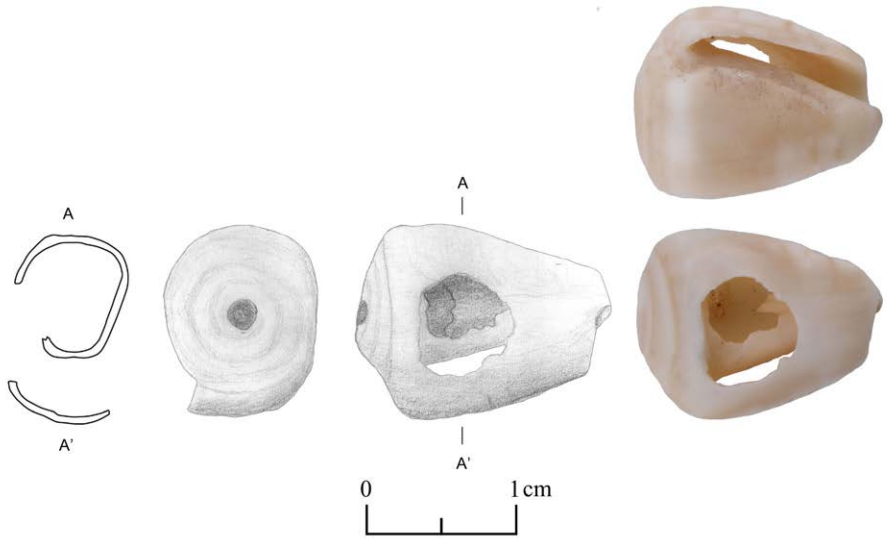

Fig. 44: The special forms, type d (TWS18A-04701).

4.1.15 Unspecified beads

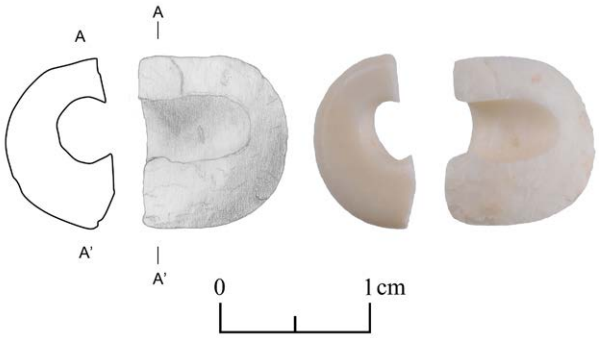

Fig. 45: Unspecified beads (TWS18A-02939).

Too little is preserved of TWS18A-02939 to identify its type. It is either a fragment of a long or flat cylindrical bead with rectangular longitudinal and round cross section. The fragment measures 8.7 mm in length and has a diameter of 12.5 mm at its widest point. It has a weight of 1.0 g.

4.2 Pendants

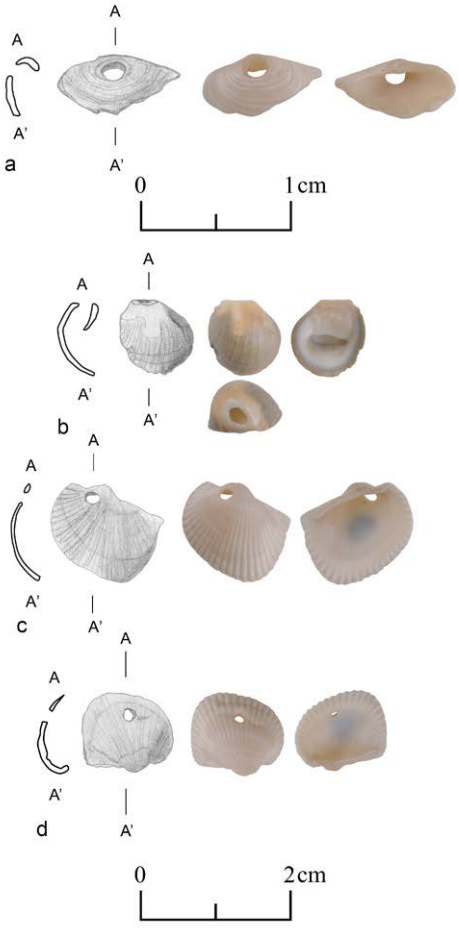

Fig. 46: Bivalve shell pendants (a. TWS18A-06010, b. TWS18A-06637, c. TWS18A-07115 and d. TWS18A-07385).

Out of the nine pendants found in the Tawi Said survey, eight are made of seashell and one of limestone. Four of the seashell pendants are halves of bivalve shells with a hole near the umbo, and in one case at the opposite end (Fig. 46). Two shells, TWS18A-07115 and TWS18A-07385, are of the *Arcidae* family, one, TWS18A-06010, of the *Tellinacae* family and the last, TWS18A-06637, of the *Veneridae* family. No further traces of manufacture besides the perforation are visible on the shells. The diameter of the perforation varies between 1.1 and 1.9 mm. They were all found in the northeastern part of the survey area (Fig. 30). Similar artefacts to this type of shell pendant exist amongst others from Tomb As3 at Asimah.[232]

The two pendants TWS18A-03800 and TWS18A-04053 are made of parts of bivalve shells, in the case of the latter of mother-of-pearl (Fig. 47). TWS18A-04053 measures 38.5 mm in length, 32.2 mm in width and is 1.4. mm thick. It has an irregular triangular shape and a circular perforation with a diameter of 1.8 mm near the tip of the triangle. The object weighs 1.9 g. TWS18A-03800 is half of a roughly circular pendant measuring 15.1 mm in length and 9.7 mm width. It is broken off along a circular perforation, which has a diameter of 1.8 mm. A similar piece to TWS18A-03800 has been found at Saruq al-Hadid and is considered there as an unfinished shell bead blank.[233] This could also be true for the piece from Tawi Said. In this case, it would be the unfinished version of a flat cylindrical bead type m.[234]

TWS18A-01719 is a pendant made of a shell of the *Conus* family that was perforated near its lower end (Fig. 48). The surface of the shell is strongly weathered. The shell has a length of 22.2 mm and weighs 6.0 g. The perforation is oval and broken off at the edges. TWS18A-07360 is another pendant made from a complete shell, in this case from *Cypraidae moneta*.[235] A rough perforation was drilled through the smaller end of the shell chipped on all edges. The shell has a length of 24.5 mm and a weight of less than 0.1 g. Similar pendants were found at Shimal Tomb Sh1.[236]

TWS18A-03368 is the only stone pendant found at Tawi Said (Fig. 49). It is made of a stone that is white and smooth on one side and green and rough on the other. It is a rough drop shape and measures 25.4 mm in length, 20.0 mm in width and 6.6 mm in thickness. The circular perforation was executed from both sides and tapers towards the centre. The object weighs 3.4 g. Likely similar, but badly preserved pendants of a soft, chalky stone were found in the Umm an-Nar tomb 155

232 Vogt 1994: 19 fig. 8.9.
233 Weeks *et al.* 2017: 53, 55 fig. 23 SF28258.
234 For seashell manufacture at Tawi Said see chapter 8.
235 Bosch *et al.* 1995: 78.
236 Donaldson 1984: 293 fig. 13.23, 25.

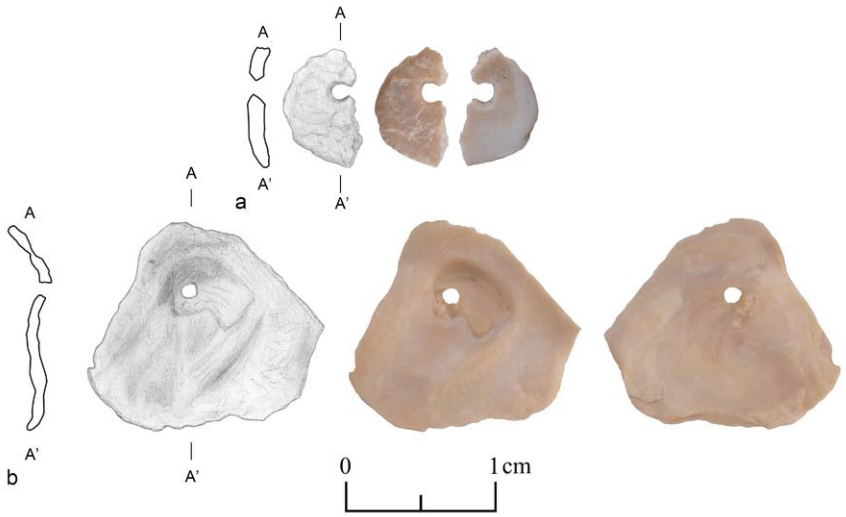

Fig. 47: Bivalve shell pendants (a. TWS18A-3800 and b. TWS18A-04053).

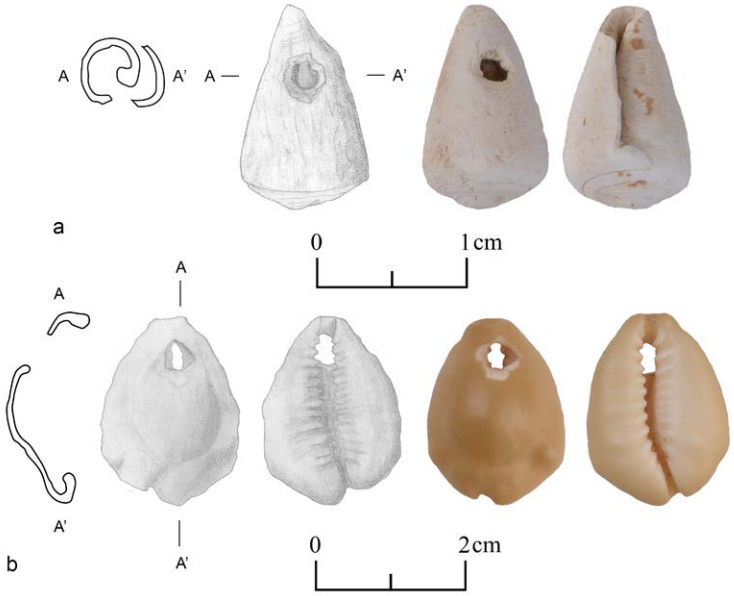

Fig. 48: Gastropod shell pendants (a. TWS18A-01719 and b. TWS18A-07360).

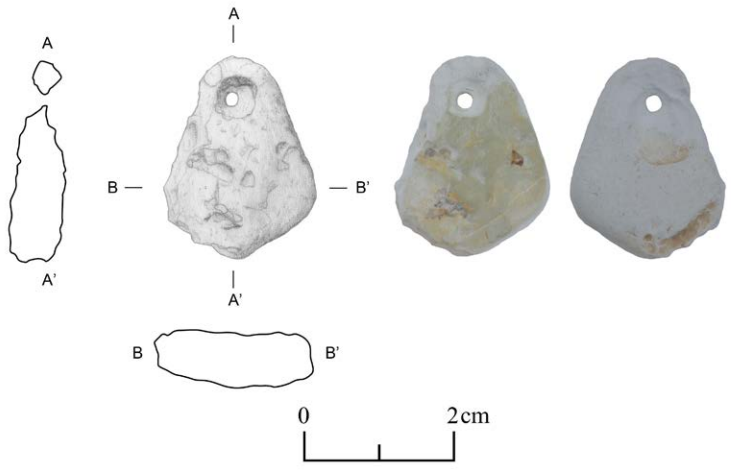

Fig. 49: Stone pendant (TWS18A-03368).

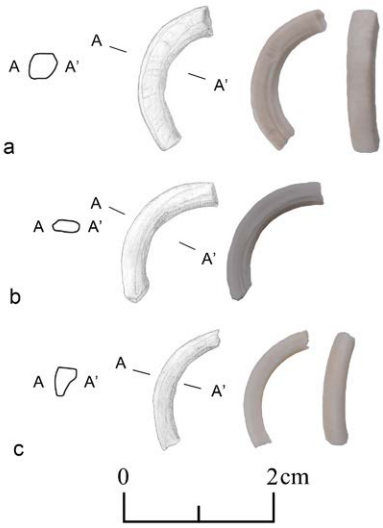

Fig. 50: Shell rings (a. TWS18A-01872, b. TWS18A-03180 and c. TWS18A-04536).

at Bat.[237] As this tomb witnessed several episodes of reuse, the chronological attribution of these objects remains, however, uncertain. Other limestone pendants come from Tomb As3 at Asimah, where the chronological range of the tomb's use is also unclear.[238]

4.3 Shell rings

Three very similar fragments of shell rings were discovered at Tawi Said (Fig. 50). Each has roughly one third of the circle preserved. In section, they are between 3.5 and 3.1 mm in length and between 1.3 and 2.8 mm in width. The fragments weigh between 0.3 and 0.6 g. Most likely they were fabricated from the upper ends of shells from the *Conidae* or *Strombidae* families. Shell ring manufacture has been evidenced in Eastern Arabia since the fourth millennium BCE,[239] for example at the coastal sites of Ras al-Jinz[240] and Ras al-Hadd.[241] In the Bronze Age, they belong to the few testified imports from the coast to the inland[242] and also served as export goods to other regions.[243] Shell rings are a common feature of burials in Eastern Arabia, e.g., at Dibba Tomb 76/1[244] and Shimal tombs Sh1[245] and Sh6[246], but were also found at the metallurgical site of Saruq al-Hadid.[247]

4.4 Glass bangles

Seven glass bangle fragments were found during the Tawi Said survey (Fig. 51). All are made of black glass and two of them have additional streak of coloured glass added. TWS18A-04620 features two strings, one of red and one of yellow glass, whereby the yellow one is broader than the red one. The width of the bangle's section is 6.4 mm, its thickness 5 mm. A yellow red banded glass string adorns TWS18A-06251. It is placed in a small circumferential groove on the outer side of the bangle. It has a width of 6.9 mm in section and a thickness of 5.9 mm. Three of the simple black coloured bangle fragments have a circumferential groove on the outer side, i.e., TWS18A-04925, TWS18A-04928 and TWS18A-04991. They are likely fragments of one and the same bangle. The two other plain bangles, TWS18A-05506 and TWS18A-06251, have a roughly triangular cross section. Most fragments have a whitish corroded surface. It is generally assumed that glass bangles appear in the 14th/15th century CE in Eastern Arabia and were most popular between the 15th and 17th centuries.[248] They are, however, also known from 20th century contexts.[249] The majority of glass bangles found in Eastern Arabia seem to have been produced in Iran and India.[250] A similar artefact to TWS18A-06251 with its added banded coloured glass string comes from 17th/18th century Yemen,[251] and a similar artefact to TWS18A-04620 possibly at Qalhat.[252] Parallels to simple black glass bangles come from 18th century layers at Julfar,[253] from the Hadhramaut in Yemen,[254] as well as from a tomb that was target of a rescue excavation in conjunction with the construction of the Batinah Expressway.[255] No date is given for this tomb. In any case, the glass bangles clearly belong to the (Late) Islamic occupation of Tawi Said. All except TWS18A-06251, which comes from the northwestern part of the survey area, were found concentrated in the northeast (Fig. 30).

237 Döpper 2021c: 42.
238 Vogt 1994: 19 fig. 8.15–16.
239 Marcucci 2012.
240 Charpentier 1994.
241 Marcucci 2018.
242 Charpentier 1994: 167.
243 Marcucci 2012: 449.
244 Pellegrino *et al.* 2019: 65.
245 Donaldson 1984: 293 fig. 13.26–27.
246 De Cardi 1988: 71 fig. 14.12–14.
247 Weeks *et al.* 2017: 53 fig. 23 SF20247.
248 Swan 2018: 281.
249 Ziolkowski – Al-Sharqi 2005.
250 Swan 2018: 281.
251 Boulogne – Hardy-Guilbert 2020: 140 fig. 7e.
252 Vosmer 2004: 391 fig. 3.
253 Hansman 1985: 81.
254 Whitcomb 1988: 247 fig. 21a, d.
255 Van De Geer *et al.* 2014: 116 fig. O 15.

Fig. 51: Glass bangles (a. TWS18A-04620, b. TWS18A-04925, c. TWS18A-04928, d. TWS18A-04991, e. TWS18A-05506, f. TWS18A-06021 and g. TWS18A-06251).

5 Stamp seals (Stephanie Döpper)

Two stamp seals come from the Tawi Said survey.[256] They were found in the northwestern part of the survey area, near the concentration of Wadi Suq period material. The first one, TWS18A-02783, has a dome shape and is made of a light green stone that is rather weathered and features some natural cracks (Fig. 52 and Fig. 53). The seal measures 13.4 mm in diameter, has a height of 8 mm and weighs 2.4 g. Most likely its transversal perforation was made from both sides. The motif on the seal consists of a horizontal line in the centre from which three lines diverge to the one side and two lines to the other side at a right angle. Further lines are present at its edge. It possibly depicts a highly stylised quadruped. In terms of its shape, TWS18A-02783 has similarities to other Wadi Suq period seals found for example in Shokur, Bidbid,[257] Tell Abraq,[258] Jebel Buhais[259] as well as Mazyad.[260] Further, it evokes connections with Dilmun seals, although it is missing the disc that is usually surmounted by the dome. The stamp motif, however, neither resembles Dilmun glyptic nor those from the other dome-shaped seals found on the Oman Peninsula, which feature zigzag lines and representations of human figures. If the decoration on the seal's surface really depicts an animal, which is far from certain, a possible parallel originates from the Hili N pit-grave, dating to the very end of the Early Bronze Age.[261] Layer 9 of the grave contained a necklace with a perforated circular chalcedony seal with an engraved quadruped with horns, likely a bull. Generally, a date for the stamp seal TWS18A-02783 in the Wadi Suq period can be assumed.

The second seal from Tawi Said, TWS18A-03571, is made of dark grey soft-stone and weighs 4.6 g (Fig. 54 and Fig. 55). The oval sealing surface measures 19.5 mm in length and 17.3 mm in width. It is 5.2 mm thick and has a rectangular section with rounded corners. A pierced boss, which is broken off, is present on the top, resulting

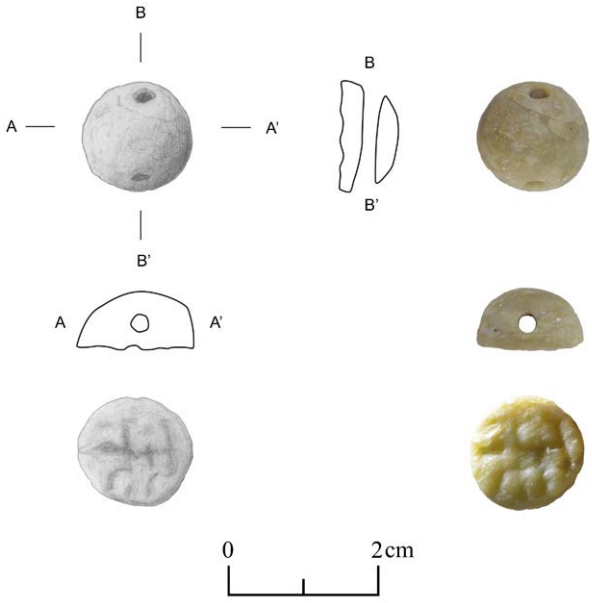

Fig. 52: Stamp seal TWS18A-02783.

Fig. 53: Stamp seal TWS18A-02783 *in situ*.

in a total height of 12.3 mm for the seal. A row of five circular drill holes along the seal's edge is clearly visible on the sealing surface. They surround an oval depression in the centre of the seal, which is associated with two incised lines and another circular drill hole similar to those at the edge of the seal. A stamp seal similar in shape

256 Döpper – Schmidt 2020.
257 David-Cuny – Frenez – Williams 2016.
258 Potts 1993b: 433.
259 Jasim 2008: 54–55.
260 Cleuziou 1981: 285.
261 Méry *et al.* 2001: 168, 171 fig. 112.

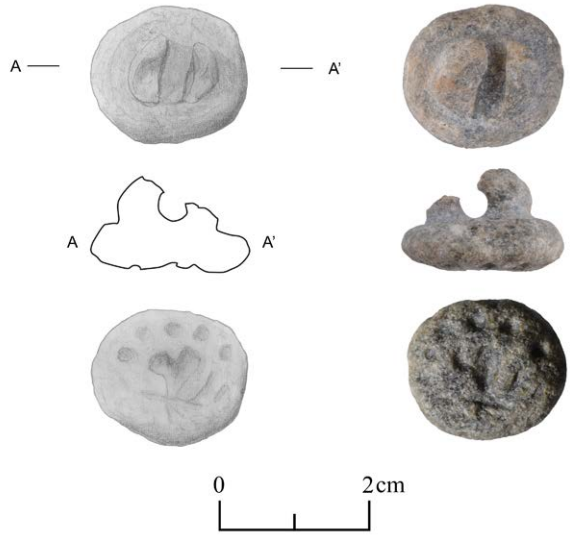

Fig. 54: Stamp seal TWS18A-03571.

Fig. 55: Stamp seal TWS18A-03571 *in situ*.

and to some extent in decoration to TWS18A-03571, but made of lead, has been found on the surface of the so-called 'Iron Age settlement' of Qarn bint Saud (Fig. 56d).[262] It shows a simple geometric design with sixteen dots on the edge surrounding parallel lines that form a crosswise pattern with two concentric circles in the centre. An almost identical example, also made of lead, comes from Jebel al-Buhais (Fig. 56c).[263] A better parallel also in terms of material, is a surface find from Salut (Fig. 56b).[264] This circular seal is made of grey-greenish chlorite and has a pierced boss on its back. The sealing surface and the backside are flattened, and the overall section is rectangular with rounded short sides. On the sealing surface, it shows ten shallow circular drill holes roughly arranged in two concentric rows. Besides this, four irregular straight incisions define a sort of cross. As it is a surface find, no precise date can be given, but the dense scatter of Iron Age sherds at its findspot suggests its attribution to this period. The decoration on the sealing surface of TWS18A-03571 finds further parallels in a conoid seal from Iron Age levels at Tell Abraq (Fig. 56f).[265] Here, the combination of rough straight lines and circular drill holes has been interpreted as a stylised bunch of dates. The closest parallel to the Tawi Said seal comes from an Iron Age context in Rumailah (Fig. 56e).[266] The circular sealing surface has a row of ten dots along the edge and a star-shaped pattern in its centre. A very flat pierced boss is on its back. The rather rough

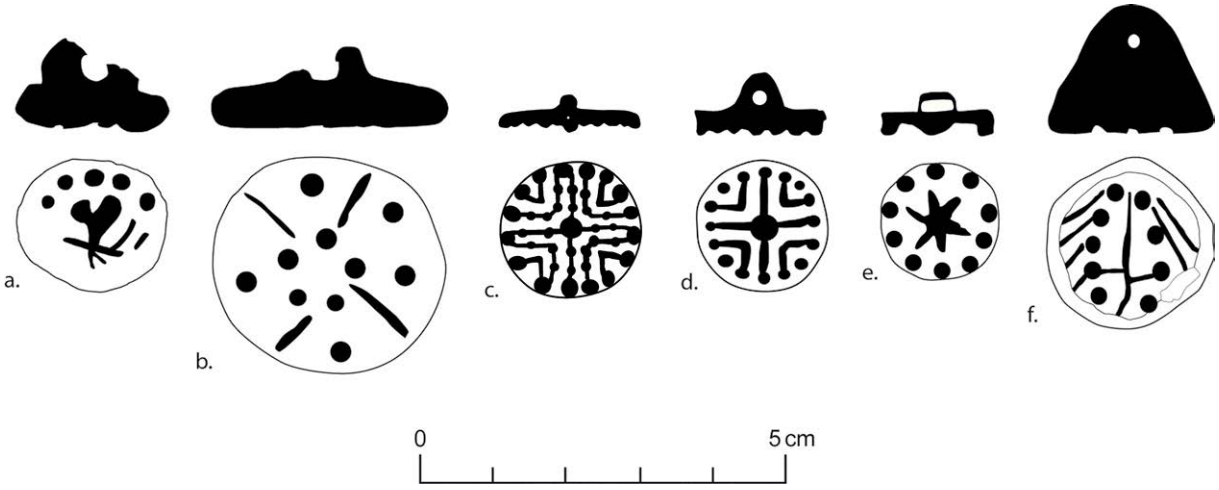

Fig. 56: Similar artefacts to TWS18A-03571: a. Tawi Said, b. Salut (based on Degli Esposti – Al-Muzini 2015: 91 fig. 92), c. Jebel Buhais (based on Jasim 2008: 60 fig. 11a), d. Qarn bint Saud (based on Stevens 1992: 174 fig. 171), e. Rumailah (based on Boucharlat – Lombard 1983: 15 fig. 11) and f. Tell Abraq (based on Potts 1991a: 95 fig. 135).

262 Stevens 1992.
263 Jasim 2008: 61.
264 Degli Esposti – Al-Muzini 2015.
265 Potts 1991a: 95.
266 Boucharlat – Lombard 1983: 6 fig. 11; Lombard 1998: 156 fig. 151.

style of the carvings and the use of shallow drill holes for the schematic motifs of all these seals is typical for Iron Age seals from the Oman Peninsula.[267] Therefore, the parallels listed above argue for a date of the stamp seal TWS18A-03571 from Tawi Said to the Iron Age. The numbers of Wadi Suq period pottery sherds from its find context and the fact that, although soft-stone is the most common material for Iron Age seals from the Oman Peninsula[268], seals of similar shape manufactured from this material have been known since the Early Bronze Age[269] and this leads to the conclusion that this second seal could also be of a Wadi Suq period date.

As seals are relatively scarce in all periods on the Oman Peninsula, and thus accordingly also in the Wadi Suq period, the presence of two of them at the site of Tawi Said is noteworthy, although it remains unclear whether the seals were actually used in their intended function as administrative objects or that they rather represent prestige goods without further practical application. Both seals are clearly of local manufacture, which fits very well to the idea of a local second millennium stamp seal tradition on the Oman Peninsula.[270] The shape of TWS18A-02783 refers, however, to Dilmun seals and is therefore a good indicator for the interregional contacts of the site, despite it being located far inland.

267 Degli Esposti – Al-Muzini 2015: 136.
268 Yule 2014: 42.
269 Cleuziou – Tosi 2000: 58 Fig. 16.52, 54–55, 59–63.
270 Potts 1993b: 433.

6 Stone vessels (Jonas Kluge)

During the 2018 survey, three soft-stone vessel fragments and one fragment made of another stone have been found (Fig. 57). These include a small, decorated rim sherd, a fragment of a rim and an undecorated body sherd. All these pieces originate from the northwestern part of the survey area, from the zone between the two runways. The number of fragments is too low to recognise a concentration.

6.1 TWS18A-03105

TWS18A-03105 is a small lid fragment that has been previously published as a rim sherd of an open bowl (Fig. 58).[271] A re-evaluation of the piece – especially of the deep groove – indicates otherwise. The piece measures 19 mm in length, 15 mm in width and features a thickness of 8 mm. On the outside a single double dot-in-circle motif is visible. Double dot-in-circle motifs are attested both during the Umm an-Nar and the Wadi Suq

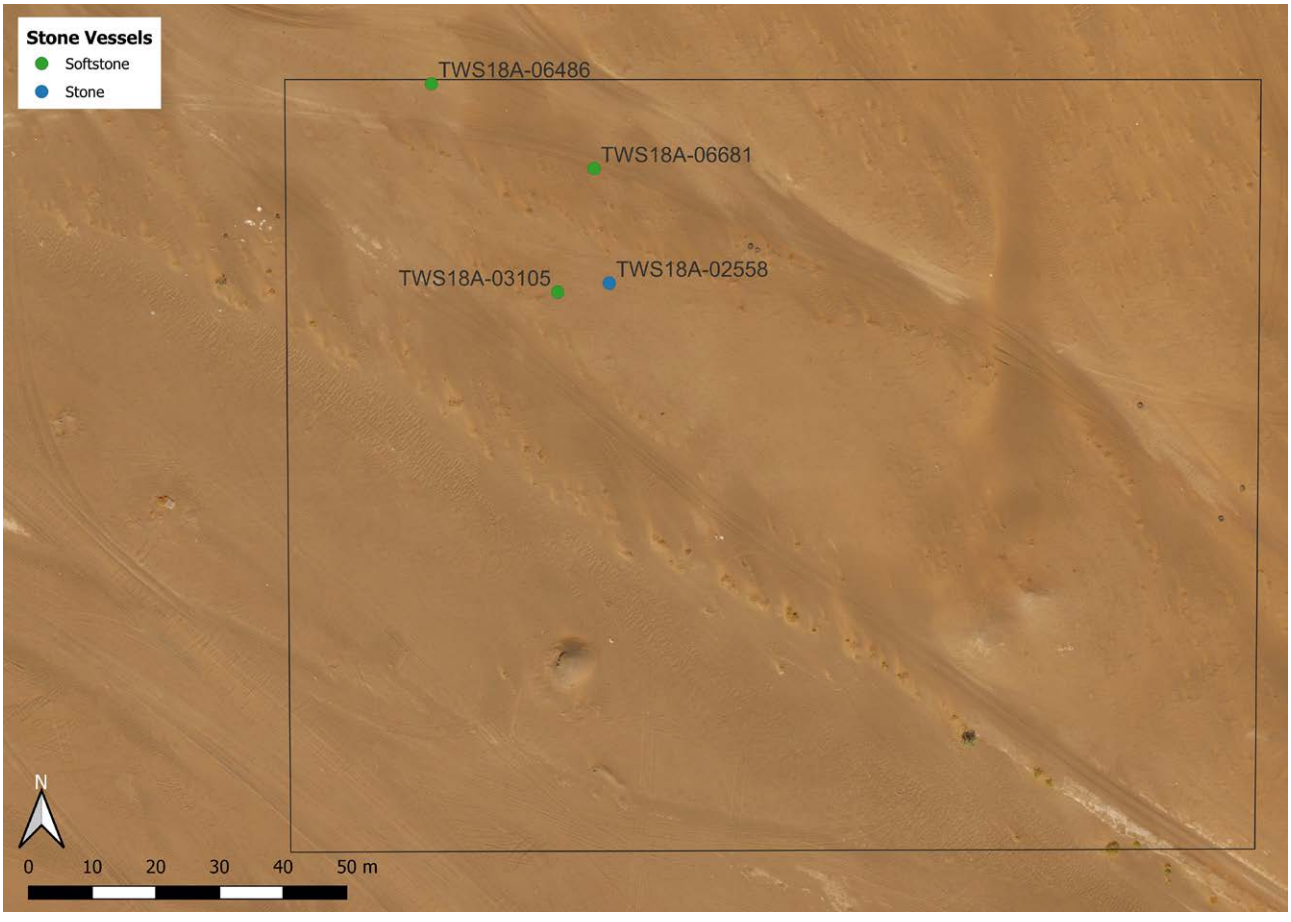

Fig. 57: Distribution of stone vessel fragments.

271 Döpper 2020b: 17.

period. The preserved part of the decoration is too small to give a more precise date. Double dot-in-circle motifs on rims are attested during both periods,[272] although the lids of the Umm an-Nar period are characterised by a very concave lower side while lids of the Wadi Suq period exhibit a flat lower side.[273] This seems not to be the case during later periods. This might suggest that the fragment from Tawi Said can be dated tentatively to the Umm an-Nar period.

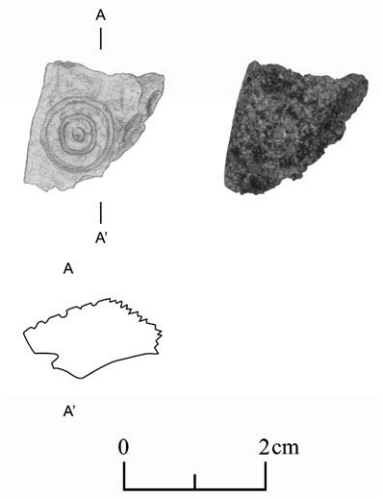

Fig. 58: The lid fragment TWS18A-03105.

6.2 TWS18A-06486

TWS18A-06486 is a fragment of a lid of unknown form and dimensions (Fig. 59). Only the middle part with the knob has been preserved measuring 46 mm in length, 41 mm in width and 14 mm in thickness. The round, flat knob has a diameter of 23 mm and is completely undecorated and relatively crudely worked. The lower surface is concavely bent. The date of the piece is rather difficult as no parallels from literature are known. Knobs this size and form without any decorations have no similarities to other soft-stone vessels from the Bronze or Iron Age. An alternative interpretation of the fragment as an unpierced lug or knob positioned at the side of the vessel might be possible, although those normally tend to be rather of a rectangular shape. A production date during Islamic times might also be conceivable. However, similar artefacts from this period are broadly lacking. Alternatively, a reworking of the piece, during which process the top part of the lid was chipped off, might be assumed. This could also explain the rough working of the knob surface compared to the rest of the surface.

6.3 TWS18A-06681

This piece, measuring 31 mm in length, 30 mm in width and 5 mm in thickness, is a small body sherd made of a very fine, dark greyish-greenish material (Fig. 60). No traces of decoration are visible on the piece. For this reason, a date for the piece is currently not possible.

6.4 TWS18A-02558

TWS18A-02558 is a rather unusual piece in the assemblage of Tawi Said (Fig. 61). It is a rim fragment of an undeterminable, possibly open vessel, measuring 21 mm in length, 16 mm in width and 3 mm in thickness. The material is not of a greyish soft-stone such as steatite or chlorite but of a harder, reddish-beige stone, which is interspersed with little black dots. The precise material the vessel was made of could not be determined. No parallels from other sites in Oman or the UAE are known.

6.5 Conclusion

The amount of soft-stone vessel fragments found at Tawi Said is quite low. None of the pieces can be dated to the Wadi Suq period. The only dateable fragment, TWS18A-03105, originates quite possibly from the previous Umm an-Nar period. Usually, soft-stone vessels of these periods are associated with burials and grave goods and not with domestic contexts. A major issue is, however, the limited amount of information about domestic settlements of the Wadi Suq period, especially in the interior of Oman. Therefore, the existence of soft-stone vessels at domestic sites can currently not be excluded. The archaeological record at Tawi Said does not signify the existence of a Wadi Suq burial in this area. If a destroyed tomb was in the vicinity, one should expect more pieces of the same vessel or larger fragments. The low number of soft-stone fragments is emphasized by comparing it to the large amount of pottery. Additionally, no indications for human remains were found.

There are no semi-finished pieces or raw materials that might indicated that soft-stone vessels were produced at Tawi Said. Known sources of chlorite or steatite are quite far away from the site, although smaller outcrops might exist in the vicinity.[274] The lid fragment TWS18A-06486 might be seen as evidence for a small-scale re-working of older pieces at the site. This might also explain the presence of an Early Bronze Age lid fragment without any further signs of an Umm an-Nar tomb or occupation.

272 David 1996: 36 fig. 5.9; David 1996: 40 fig. 6.13.
273 David 1996: 35.
274 David 2001: 319.

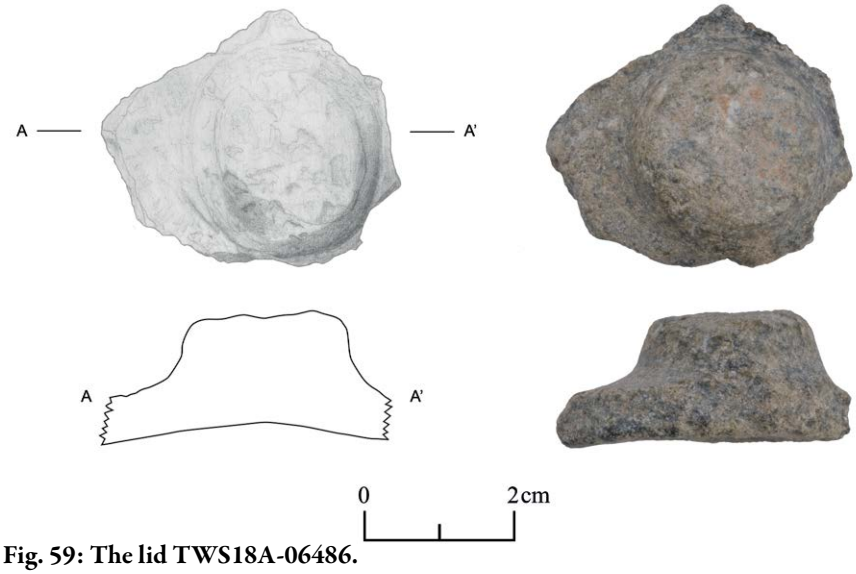

Fig. 59: The lid TWS18A-06486.

Fig. 60: Body sherd TWS18A-06681.

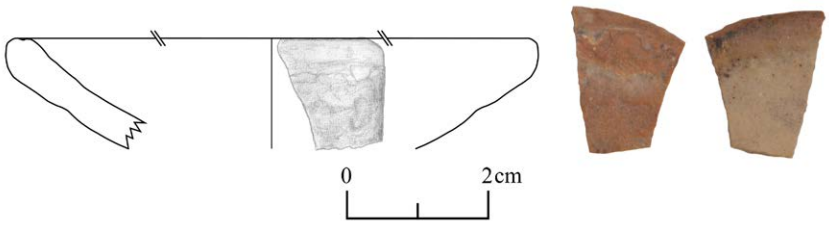

Fig. 61: Rim sherd TWS18A-02558.

7 Ground Stone Tools (Stephanie Döpper)

Seven pieces of grinding stones were discovered at Tawi Said. None of them is complete and only three are preserved to such an extent that the curvature of the working surface could be classified. As far as is determinable, three pieces are corners of a rounded or loaf-shaped upper grinding stone, three are pieces from the middle of a rounded or loaf-shaped upper grinding stone and one is approximately one third of a rectangular lower grinding stone. Thus, they all belong to what Davis[275] classified as type 1: 'ovoid stones, which have been worn to a greater extent on one area of a face parallel to the long axis'. The high degree of fragmentation of these ground stone tools can be an indicator that they were used secondary as crushing tools.[276] The identification of the rock type used in their manufacture was conducted through visual examination by Wilfried Bauer from the German University of Technology in Muscat, revealing that four pieces were made of gabbro (i.e., Davis' type 1c) and two of sandstone (i.e., Davis' type 1a). 100 to 160 photographs have been taken of each object from Tawi Said to generate a 3D model by structure from motion.

TWS18A-02769 is a corner fragment of a small, round or loaf-shaped upper grinding stone made of dark brown sandstone (Fig. 62a). The piece measures 81 mm in length, 65 mm in width and 29 mm in height. It weighs 252.5 g. It has a plane working surface that curves upwards towards the preserved end. Here, its working surface is very smooth. Another corner fragment of a rounded or loaf-shaped grinding stone is TWS18A-02973 made of dark grey gabbro (Fig. 62b). It has a length of 82 mm, a width of 68 mm, a height of 31 mm and weighs 193.4 g. The third corner fragment is TWS18A-03874 (Fig. 62c). It is, as the first, made of light brown sandstone and measures 105 mm in length, 50 mm in width and 38 mm in height. Its weight amounts to 241.2 g. Both sandstone and gabbro can be found as pebbles in the nearby wadi and in foothills of the Hajar Mountains about 12 km to the north of Tawi Said.

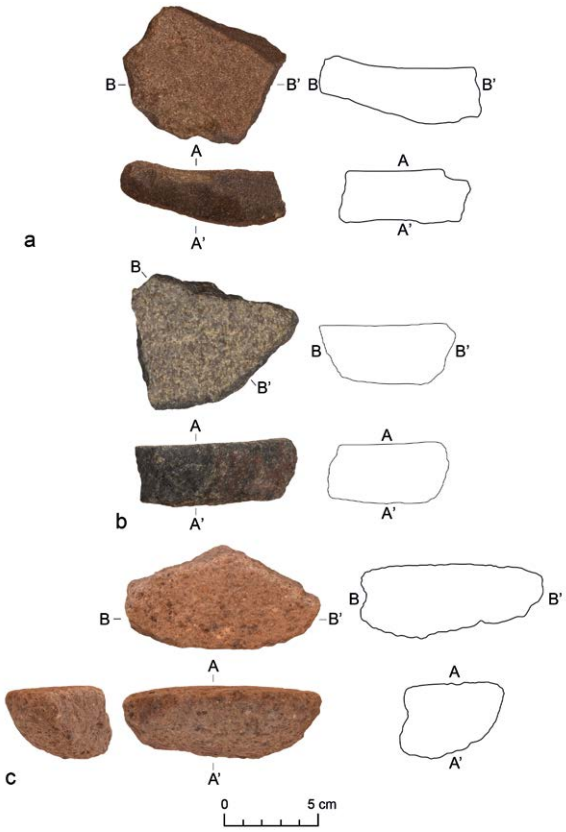

Fig. 62: Corner fragments of loaf-shaped upper grinding stones (a. TWS18A-02769, b. TWS18A-02973 and c. TWS18A-03874).

TWS18A-03366 is a small fragment of a dark grey gabbro grinding stone on whose working surface striations from back and forward motions are visible (Fig. 63a). The working surface is concave in both directions. The fragment measures 83 mm in length, 88 mm in width, 43 mm in height and has a weight of 630.9 g. TWS18A04569, another middle piece of an oval or loaf-shaped upper grinding stone, is characterised by a concave working surface (Fig. 63b). It was worked from dark grey gabbro, measures 58 mm in length, 120 mm in width and 41 mm in height. The fragment weighs 599.8 g. Another middle piece of dark grey stone is TWS18A-04896 (Fig.

275 Davis 1998: 216.
276 Webb 2015: 24.

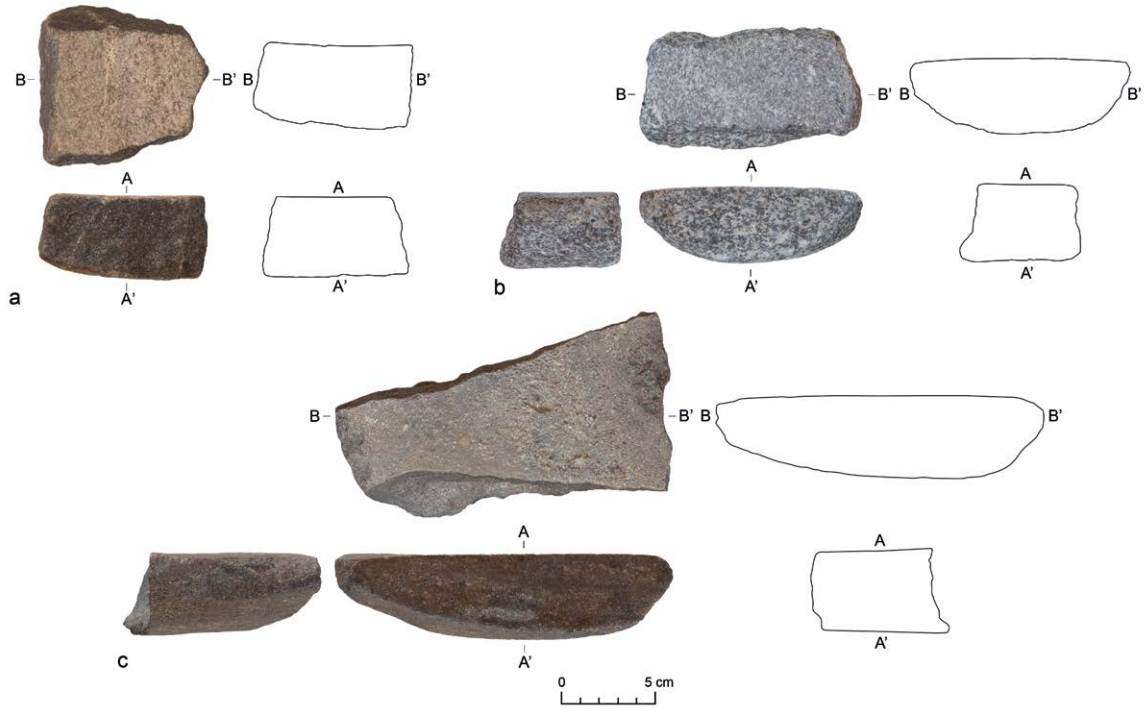

Fig. 63: Fragments of grinding stones (TWS18A-03366, TWS18A-04569 and TWS18A-04896).

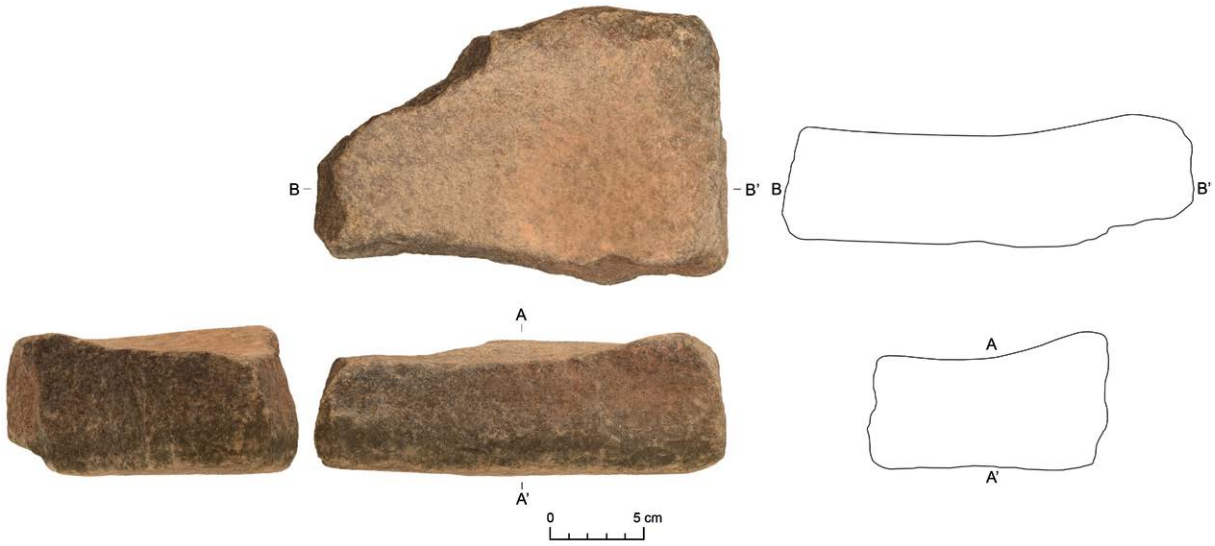

Fig. 64: Fragments of a lower grinding stone (TWS18A-06812).

63c). It has a length of 82 mm, a width of 155 mm and a height of 39 mm. The piece weighs 746.9 g.

TWS18A-06812 is the only fragment of a lower grinding stone found during the survey (Fig. 64). It is preserved to approximately one third of its original size, measuring 199 mm in length, 133 mm in width and 74 mm in height. It has a working surface that is strongly concave both in longitudinal section and cross section. The working surface begins ca. 30 mm away from the preserved edges. The piece of grey gabbro weighs 3820 g.

7.1 Ground stone tools in Eastern Arabia

So far, only a few studies on ground stone tools have been conducted in Eastern Arabia, most of them dealing with Early Bronze Age material, including Umm an-Nar Island,[277] Tell Abraq,[278] Shimal,[279] Muwailah,[280]

277 Frifelt 1995.
278 Potts 1991a: 30–32; Magee *et al.* 2017.
279 Vogt – Franke-Vogt 1987: 81.
280 Davis 1998.

Mleiha,[281] Al-Thuqaibah,[282] Hili,[283] Rumailah,[284] Bat,[285] Maysar,[286] Al-Khashbah[287] and Wadi Shab.[288] Two main functions for these ground stone tool assemblages are discussed: grain processing and metal working, the latter mainly based on the association with metal working debris such as slag and technical ceramics. This is the case for example at Umm an-Nar Island[289] at the coast and Wadi al-Hilo[290] in the inland of the United Arab Emirates, Zahra and Wadi Fizh in the Batinah[291] as well as Maysar[292] and Al-Khashbah[293] in central Oman. These assemblages also yield, besides grinding stones, a large number of hammer stones that were used for crushing the ore and slag. Grinding stones are more often seen as tools in food production processes, e.g., at Bat,[294] Umm an-Nar Island,[295] and Maysar,[296] but also at Rumailah.[297] This interpretation has, however, so far only been clearly demonstrated by starch grain and use wear analyses at Muwailah, Mleiha and Tell Abraq, where *Triticum* and *Hordeum* sp. were identified.[298] For Tell Abraq, the excavators propose that the large quantities of hammer stones found were used for opening sea shells.[299] At Tomb 401 in Bat it could be demonstrated that hammer stones were employed in trimming the façade stones of the tomb.[300] Several ground stone tools, in particular grinding stones, were found in third millennium BCE tombs, for example at Bat[301] and on Umm an-Nar Island.[302] It is generally assumed that ground stone tools from tombs were remains of funerary feasts, in which they were employed in food preparation,[303] personal belongings of the deceased[304] or status symbols.[305] Ground stone tools are also attributed with a symbolic function as they transform a product from one state to another, comparable to the passage from life to death.[306]

Wadi Suq period and Late Islamic ground stone tool assemblages from Eastern Arabia, that would fit the time range of the material from Tawi Said, are as good as unpublished. Wadi Suq period grinding stones are known from Shimal,[307] Tell Abraq,[308] and Khor Fakkan.[309] Jasim[310] assumes that the stone slabs with heavy abrasion traces were used for grinding cereals and those with incisions likely for cutting meat and fish. The use of ground stone tools in the Late Islamic period is virtually unexplored, aside from the fact that rotation querns were employed in the region at that time alongside with grinding stones with a back and forward motion.[311] No evidence for rotation querns was found at Tawi Said. Interestingly, in the Emirate of Fujairah, it has been reported that members of the semi-mobile Shihuh tribe travelled during the summer months from the mountains to the coast to sell goats and pottery vessels but also grinding stones.[312]

281 Davis 1999.
282 Pozo Rodríguez – Ma Córdoba Zoilo 2002.
283 Cleuziou 1989a: 73.
284 Boucharlat – Lombard 1983: 61.
285 Costa 2016; Böhme – Ali Al-Sabri 2011.
286 Weisgerber 1980; Weisgerber 1981.
287 Döpper 2020a; Döpper 2021d.
288 Gaultier *et al.* 2005: 7.
289 Frifelt 1995: 209–210.
290 Kutterer 2013a.
291 Costa – Wilkinson 1987: 97–98, 105; Weisgerber 1987: 148.
292 Weisgerber 1980: 88; Weisgerber 1981: 192–193, 195 Abb. 19.
293 Döpper 2020a; Döpper 2021d.
294 Costa 2016: 256.
295 Frifelt 1995: 200–202.
296 Weisgerber 1981: 197; Abar in prep.
297 Boucharlat – Lombard 1983: 61.
298 Davis 1998; Potts 2000: 70–71; Davis 1999.
299 Potts 1991a: 99.
300 Böhme – Ali Al-Sabri 2011: 119.
301 Böhme – Ali Al-Sabri 2011: 148.
302 Frifelt 1991: 104–111.
303 Ebeling 2002: 149.
304 Ebeling 2002: 150.
305 Rosenberg – Nadel 2014.
306 Rosenberg – Nadel 2014: 788.
307 Vogt – Franke-Vogt 1987: 81.
308 Potts 2000: 70–71; Potts 1991b.
309 Jasim 2000: 166 fig. 17, 183 fig. 48–49.
310 Jasim 2000: 152.
311 Rees *et al.* 2012: 323 fig. 4.
312 Ziolkowski – Al-Sharqi 2005: 237.

8 Seashells (Stephanie Döpper)

8.1 Shell families

544 seashell fragments were found during the Tawi Said survey in 2018. They represent the second largest class of finds identified during the survey after pottery. Determining the different shell families represented was often difficult due to the small size of the fragments preserved. 50.6 % (275 pieces) were too small to be categorised into a specific family. For 91 of these, it was at least possible to classify them as bivalves, most likely from the families of *Mactridae* (surf clams), *Tellinidae* or *Veneridae*, 14 to gastropods from the families *Strombidae*, *Thaididae* (rock shells) or *Certhiidae* and four to gastropods of the families *Conidae* or *Tellinidae*. The families for the remaining 269 seashells were determined with more certainty, depending on the degree of preservation. These are in descending order of their numbers: *Arcidae* (ark shells), *Pectinidae* (scallops), *Cypraeidae* (cowries), *Ostreidae* (oysters), *Cardiidae* (cockles), *Tellinidae*, *Strombidae*, *Ficidae* (fig shells), *Mytilidae* (mussels), *Fissurellidae* (keyhole limpets), *Donacidae*, *Architectonicidae* (sundial shells), *Terebridae* (auger shells), *Cerithiidae*, *Naticidae* (moon shells or necklace shells) and *Marginellidae* (Tab. 10). Only six of these are completely preserved. Roughly 68 % of these fragments, where a distinction between gastropods and bivalves is possible, belong to bivalves.

Family	Number	Percentage
Architectonicidae	3	0.6
Arcidae	86	15.8
Cardiidae	27	5.0
Cerithiidae	2	0.4
Cypraeidae	38	7.0
Donacidae	3	0.6
Ficidae	7	1.3
Fissurellidae	3	0.6
Marginellidae	1	0.2
Mytilidae	5	0.9
Naticidae	1	0.2
Ostreidae	30	5.5
Pectinidae	40	7.4
Strombidae	11	2.0
Tellinidae	11	2.0
Terebridae	2	0.4
Indet.	274	50.4

Tab. 10: Seashells from Tawi Said.

The most common family are *Arcidae* shells with 86 fragments (Fig. 65). These bivalves occur both on hard surfaces in littoral and sublittoral habitats as well as in soft sediments or attached to sand grains or gravel on all of Eastern Arabia's coasts.[313] *Pectinidae*, scallops, are characterised by their 'ears' and well-known for their edible flesh (Fig. 76).[314] They live commonly on rocks and are often visible at low tide in the waters of Eastern Arabia.[315] During the Tawi Said survey, 40 fragment of this family were recorded. Further, there were 38 fragments of *Cypraeidae* gastropods, better known as cowries (Fig. 68). TWS18A-04665 represents a *Cypraea caputserpentins*, although its original colour seems to have faded from exposure to sunlight. This species is commonly found on the coasts of southern Oman and Masirah.[316] *Ostreidae*, oysters, were present with 30 pieces, representing another edible species (Fig. 75). The live cemented on different substrates on the coasts of Oman.[317] 27 fragments of *Cardiidae*, cockles, were found at Tawi Said (Fig. 66). These bivalves prefer to live in sandy or muddy areas and thus in shallow water.[318] *Tellinidae* (Fig. 79) and *Strombidae* (Fig. 77) shells are represented by eleven fragments each in the Tawi Said survey. *Tellinidae* bivalves occur in a wide range of habitats along

313 Bosch *et al.* 1995: 205.
314 Bosch – Bosch 1982: 159.
315 Bosch *et al.* 1995: 230.
316 Bosch *et al.* 1995: 72.
317 Bosch *et al.* 1995: 226.
318 Bosch – Bosch 1982: 171.

the coasts of Oman,[319] while *Strombidae* are commonly found in sandy areas.[320] The latter are characterised by their 'stromboid notch' more or less strongly indented near the anterior.[321] *Ficidae* or fig shells are elegantly curved, thin shells (Fig. 70). Their shape makes them useful as instruments for feeding babies.[322] They are sand burrowers and therefore rarely found alive in shallow waters, but often washed ashore.[323] *Mytilidae*, a shell family that includes the familiar mussels, live attached to rocks or buried in soft or mixed sediments (Fig. 73).[324] Most of the *Donacidae* species, of which three have been recorded in Tawi Said, prefer sandy beaches (Fig. 69).[325] *Fissurellidae* are well represented in rocky places throughout Eastern Arabia.[326] Three of these shells were recorded during the Tawi Said survey (Fig. 71). There are also three fragments of *Architectonicidae*, sundial shells, a shell family that is most commonly found in Eastern Arabia washed ashore (Fig. 85).[327] Two examples each were recorded from Tawi Said of *Cerithiidae* (Fig. 67) and *Terebridae* (Fig. 78). *Cerithiidae* are common among the gastropods around the coasts of Oman. They prefer intertidal zones, living among rocks and algae, often in silty or muddy places or on patches of sand or rubble in coral reefs.[328] *Terebridae*, auger shells, can be found in sand in shallow waters, usually around the tide mark.[329] TWS18A-06039 can possibly be identified as *Terebra*

Fig. 65: Seashell of *Arcidae* family (TWS18A-05969).

Fig. 66: Seashell of *Cardiidae* family (TWS18A-03584).

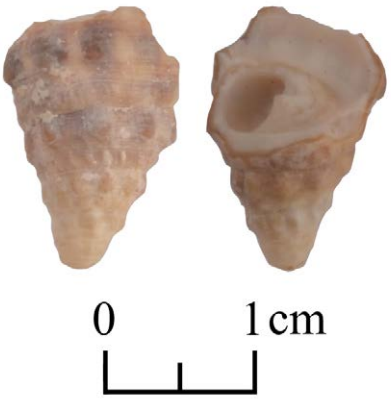

Fig. 67: Seashell of *Cerithiidae* family (TWS18A-06011).

Fig. 68: Seashell of *Cypraeidae* family (TWS18A-04665).

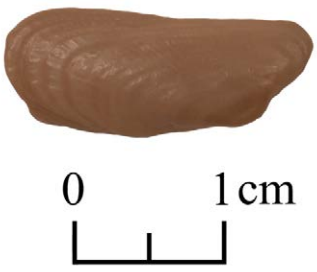

Fig. 69: Seashell of *Donacidae* family (TWS18A-07156).

319 Bosch *et al.* 1995: 251.
320 Bosch *et al.* 1995: 60.
321 Bosch – Bosch 1982: 58.
322 Bosch – Bosch 1982: 87.
323 Bosch *et al.* 1995: 91.
324 Bosch *et al.* 1995: 214.
325 Bosch *et al.* 1995: 258.
326 Bosch *et al.* 1995: 30.
327 Bosch *et al.* 1995: 172.
328 Bosch *et al.* 1995: 51.
329 Bosch *et al.* 1995: 170.

Fig. 70: Seashell of *Ficidae* family (TWS18A-04650).

maculata. *Naticidae*, represented by only one piece at Tawi Said, are small, sand-dwelling moon snails (Fig. 74)[330] and *Margninellidae*, also present with only one example, is a tiny shell, common in Eastern Arabia, often found burrowed below the sand or under rocks (Fig. 72).[331] For other archaeological sites in Oman, it is assumed that shells were gathered empty on beaches rather than alive.[332] This is, however, unlikely apply to most of the edible species that were gathered for food consumption.[333]

The natural distribution range of the seashell families attested at Tawi Said indicate that all of them occur on the coasts of Oman. The Indian Ocean coast can be reached at about 105 km east of Tawi Said. The northern Arabian Gulf coast is closer, with a distance of only 65 km, but that would require crossing the Hajar Mountains. From historical sources, it is well-known that there was regular movement by Bedouin communities between the Indian Ocean coast and the interior along the corridor at the

330 Bosch *et al.* 1995:
331 Bosch *et al.* 1995: 146.
332 Wilkens 2005: 163; Gardner 2005: 9.
333 Hellyer – Hornby 2007: 76.

Fig. 71: Seashell of *Fissurellidae* family (TWS18A-5480).

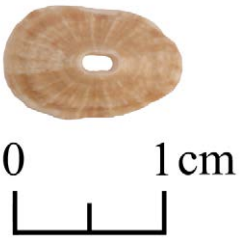

Fig. 72: Seashell of *Marginellidae* family (TWS18A-07182).

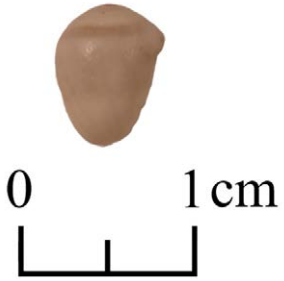

Fig. 73: Seashells of *Mytilidae* family (TWS18A-04084, TWS18A-04274, TWS18A-04484, TWS18A-07210, TWS18A-07403).

Fig. 74: Seashell of *Naticidae* family (TWS18A-07439).

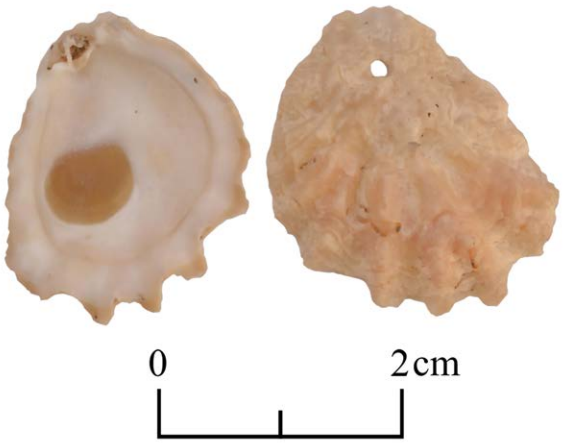

Fig. 75: Seashell of *Ostreidae* family (TWS18A-04939).

Fig. 76: Seashell of *Pectinidae* family (TWS18A-05454).

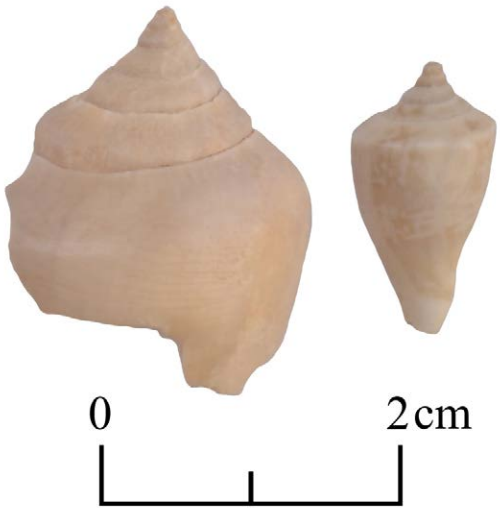

Fig. 77: Seashells of *Strombidae* family (TWS18A-00480 and TWS18A-07219).

Fig. 78: Seashell of *Terebridae* family (TWS18A-06039).

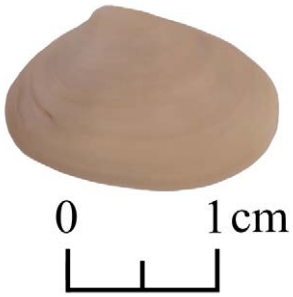

Fig. 79: Seashell of *Tellinidae* family (TWS18A-07155).

southern foothills of the Hajar Mountains (chapter 11.3). ElMali describes how, traditionally, people from the coast would salt the bulk of their mollusc harvest, leave them to dry for several days and then sell them to Bedouins from the interior.[334]

8.2 Spatial distribution

There is little spatial grouping visible within the seashell distribution at Tawi Said despite a concentration in the northeastern part of the survey area (Fig. 80). This fits the distribution of the Late Islamic pottery (chapter 2.4.5). Therefore, it can very tentatively be assumed that most of the seashells came to Tawi Said during that period. Marine shells are typical for the finds repertoire of other Late Islamic campsites.[335]

334 ElMali 1999: 50.

335 Gardner 2005; Hellyer – Hornby 2007.

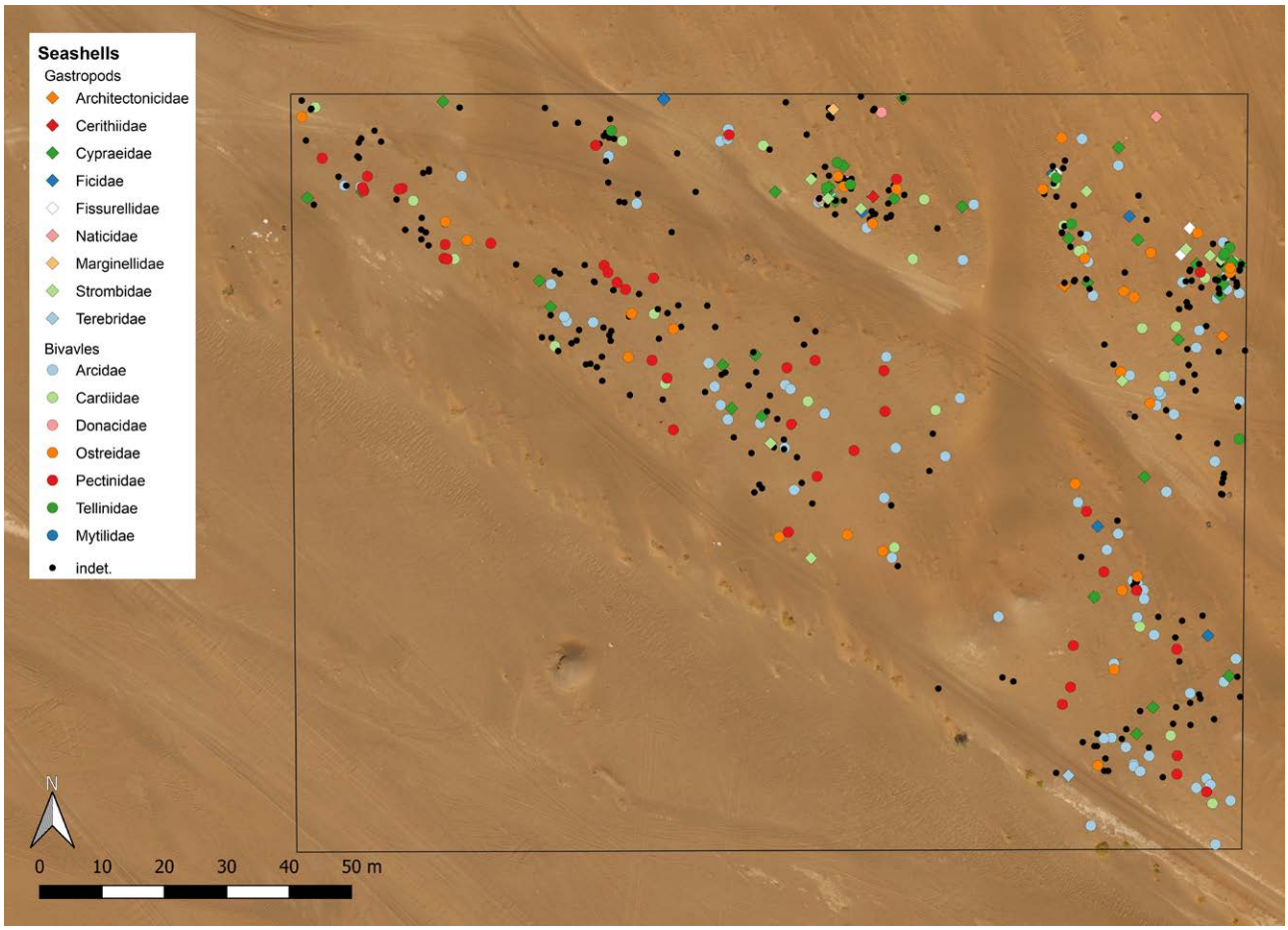

Fig. 80: Distribution of seashells.

8.3 Modified shells

Beside the large quantities of unworked shells, which were likely brought to Tawi Said because of their nutritional content, several modified pieces of seashells were recorded during the 2018 survey, in addition to the finished shell personal adornments presented in chapter 4. These are worked pieces of shells and shell debris indicating early stages of shell adornment production, burned fragments and one fragment with a green substance on its surface (Fig. 81).

TWS18A-06107, a fragment of a bivalve with an even surface, likely of the families *Mactridae* (surf clams), *Tellinidae* or *Veneridae*, was found in the northwestern corner of the survey area (Fig. 81). It displays a green substance on its interior, likely originating from contact with corroded copper objects. Bivalve shells have, however, frequently been used as cosmetic containers for various products, including atacamite, which would also leave green traces. Shells with atacamite have for example been found in Early Bronze Age levels from Ras al-Hadd HD-5,[336] at the second to first millennium BCE tombs complex LCG2 at Dibba,[337] and in Iron Age levels at Tell Abraq.[338] All ten shell fragments with traces of burning belong the *Pectinidae* family, amounting to 25 % of the total fragments of this shell family found at Tawi Said. They were found around the sand dunes in the east of the survey area (Fig. 81). Likely, the traces of burning can be associated with them being used as lamps, as for example has been demonstrated at Sumhuram.[339] However, most fragments from Tawi Said were burned on the outside (Fig. 82), contradicting the idea of them being used as lamps. Likely they simply came into contact with a fireplace.

Among the worked pieces and production debris, there are five main types: oval-shaped and smoothed pieces of *Arcidae* and *Cardiidae* shells (Fig. 83), inner spirals of gastropod shells, most likely production debris, worked upper parts of *Conidae* or *Tellinidae* shells, shells of the

336 Borgi *et al.* 2012: 33.
337 Genchi *et al.* 2018: 110 fig. 9d, 111.
338 Thomas – Potts 1996.
339 Wilkens 2005: 164–165.

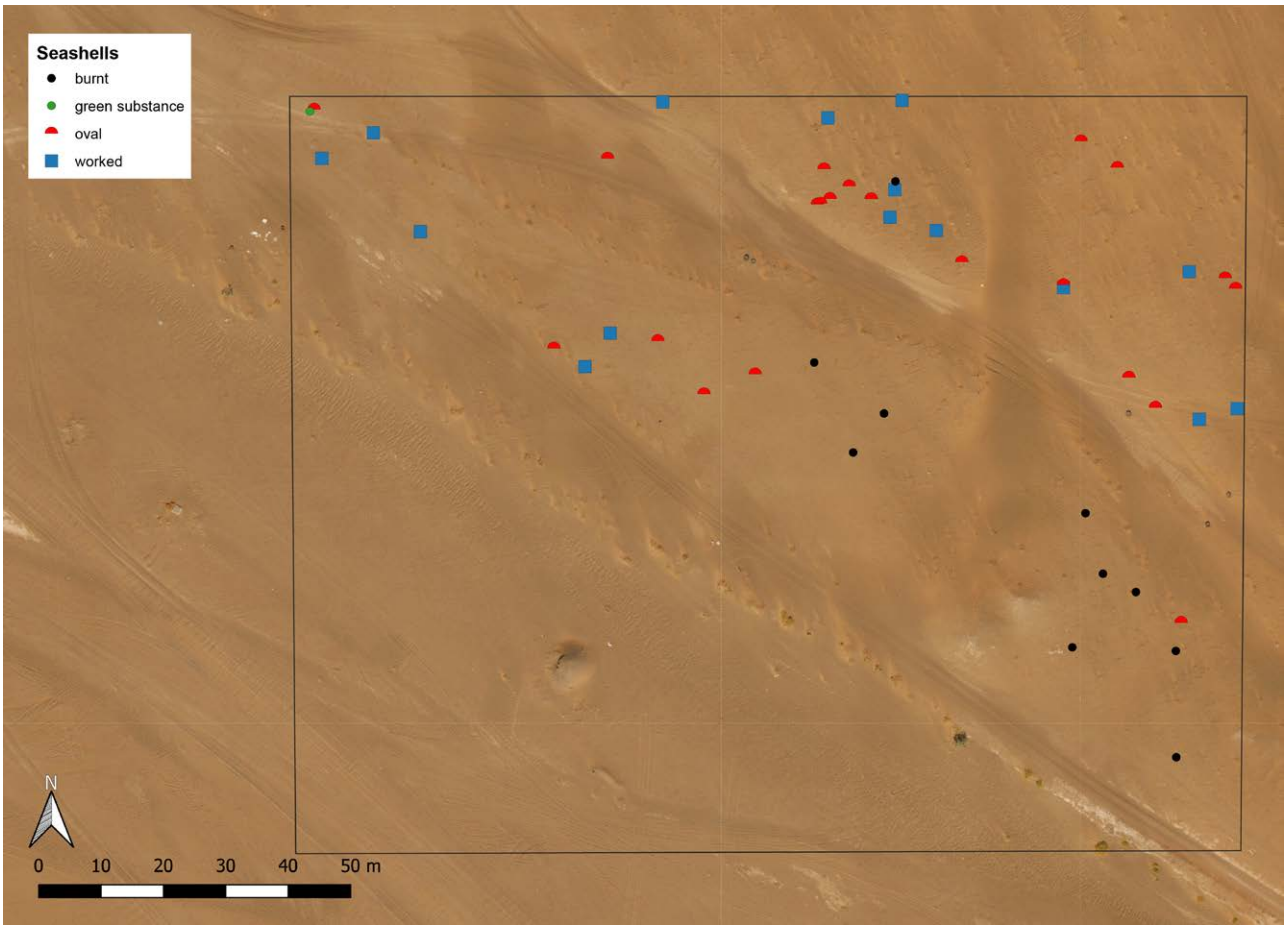

Fig. 81: Distribution of modified seashells.

Fig. 82: Burnt shells of the *Pectinidae* family (TWS18A-00407 and TWS18A-07212).

Architectonicidae family, whose bottom part is missing (Fig. 85) and a *Cypraeidae* shell, TWS18A-05379, whose dorsa has been removed (Fig. 86). The oval smoothed pieces could very well be preforms for the flat cylindrical shell beads of type m (chapter 4.1.3). For this, one valve of a bivalve shell is cut into shape and then smoothed around the edges until it takes a circular form. The inner spirals of the gastropod shells could be production debris of disc-shaped beads or shell rings.[340] For this, only the upper parts of the gastropod shells are needed, and the rest cut off. Interestingly, *Engina mendicaria* shells of the *Pisaniidae* family and *Conidae* shells appear almost exclusively as completely finished adornment pieces (chapters 4.1.10, 4.1.11, 4.1.13 and 4.3). This suggests that they were not manufactured on site. Pendants made from *Arcidae*, *Tellinacae* or *Veneridae* shells (chapter 4.2), much better fit the range of shells present at the site.

340 Charpentier 1994.

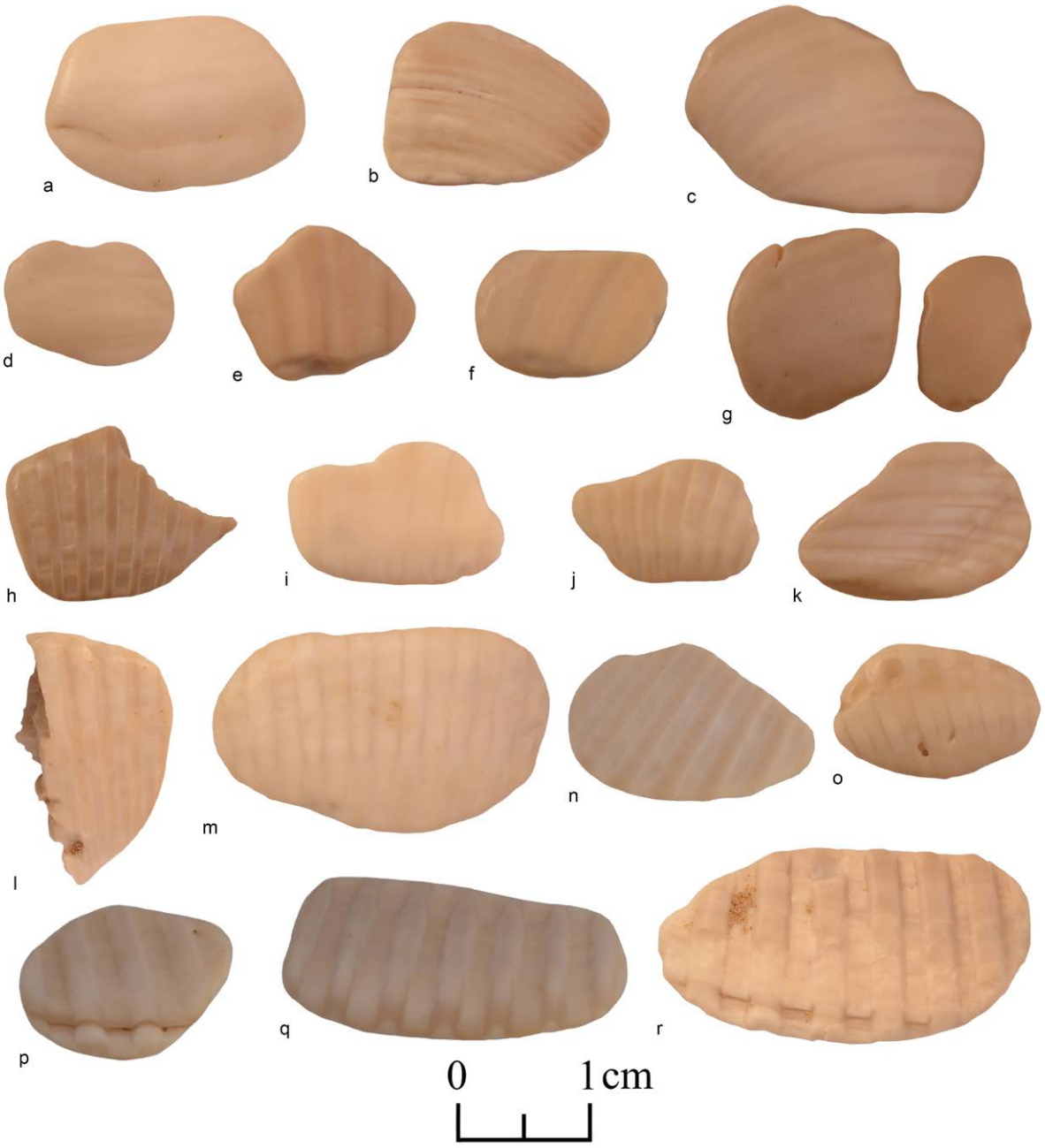

Fig. 83: Oval-shaped and smoothed pieces of *Arcidae* and *Cardiidae* shells (a. TWS18A-01590, b. TWS18A-02200, c. TWS18A-05118, d. TWS18A-07110, e. TWS18A-04688, f. TWS18A-05976, g. TWS18A-07154, h. TWS18A-03038, i. TWS18A-07236, j. TWS18A-05530, k. TWS18A-04891, l. TWS18A-06696, m. TWS18A-03719, n. TWS18A-07133, o. TWS18A-07134, p. TWS18A-07135, q. TWS18A-07384 and r. TWS18A-07425).

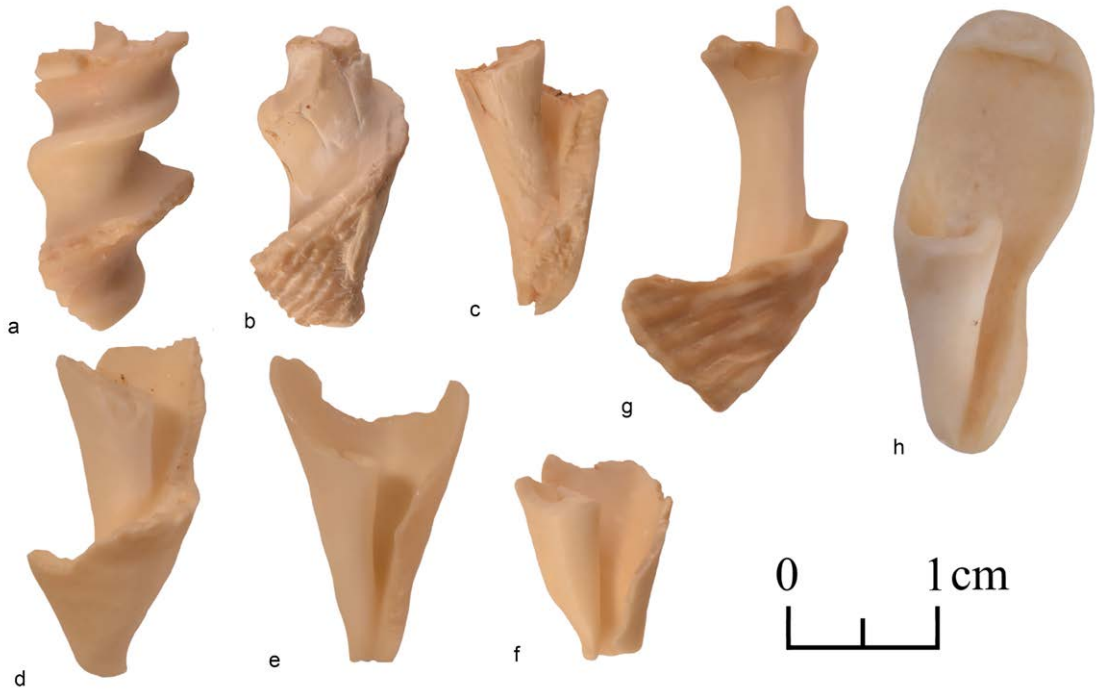

Fig. 84: Inner spirals of gastropods (a. TWS18A-02953, b. TWS18A-03518, c. TWS18A-03714, d. TWS18A-05939, e. TWS18A-07097, f. TWS18A-07261, g. TWS18A-07274 and h. TWS18A-07251).

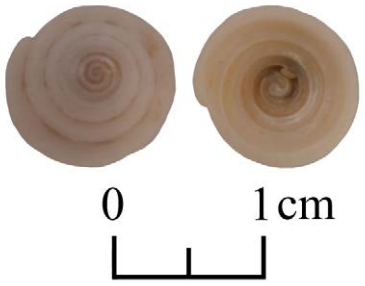

Fig. 85: Shell of the *Architectonicidae* family with bottom part missing (TWS18A-04081).

Fig. 86: Shell of the *Cypraeidae* family with removed dorsa (TWS18A-05379).

9 Metal Objects (Stephanie Döpper)

The metal objects found during the Tawi Said survey can be divided into two categories: worked pieces and remains of copper production. The former includes copper alloy needles, chisels, rings, pins and plates. The remains of copper production amount to eight crucible or furnace fragments, 13 prills, 20 small copper pieces, seven tiny pieces of copper ore and 258.8 g of slag. The densest concentration of metal objects and remains of metal production were found in the central to northwestern part of the survey area (Fig. 87).

9.1 Worked metal items

9.1.1 Copper alloy needles

One complete and one end fragment of a copper needle have been found at Tawi Said. The complete one, TWS18A-00269, is characterised by a mushroom-shaped head and measures 71.5 mm in length, where the lower 22 mm are deformed (Fig. 88a and Fig. 89). The needle has an oval to sub-rectangular cross section with a diameter of 6.6 mm that tapers towards the end. The whole objects weighs 4.2 g and was found in the northern

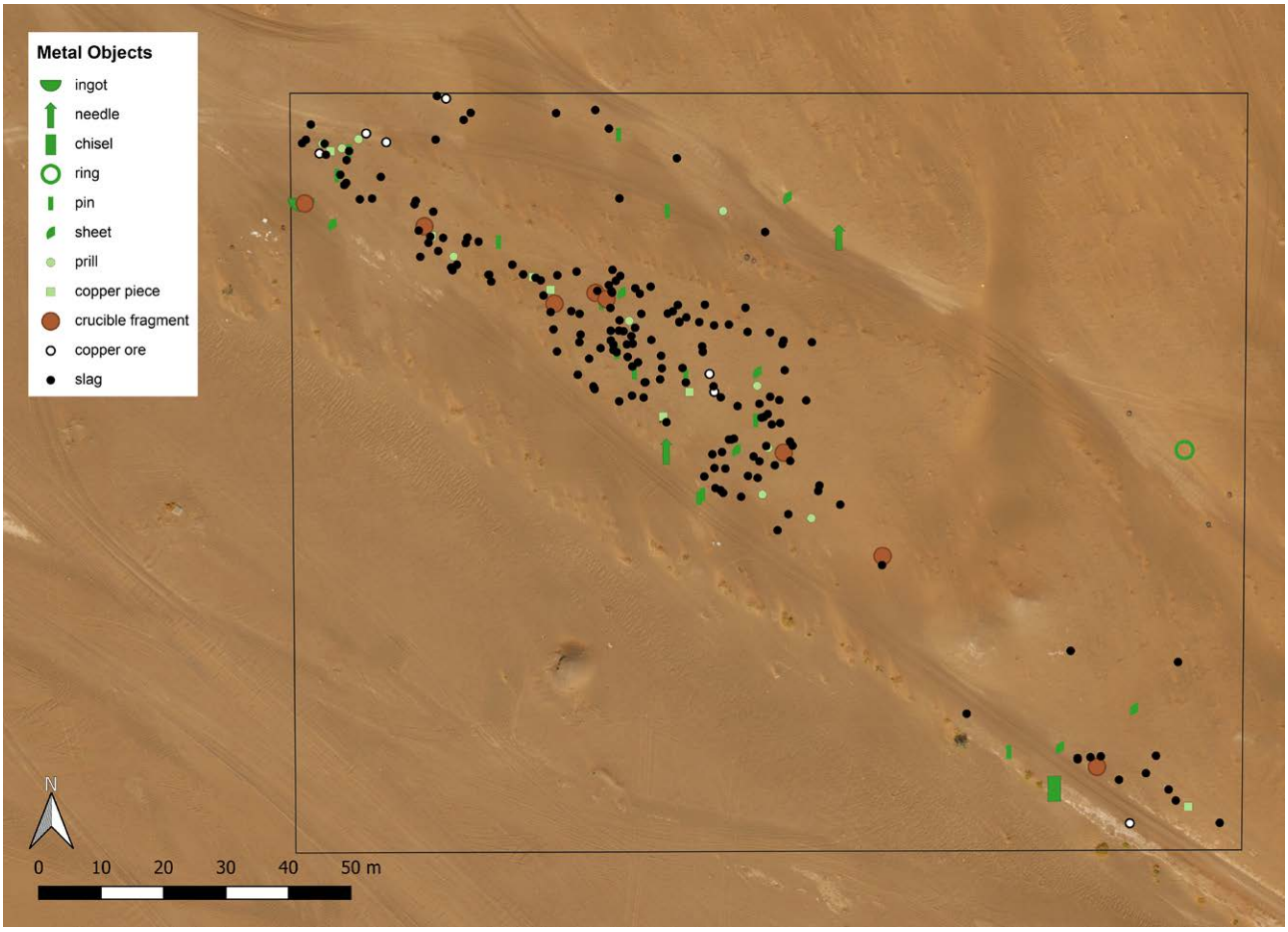

Fig. 87: Distribution of metal objects and remains of metal production.

part of the survey area (Fig. 87). It likely dates to the Late Islamic period. TWS18A-01925 is the upper 27.7 mm of a copper alloy needle (Fig. 88b). The last 13 mm of the copper bar are turned down to form the eye of the needle. This is oval and measures 3 mm in length and 1 mm in width. The needle itself has an oval diameter of 6.6 x 8.3 mm. It weighs 4.2 g. The piece was discovered in the central part of the survey area (Fig. 88). Two needles with a similar eye and long curving forms were discovered in the Umm an-Nar period warehouse on Umm an-Nar Island. Frifelt[341] suggests that they were, because of their curved shape, used to sew mats together for roof cover and for carpets on the floor. Another needle with this type of eye was found in Iron Age levels from Saruq al-Hadid.[342]

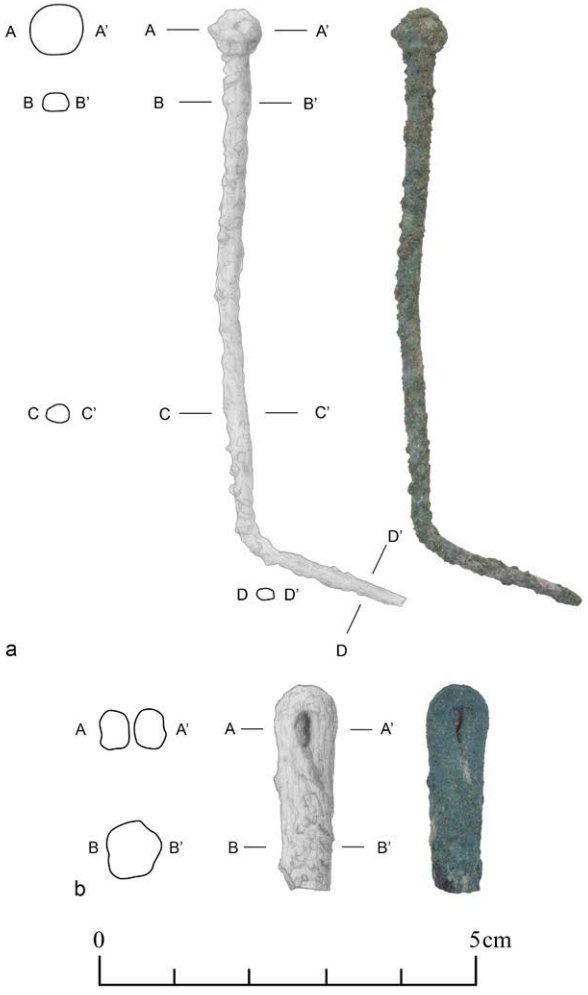

Fig. 88: Copper alloy needles (a. TWS18A-00269 and b. TWS18A-01925).

9.1.2 Copper alloy chisel

TWS18A-04163 is the possible lower end of a copper alloy chisel (Fig. 90). It is preserved to a length of 29 mm and has a square cross section measuring 9.8 x 9.8 mm that tapers towards the preserved end. Here, it is wider than the square body of the chisel. The fragment has a weight of 9.4 g and was found in the southeastern part of the survey area (Fig. 87). It brings to mind the shape of the spatula found at Tomb 76/1 in Dibba,[343] because of the long use of the tomb from the Wadi Suq to the late pre-Islamic period; however, it is not useful to derive any chronological placement from this. Another similar artefact to this type of object comes from the Umm an-Nar period Grave 1 at Maysar 4.[344] The object from Maysar, is, however, larger and referred to as an axe. Another axe, also much larger than the piece from Tawi Said, was discovered at Ras al-Jinz RJ-2 dating to

Fig. 89: TWS18A-00269 *in situ*.

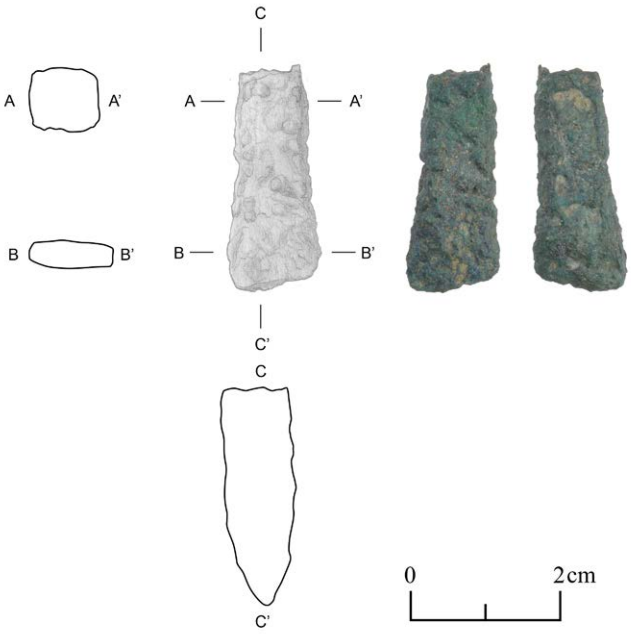

Fig. 90: Copper alloy chisel (TWS18A-04163).

341 Frifelt 1995: 190, 196 fig. 278.
342 Weeks *et al.* 2017: 49 fig. 19.SF 30954.
343 Pellegrino *et al.* 2019: 58 fig. 27.26.
344 Weisgerber 1983: pl. 7.

the Umm an-Nar period.[345] The same is true for a chisel or axe from Umm an-Nar Island,[346] while a second one is much closer in size to the object from Tawi Said.[347]

9.1.3 Copper alloy ring

TWS18A-05083 is nearly half of a copper alloy ring with a diameter of 6.2 mm (Fig. 91). Its oval cross section measures 1.3 x 0.8 mm. As only one end is broken off, the ring was likely originally not closed. Due to its small size, it might be an earring. The fragment weighs less than 0.1 g and was found in the northeastern part of the survey area (Fig. 87).

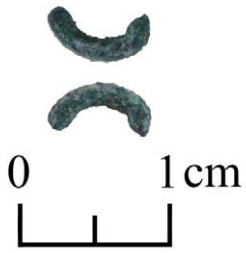

Fig. 91: Copper alloy ring fragment (TWS18A-05083).

9.1.4 Copper alloy pins and plates

13 small copper alloy pins come from the Tawi Said survey (Fig. 92). Except for one, they are all broken off at one or both ends. They measure between 7.0 and 27.8 mm in length and have in most cases a circular cross section with a diameter between 1.6 x 5.8 mm. Their weight lies between less than 0.1 and 2.0 g. Some of the pieces have constant thickness, while TWS18A-06213, TWS18A-06708 and TWS18A-06728 taper towards the preserved original end. TWS18A-03310 thickens towards one end, and TWS18A-03855 towards both ends. The function of these pieces is not clear, but they might be fragments of copper alloy pins, needles or even fishhooks. TWS18A-00990 is special, as the copper alloy pin seems to enclose a copper wire that protrudes from both ends. Most of the copper alloy pin fragments were found in the central and northwestern part of the survey area (Fig. 87).

There are eight copper plate fragments of unknown function (Fig. 93). They have a length between 3.6 and 16.6 mm, a width between 2.1 and 3.8 mm and a

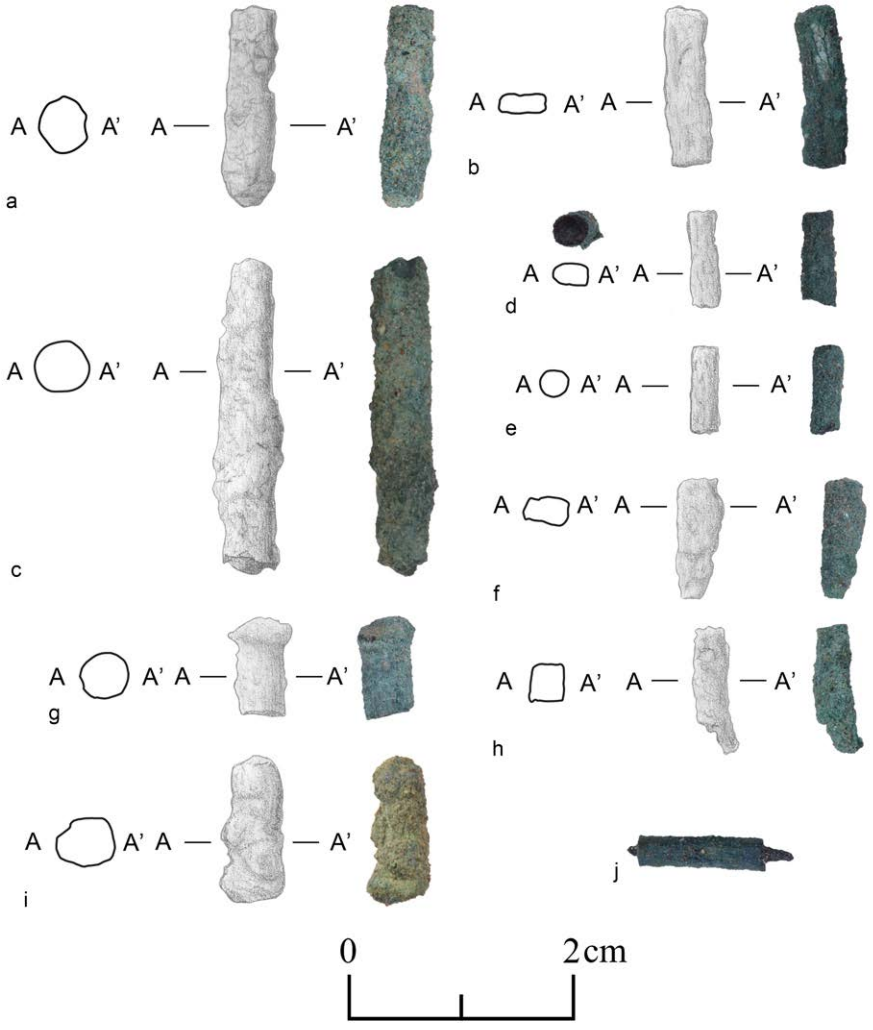

Fig. 92: Copper alloy pins (a. TWS18A-01899, b. TWS18A-02585, c. TWS18A-01902, d. TWS18A-02627, e. TWS18A-06239, f. TWS18A-06708, g. TWS18A-03310, h. TWS18A-06728, i. TWS18A-03855 and j. TWS18A-00990).

345 Giardino 2017: 75 fig. 7.20.
346 Frifelt 1995: 195 fig. 276.
347 Frifelt 1995: 197 fig. 279VB.

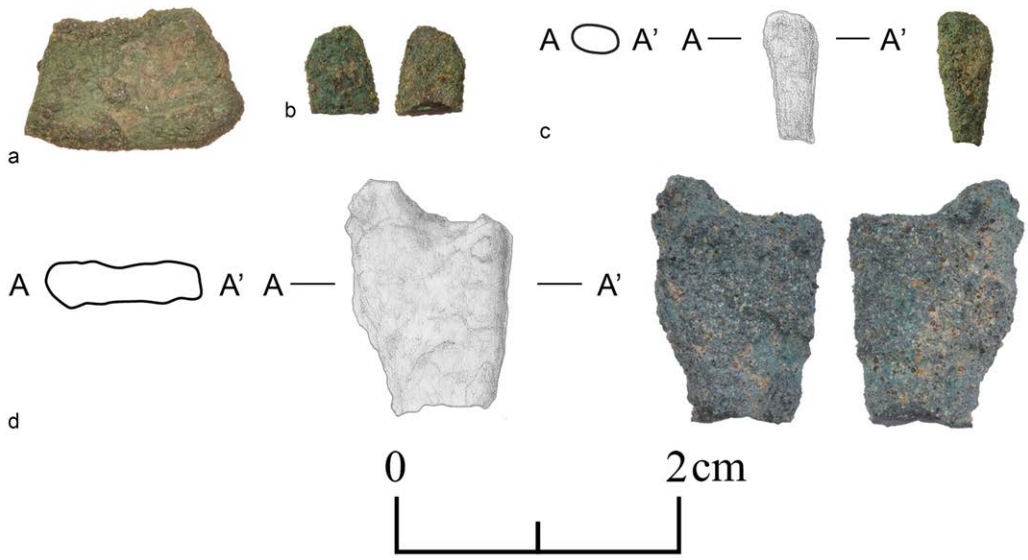

Fig. 93: Copper alloy plates (a. TWS18A-00917, b. TWS18A-01139, c. TWS18A-02469 and d. TWS18A-04756).

thickness between 1.5 and 11.7 mm, demonstrating the great variation in this group. The smaller pieces weigh less than 0.1 g, and the largest one 1.9 g. The copper plate fragments are distributed all over expect for in the wadi (Fig. 87).

9.2 Slag, technical ceramics and other metal production remains

Evidence for copper processing at Tawi Said comes from various remains of copper processing waste including slag, copper ore, crucible or furnace fragments and copper prills. 172 pieces of slag were found during the survey, together weighing 258.8 g (Fig. 94). The largest one, TWS18A-01256, can be classified as a fragment of a large flow slag of Hauptmann's[348] type A. Many large air bubbles are visible in the upper part of the fragment. Most of the slag from Tawi Said, however, belongs to Hauptmann's[349] types C and D, thin flow slags and drop slags. The slag is concentrated in the central part of the survey area (Fig. 87). The same is true for the 13 copper prills documented in the survey (Fig. 95). These spherical copper splashes resulting unintentionally during copper smelting, are rather small and weigh between less than 0.1 and 1.4 g. Besides this, seven small, irregular shaped pieces of copper were found, that most likely also originate from the copper smelting process. In addition, there are seven small pieces of copper ore, weighing less than one gram each. Four of them were found in the northeastern corner of the survey area, two in the central part and one in the southeast (Fig. 87). Furthermore, eight pieces of crucible or furnace fragments were discovered, six of them with a slag layer on their surface (Fig. 96). The fragments are small, measuring between 15 and 31 mm in length, between 9 and 29 mm in width and between 4 and 15 mm in height. Their weight is between 0.6 and 14.2 g. All of them are made of coarsely mineral and/or chaff-tempered clay of a beige to red colour. The furnace fragments can be found spread along a line from the southeastern to the northwestern corner of the survey area (Fig. 87).

A special piece is a fragment of a planoconvex or 'bun-shaped' copper ingot, TWS18A-06054 (Fig. 97). It has a flat surface and a convex bottom. The piece measures 95 mm in length, 38 mm in width and 24.7 mm in height. It weighs 40.3 g. Based on the curve of the external edge, a diameter of 130 mm can be reconstructed, which would result in an original weight of approximately 500 to 600 g. The ingot comes from the northwestern corner of the survey area (Fig. 87). Planoconvex copper ingots are characteristic of the third millennium BCE in Eastern Arabia.[350] Comparable ingots were found for example at Umm an-Nar period sites such as Al-Aqir,[351] Maysar,[352] Bilad al-Mayadin,[353] Ras al-Hadd HD1,[354] Wadi al-

348 Hauptmann 1985: 38.
349 Hauptmann 1985: 38–39.
350 Weisgerber – Yule 2003: 48–49; Giardino 2017: 101–103.
351 Weisgerber – Yule 2003; Giardino 2017: 101 fig. 9.8; Weisgerber 1983.
352 Weisgerber 1983: 275 fig. 3; Weisgerber 1980; Weisgerber 1981.
353 Weisgerber 1981: 211 fig. 43.4.
354 Giardino 2017: 103 fig. 9.10; Cattani *et al.* 2019: 70; Craddock – La Niece – Hook 2003.

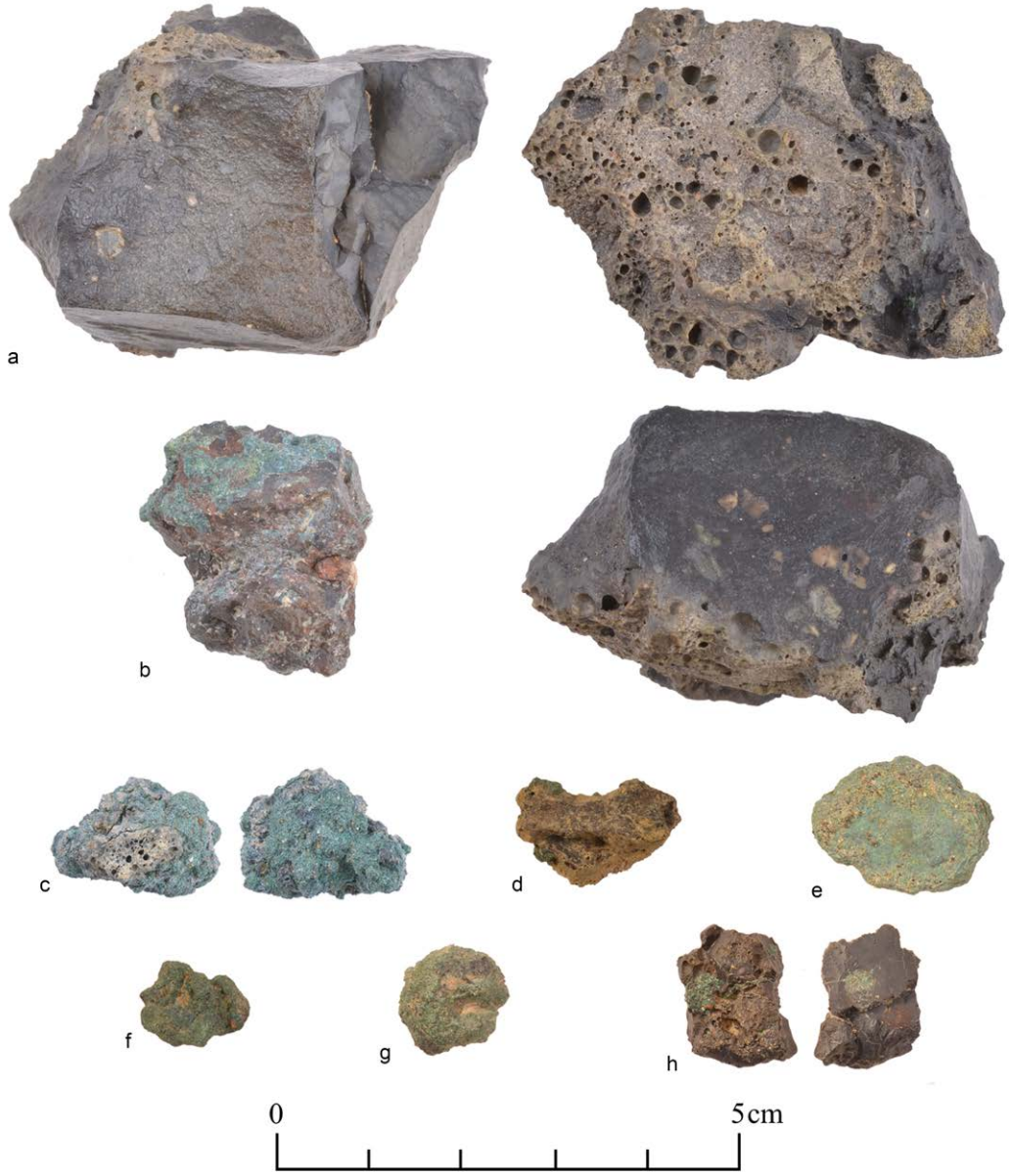

Fig. 94: Slag (a. TWS18A-01256, b. TWS18A-0614, c. TWS18A-00819, d. TWS18A-02408, e. TWS18A-03050, f. TWS18A-03221, g. TWS18A-03421 and h. TWS18A-04156).

Fig. 95: Copper prills (a. TW18A-00494, b. TWS18A-00923, c. TWS18A-02431, d. TWS18A-03092, e. TWS18A-06147, f. TWS18A-06234, g. TWS18A-06292, h. TWS18A-01093, i. TWS18A-01023, j. TWS18A-06819 and k. TWS18A-03585).

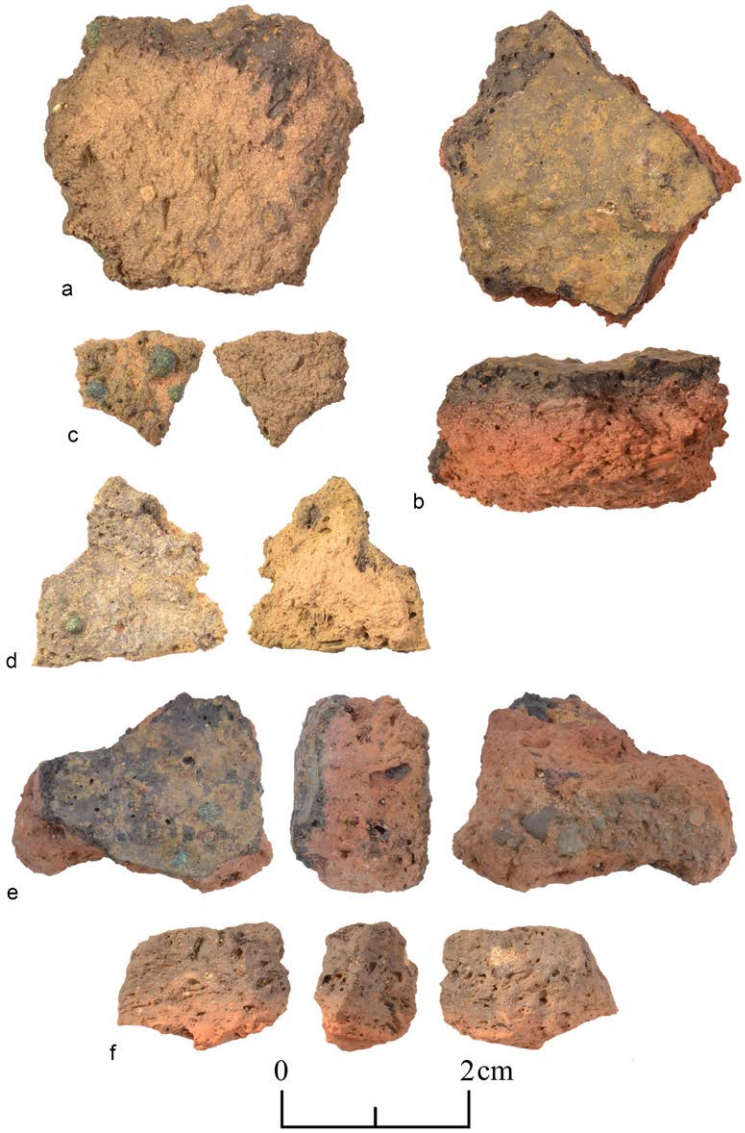

Fig. 96: Technical ceramics (a. TWS18A-00183, b. TWS18a-07475, c. TWS18a-00692, d. TWS18A-03130, e. TWS18A-04196 and f. TWS18A-06052).

Hilo[355] and Umm an-Nar Island.[356] From the Wadi Suq period, so far only a single copper ingot is known from Tell Abraq. This is of a pyramidal shape and broken, but still weighing 2990 g.[357] Planoconvex copper ingots are also recorded from Iron Age sites including Saruq al-Hadid,[358] Uqdat al-Bakra[359], Salut[360], Masafi-1[361] and possibly Manal.[362]

Such planoconvex ingots were produced by melting copper, either freshly produced or in the form of metal scrap from recycling, in crucibles and pouring the liquid copper in flat holes in the ground. Here the metal cooled down. Due to this manufacturing process, the ingots vary in size and weight and have a sandy texture on their bottom surface. On the upper surface, those ingots usually display blisters, which are caused by gas in the solution or air mixed into the metal during pouring. The general large quantities of gas blisters in the material allows the breaking of the copper ingots easily into smaller pieces by hammering. The production of the copper ingots was only the final step in the smelting of the copper ore.[363] Omani copper or is chalcopyrite, where copper is combined with iron and sulphur.[364] While sulphur is removed from the material by roasting the

355 Kutterer – Jasim 2009; Kutterer 2013b: 58, fig. 5.6, 5.12–13.
356 Frifelt 1995: 188 fig. 264.
357 Weeks 1997: 28 fig. 5–6; Potts 1993a: 123.
358 Weeks *et al.* 2017: 50 fig. 20 SF30469.
359 Giardino 2017: 122, 124 fig. 11.12.
360 Degli Esposti – Renzi – Rehren 2016: 83 fig. 2b.
361 Goy *et al.* 2013.
362 ElMali – Ibrahim 2003: 94 fig. 19.
363 Weisgerber 1983: 274.
364 Giardino 2017: 122.

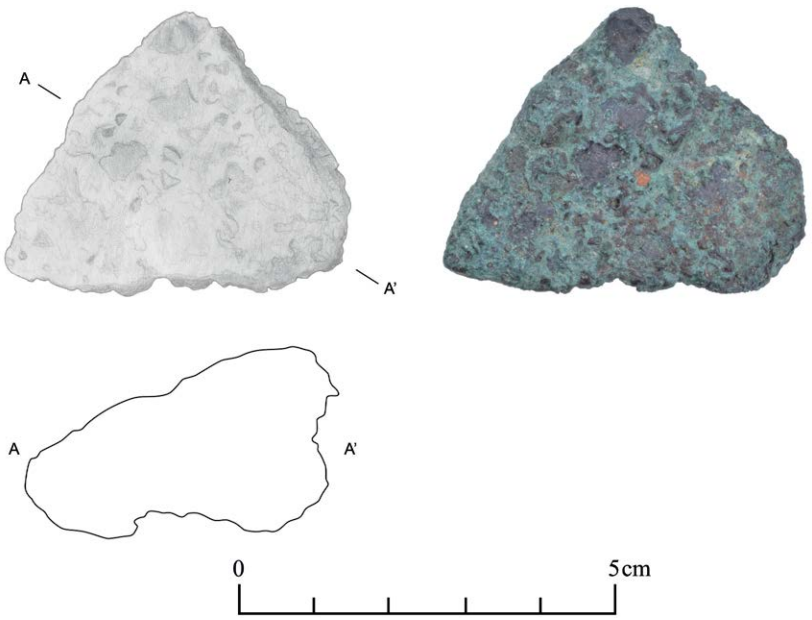

Fig. 97: Copper ingot fragment.

ore, other measures had to be taken to remove the iron impurities as they cause the metal to be brittle. For this, silicatic sand is useful. When sprinkled on the surface of an open crucible with liquid copper, it produces a slag that separates the iron from the copper. It is only after the copper ore in the first step and the sulfidic copper, the matte, had been (re-)smelted, that rather pure copper is obtained from which the copper ingots are made.

According to Yule and Weisgerber,[365] planoconvex copper ingots weighed between 600 and 1890 g, with 50 % of them between 900 and 1200 g. The one from Ras al-Hadd HD1 weighs 590 g and has a diameter of 8 cm. While ingots from Salut have diameters between 6 and 12 cm,[366] the copper ingot from Wadi al-Hilo has a diameter of 15 cm and weighs 4.6 kg, making it the largest and heaviest of those ingots known from Eastern Arabia.[367] Of the Masafi ingots, 139 were found in total, measuring between 7 and 13 cm in diameter and 600 to 2200 g in weight.[368] The ingot from Tawi Said fits well into this general picture. Weisgerber[369] claims that the small planoconvex ingots were convenient for the packing of caravans and for the porters who had to carry their load in bags on their back.

365 Weisgerber – Yule 2003: 49.

366 Degli Esposti – Renzi – Rehren 2016: 83.
367 Kutterer – Jasim 2009: 250.
368 Benoist *et al.* 2012.
369 Weisgerber 2007: 196.

10 Other finds (Stephanie Döpper)

10.1 Clay spindle whorl

TWS18A-05381 is a reused, glazed pottery sherd that was worked into a roughly circular shape and pierced in its centre (Fig. 98). It measures 25 mm in diameter and is 9 mm thick. Likely it was used as a spindle whorl or as a loom weight. The blueish-white glaze on one side of the disc indicates a date of the object in the Late Islamic period. A similar object to the clay spindle whorl, although in a much rougher shape, that raises doubts whether the object really represents a spindle whorl, comes from Late Umm an-Nar Bat.[370] Other pierced discs come from Iron Age contexts of Tell Abraq, where they have been interpreted as loom weights[371] as well as from Iron Age Izki.[372]

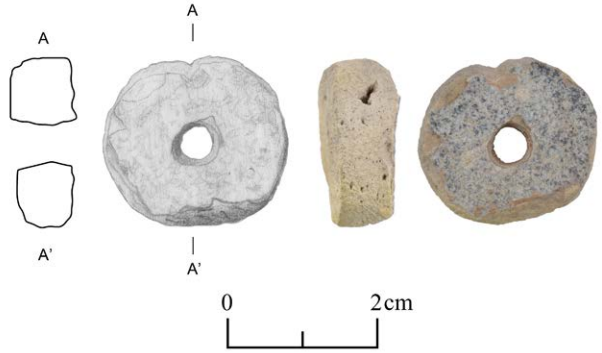

Fig. 98: Pottery spindle whorl (TWS18A-05381).

10.2 Glass kohl stick

TWS18A-04635 is a fragment of a light green glass bar that tapers uniformly towards the preserved end (Fig. 99). The object measures 19 mm in length and 6 mm in diameter at its upper end. It was likely used as a kohl stick. A good parallel comes from 14th–15th century CE Siraf in Iran, which is also made of light green glass.[373] Due to the chemical composition of the glass, it is believed that it was an import from South Asia.[374] Another light green glass kohl stick was found, along with other black coloured ones, at Julfar in the United Arab Emirates.[375] They are dated to around 1630 CE and it is assumed that they were imported from Iran or India.[376] Today, similar sticks made of metal or plastic are still in use in the region. Seashells often featured as containers for the kohl.[377]

Fig. 99: Glass kohl stick (TWS18A-04635).

370 Kerr 2016: 247 fig. 142.
371 Potts 1991b: 103–104, fig. 172–174.
372 Schreiber 2007: Taf. 42.4, 6.

373 Swan *et al.* 2017: 104 fig. 3.
374 Swan *et al.* 2017: 115.
375 Hansman 1985: 79 fig. 18.f–g, pl. IVp–q.
376 Hansman 1985: 76.
377 Richardson – Dorr 2003: 343.

11 Discussion and conclusions (Stephanie Döpper)

11.1 Tawi Said in the wider region

The different materials found at Tawi Said presented in the previous chapters clearly demonstrate that it was integrated in far-reaching trade and communication networks within central Oman and beyond. The nearest sources of gabbro and limestone are in the southern foothills of the Hajar Mountains, located approximately 12 km to the north of the site (Fig. 100). Flint sources for stone artefacts can be found in the westernmost part of the Jebel Khadar massive, approximately 20–25 km away from the site and in the interdunal areas to its southwest (Fig. 21). All raw materials and some finished objects come from much greater distances. The great number of seashells (chapter 8) and shell personal adornment (chapter 4) provides clear indications for interactions with the coast. The Indian Ocean coast of Oman is about 105 km east of Tawi Said. The northern Arabian Gulf coast would be only at a distance of approximately 65 km but going there would require crossing the Hajar Mountains. For Islamic times, regular movement of the Bedouin communities between coast and inland along the corridor at the southern foothills of the Hajar Mountains is attested (section 11.3) and it is the same route that the modern highway follows.

Other materials and objects come from even further afield (Fig. 100). The carnelian for the bead TWS18A-01967 (section 4.1.6) comes most likely from Gujarat, although the bead itself might have been manufactured in Eastern Arabia as it was perforated by pecking and not through sophisticated Indus-style drill holes. The stamp seal TWS18A-02783 (chapter 5) is clearly of Eastern Arabian manufacture, but its general shape is inspired by Dilmun type seals from Bahrain. The Late Islamic glass bangles (section 4.4) and the glass kohl stick (section 10.2) were most likely made in either Iran or India and imported to Eastern Arabia. Further imports are evident among the pottery. The fragments of Black Slipped Indus Jars (section 2.4.1), originate, as the name implies, from the Indus valley. Early Islamic Turquoise Glazed Ware (section 2.4.3) as well as a possible Small Grey Vessel (section 2.4.3) likely come from Iran. An origin from Southern Iran can also be assumed for the Middle Islamic sherds of (Hatched) Sgraffiato (section 2.4.4). The Late Islamic Persian Fritware (section 2.4.5) is also of an Iranian origin, whereas the possible fragments of a Torpedo Jar (section 2.4.5) and Ali Ware (section 2.4.5) come from Bahrain. As Bahla has been the main production centre for Bahla Ware, it is to be assumed that the sherds of this ware found at Tawi Said were also produced at Bahla.

11.2 Tawi Said in the Wadi Suq period

Two major occupation phases are attested at Tawi Said: the Wadi Suq and the Late Islamic periods. Settlements from the Wadi Suq period are rare in the archaeological record of Eastern Arabia, especially in central Oman, which is often associated with a decline in settlement intensity and a return of the population to a predominantly mobile lifestyle.[378] Several possible underlying causes of the significant cultural changes that occurred at the beginning of the second millennium BCE have been suggested. These are a deteriorating climate,[379] an overexploitation of agricultural lands during the Umm an-Nar period,[380] cultural dynamics as a response to an increasing socio-economic hierarchisation[381] and the collapse of international trade along the Gulf.[382] According to Carter,[383] the latter could have severely impacted the society's ability to mobilise labour for major projects such as the monumental towers of the Umm an-Nar period. The copper producing region, i.e.,

378 Al-Jahwari 2008: 340, 345.
379 Sanlaville 1992; Fleitmann *et al.* 2005; Parker *et al.* 2006; Fleitmann *et al.* 2007; Parker – Goudie 2008; Goudie – Parker 2011.
380 Carter 1997: 243.
381 Cleuziou 2002: 228; Cleuziou 2007: 222; Cleuziou – Tosi 2007: 275; Gregoricka 2016: 214; Azzarà – De Rorre 2017: 14.
382 Crawford 1996; Crawford 1998: 121–123; Potts 2001: 44.
383 Carter 1997: 247.

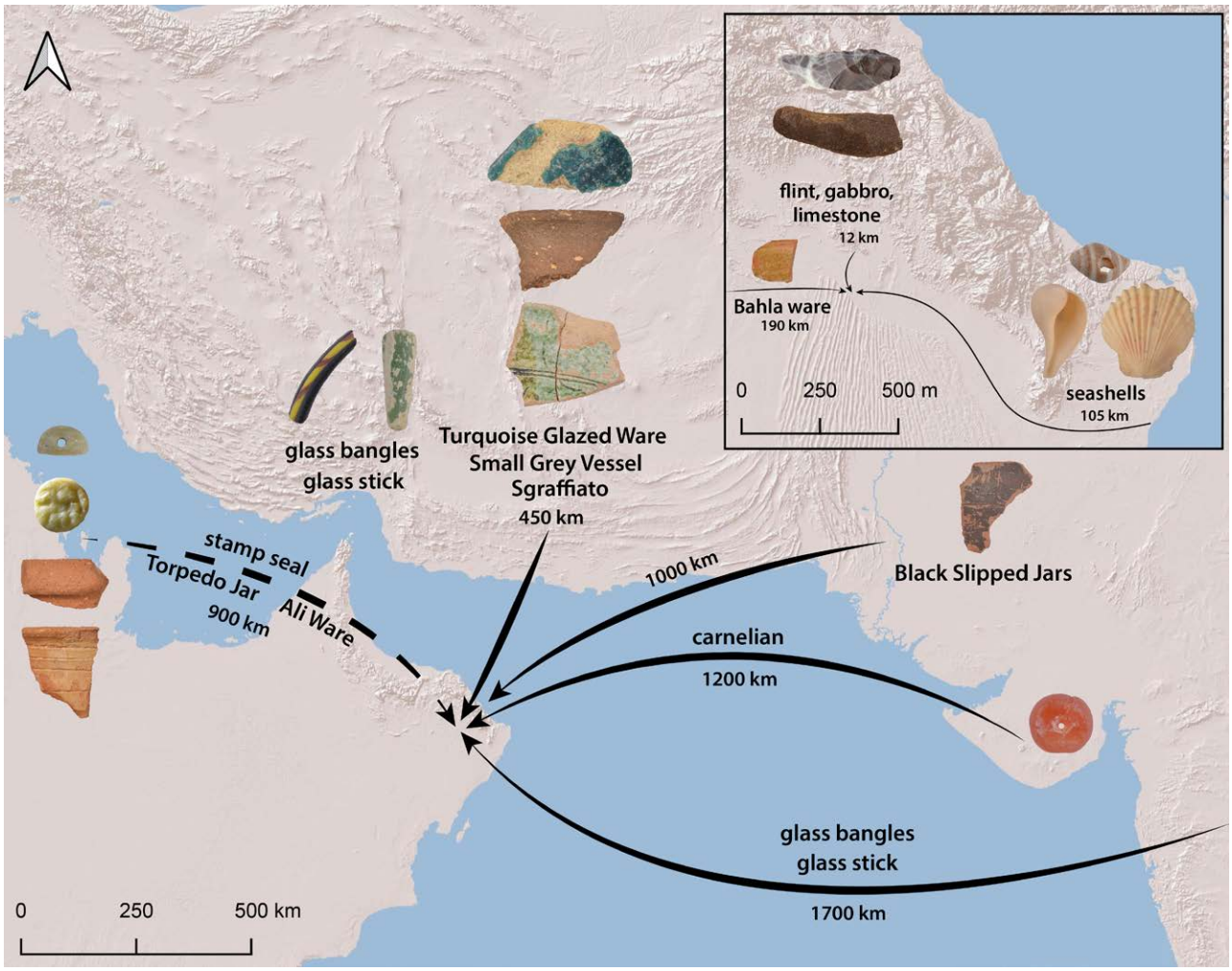

Fig. 100: Materials and objects imported to Tawi Said.

central Oman, would have been most affected by this, which fits well to that in the United Arab Emirates and the northern coastal areas of the Sultanate of Oman, more and larger sites are known. Carter[384] explains this concentration by the high ecological diversity and reliable subsurface water, making it possible to feed a largely settled population. However, more and more evidence appears for settlement sites from central Oman such as at Bat[385] and Maysar,[386] and there are also indicators for the continuous use and construction of monumental towers during that time.[387] Still, most of the archaeological evidence of this period derives from tombs.

Tawi Said has always featured as the first non-funerary Wadi Suq period site of central Oman. Carter.[388]lists it as a minor site without massive structures and considerable depth of deposits. This type of site is associated with temporary structures built of perishable materials such as barasti huts, difficult to detect in the archaeological record. As already assessed by de Cardi,[389] during the Wadi Suq period, it most likely represents a temporary campsite of mobile communities. Likely we are dealing with a seasonal migration between coast and inland as was typical for later Bedouin communities in the region (see below). At the coast, more substantial Wadi Suq period sites were found, for example at Ras al-Jinz RJ1.[390]

The distribution map of the finds indicates that Wadi Suq activities concentrate in the central part of the site. Here, nearly all pottery sherds that can be dated to the Wadi Suq period were found (Fig. 20). The find spots of the Wadi Suq period pottery overlap with that of the ground stone tools (chapter 7), most of the flint artefacts (chapter 3), the metal objects (section 9.1) as well as the crucible fragments (section 9.2). One soft-stone vessel

384 Carter 1997: 77–78.
385 Frifelt 1976: 60; Frifelt 1979: 584; Brunswig 1989: 36; Kerr 2016: 254.
386 Weisgerber 1981: 252 tab. 252; Vogt 1985: 225; Carter 1997: 72.
387 Cocca – Vinci – Armigliato 2016; Cocca *et al.* 2019; Döpper 2021a.
388 Carter 1997: 56.
389 De Cardi – Bell – Starling 1979: 86.
390 Monchablon *et al.* 2003.

fragments that can be dated to the Umm an-Nar period also come from this area (chapter 6). Thus, one can relate the use of these artefacts to the Wadi Suq period, bearing however in mind that Late Islamic material was found all over the survey area and thus also in the zone of the Wadi Suq period pottery. Nevertheless, the finds indicate that people in the Wadi Suq period practiced some form of small-scale copper processing including metal recycling (section 9.2). The various metal scraps and broken off pieces could have been smelted on site in an open crucible and shaped into plano-convex ingots for later use. Possibly, the ground stone tools were involved in this process. Generally, little is known on copper processing sites from the Wadi Suq period, the most thoroughly investigated one being Wadi al-Hilo in the United Arab Emirates.[391] Here, a long, continuous tradition of copper working from the Hafit period to the Iron Age is evident. Other than Tawi Said, copper processing was conducted at Wadi al-Hilo at a larger scale and in stone-built workshops. At least 50 to 200 metric tons of slag have been reported from the site, which is, however, still less than for example what is known from Maysar, but far exceeds the quantities from Tawi Said.[392]

The Dilmun-inspired stamp seal TWS18A-02783 (chapter 5) clearly demonstrated the interconnectivity of Tawi Said during the Wadi Suq period and the carnelian bead TWS18A-01967 (section 4.1.6) is likely also of a Wadi Suq period date. Thus, although the intensive trade along the Arab-Persian Gulf and the Gulf of Oman known from the third millennium BCE ceased, there was still contact with Dilmun/Bahrain and the region of modern-day India.[393]

The pottery allows the determination of a more fine-tuned chronology within the Wadi Suq period. As the shapes and decorations show numerous traits from the previous Umm an-Nar period, a date early in the Wadi Suq is most likely. Another chronological indicator are sherds of Indus Black Slipped Jars (section 2.4.1). Such storage jars are common import items from Eastern Arabia during the later part of the third millennium BCE until the collapse of the Indus Civilization around 1900 BCE. Fragments of such vessels have been found in almost all Umm an-Nar coastal settlements as well as at most of the inland sites.[394] Indus material was, however, also encountered at some Wadi Suq period sites.[395] In conclusion, it all hints towards an early date in the Wadi Suq period of the occupation at Tawi Said, likely around 1900 BCE.

391 Kutterer 2013b.
392 Kutterer 2013b: 82.
393 See also Carter 1997: 111–115.
394 Frenez 2018: 385–386; Bernardini *et al.* 2020: fig. 15.
395 Méry *et al.* 2017: 163.

Some things, however, contradict this evidence. These are the stamp seal TWS18A-03571, the two possible Late Bronze Age pottery sherds TWS18A-01778 and TWS18A-02430 as well as the Iron Age pottery (section 2.4.2). All similar objects to the seal come from Iron Age contexts (chapter 5).

11.3 Tawi Said in the Late Islamic period

In Late Islamic times, Tawi Said was located on the border between the area of the Hajrieen tribe, based at the Al-Mintarib oasis and that encompasses several Bedouin sub-tribes, and those of the Wahiba, a group of pastoral Bedouin tribes from the desert.[396] According to Scholz,[397] it is in an area that was traditionally used as living zone of the whole family during the summer months from June to September, where male family members were responsible for the animals. Here, permanent summer wells were available.[398] In summer, when the monsoon winds make this pursuit less attractive, families from the coast tend to migrate to the Wahiba settlements on the fringe of the Sharqiyah for the date harvest.[399] From this region, people moved to places in the Sharqiyah desert that provided water by wells such as Tawi al-Haryan for the winter.[400] Male members of the group also move to the coast for fishing.[401] This fits well with the ephemeral evidence of the site, indicating that it was – as in the Wadi Suq period – used as a seasonal campsite.[402] The Bedouins in Oman practised a mixed herding of sheep and goats as well as camels and performed an important task to supply the sedentary communities with animal products and transported agricultural products to the coast.[403] According to Thesiger,[404] members of the Wahiba tribe used small black goat's hair tents, but when living close to wadis, they built themselves shelters from tree trunks and branches. On the outskirts of market towns, date-palm fond (*arish*) constructions were also common.[405] Of those constructions, only little survives in the archaeological record.

Late Islamic material was distributed all over the survey area. There is, however, a special concentration of Late Islamic pottery in the north and east (Fig. 20). This is also where most of the seashells (chapter 8) and glass bangles (section 4.4) come from. The metal

396 Scholz 1977: 107 tab. 1.
397 Scholz 1977: 112 fig. 3.
398 Wilkinson 1987: 23.
399 Chatty 1996: 11–13; Richardson – Dorr 2003: 314.
400 Chatty 1996: 11–13.
401 Scholz 1977: 126.
402 For comparable contemporaneous sites discovered in the desert of Abu Dhabi see King – Hellyer 2003.
403 Scholz 1977: 113; Wilkinson 1987: 23.
404 Thesiger 1950: 149.
405 Richardson – Dorr 2003: 314.

needle TWS18A-00269 (section 9.1.1) was one of the few metal objects also found in the northern part of the survey area. Based on this distribution, one can assume that the seashells relate to the Late Islamic activities at the site, which included – as demonstrated in section 8.3 – the making of shell personal adornments. The seashells are also an indicator of the relationship of the people in Tawi Said to the coast, likely as part of their seasonal migration. Evidence for contacts to regions even further afield come from the glass bangles (section 4.4) and glass kohl stick (section 10.2). Additionally, there are pottery imports from Iran and possibly Bahrain.

The pottery gives further indications for a more precise chronology of the use of Tawi Said during the Late Islamic period (section 2.4.5). The presence of the comb-incised ware 70 as well as the potential Torpedo Jar and Ali Ware sherds from Bahrain suggests a date at the end of the 19th/beginning of the 20th century CE. Interestingly, none of the imports typical for 20th century assemblages such as Japanese, Chinese and European coffee cups[406] were found at Tawi Said. There is also one Persian Fritware sherd that dates to the 18th century CE as well as limited evidence for an Early and Middle Islamic occupation.

406 Grey 2011: 355.

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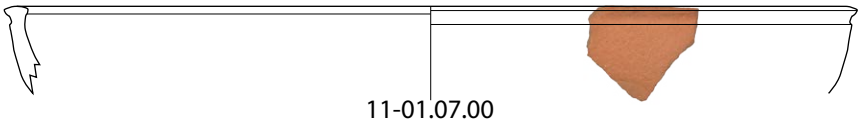

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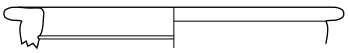

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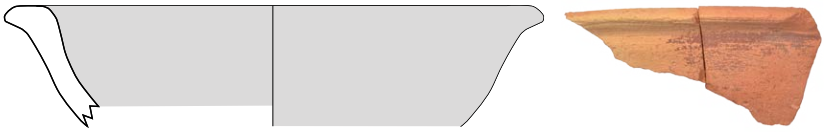

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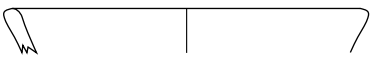

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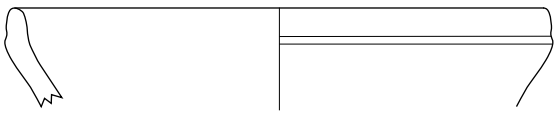

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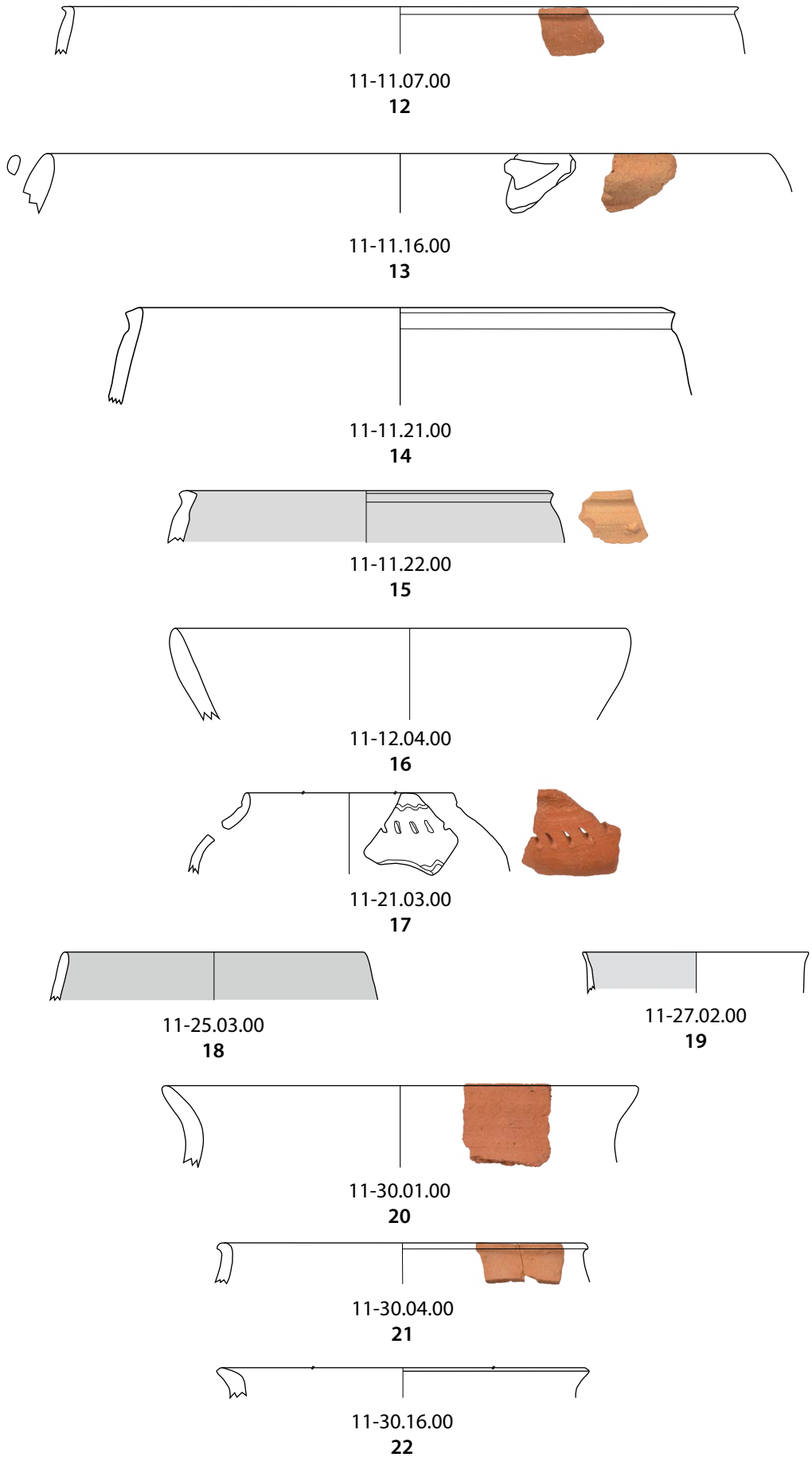
Flask and bases of ware 10
Flat bowls of ware 11

Scale 1:2



Deep bowls, cups, beakers and flasks of ware 11 Scale 1:2

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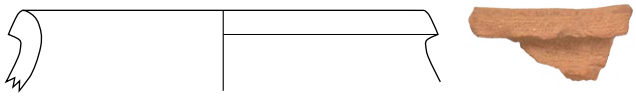

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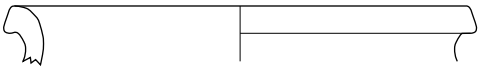

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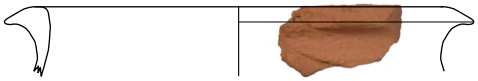

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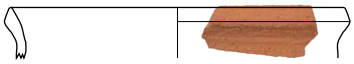

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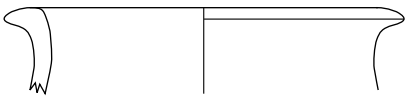

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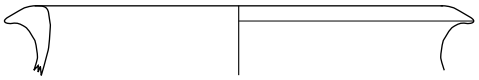

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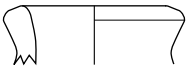

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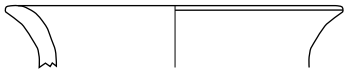

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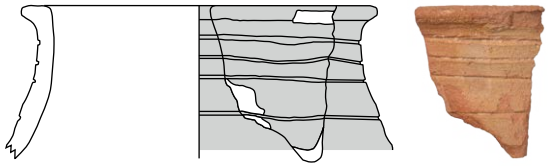

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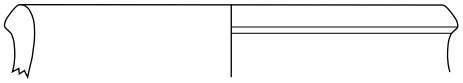

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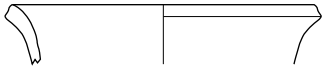

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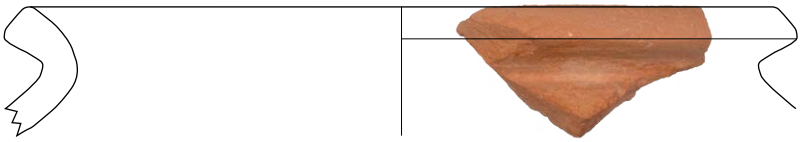

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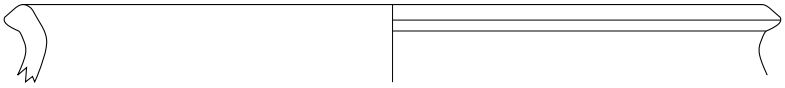

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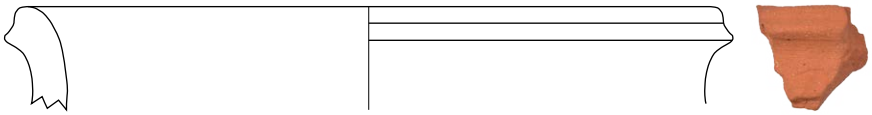

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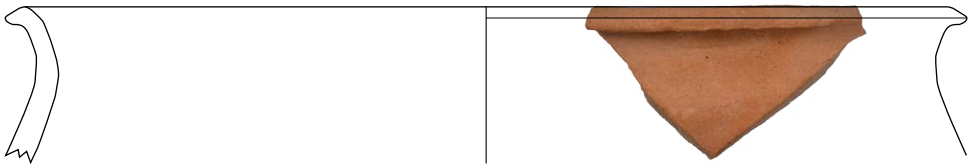

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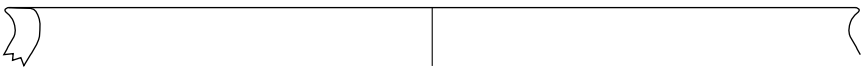

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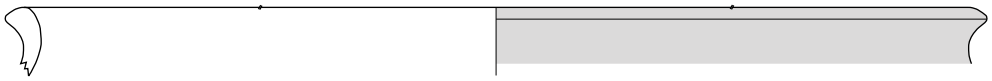

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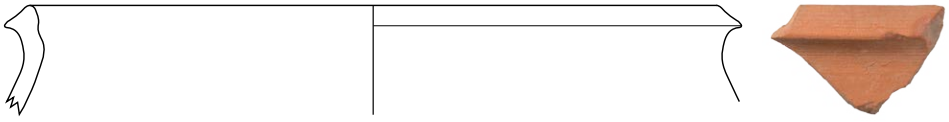

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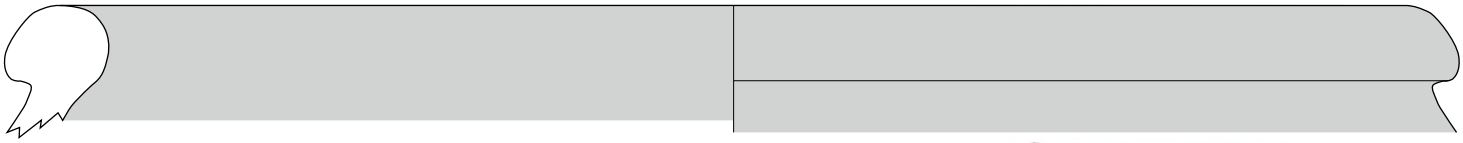

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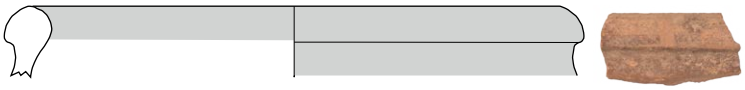

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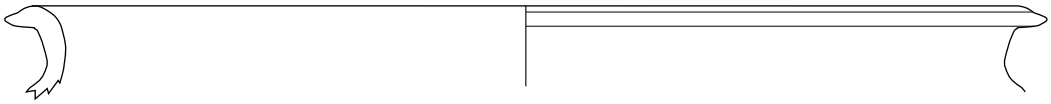

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11-40.60.00
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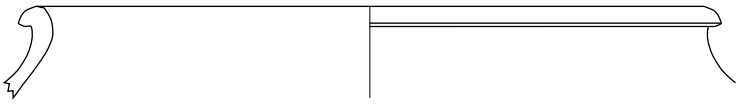

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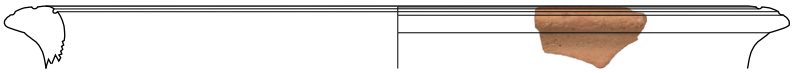

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11-0
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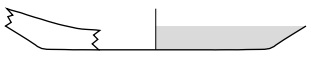

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56

11-/
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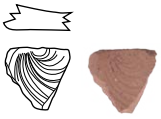

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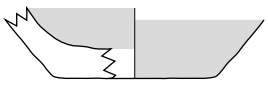

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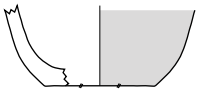

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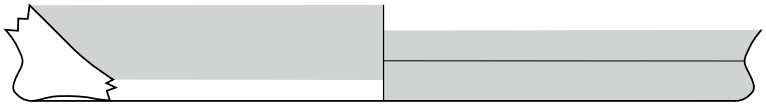
60

11-/
61

Jars and bases of ware 11

Scale 1:2



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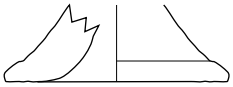

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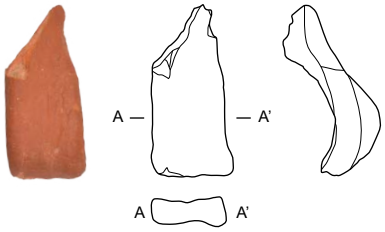

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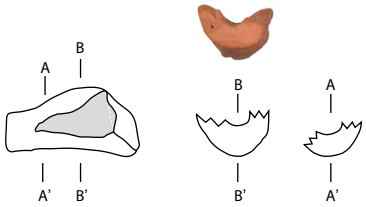
68



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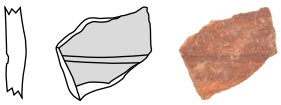

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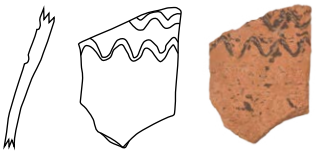

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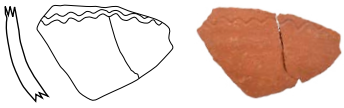

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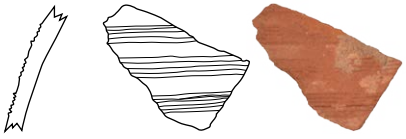
72



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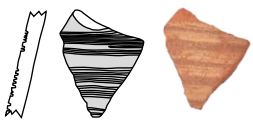
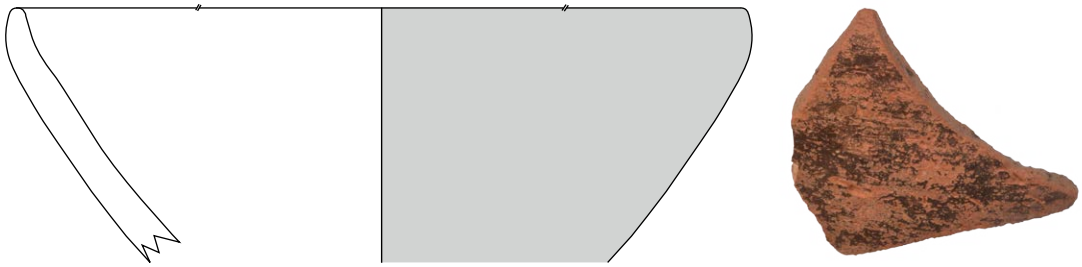
73



11-/
74

Bases, handles, spouts and decorated body sherds of ware 11 Scale 1:2

13-02.01.00
75



13-02.09.00
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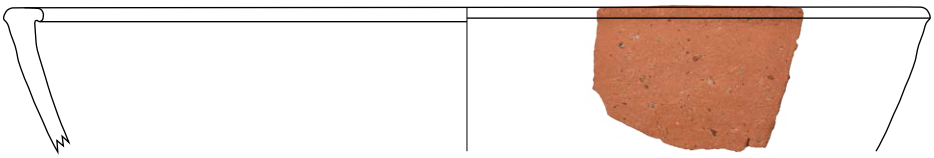

13-11.04.00
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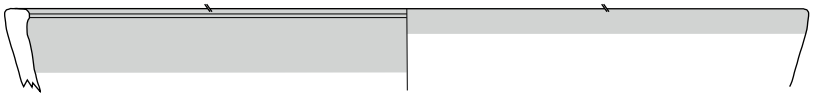
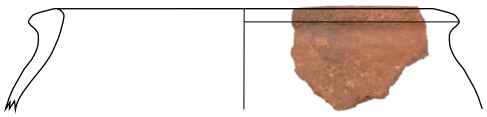


13-11.04.00
78

13-21.02.00
79



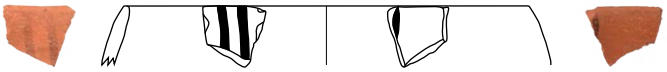
13-21.06.00
80

13-25.03.00
81

13-25.03.00
82

13-25.03.00
83

Shallow bowls, cups and beakers of ware 13 Scale 1:2



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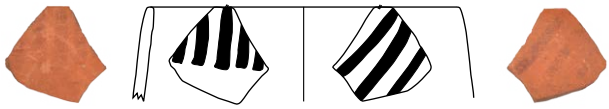
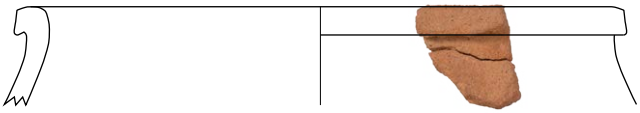
84



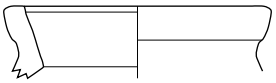
13-25.03.00
85

13-25.03.00
86



13-26.05.00
87

13-30.39.00
88



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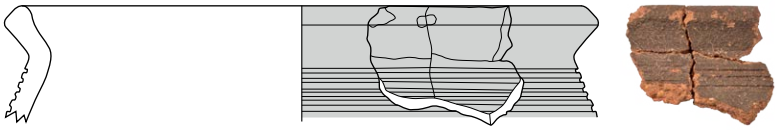
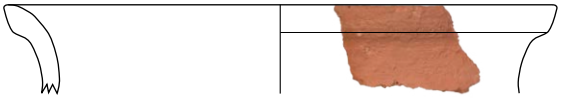


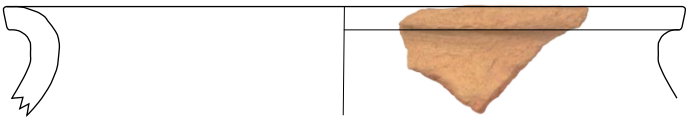
13-30.43.00
90

13-31.18.00
91

13-31.19.00
92

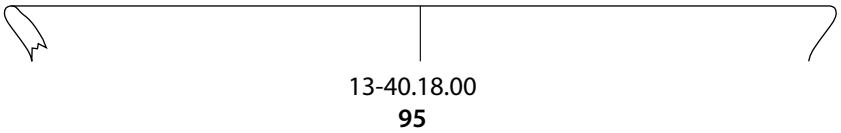


13-31.33.00
93



13-40.02.00
94

Beakers, flasks and jars of ware 13 Scale 1:2



13-40.18.00
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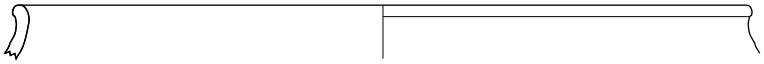

13-40.29.00
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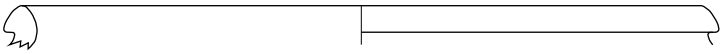

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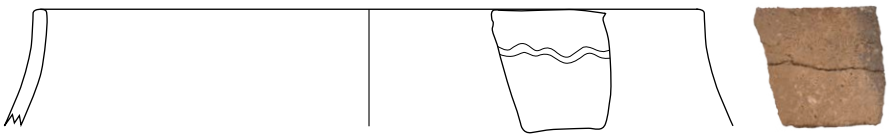

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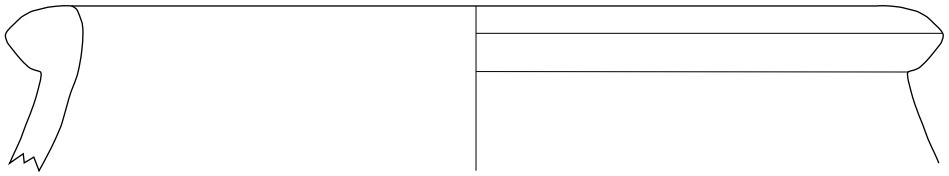

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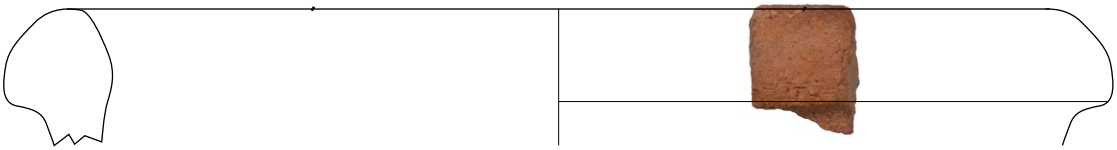

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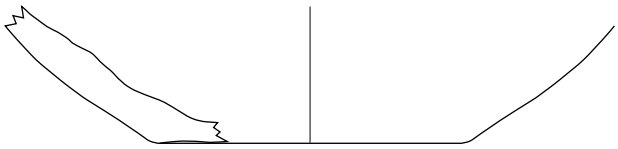

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101

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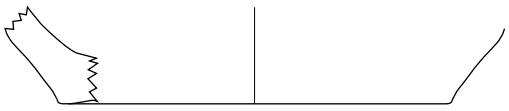
102

13-0
103



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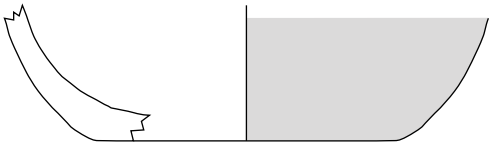
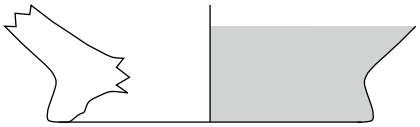


13-0
105

13-0
106

Jars and bases of ware 13 Scale 1:2



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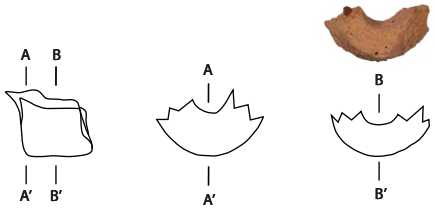
107

13-0
108



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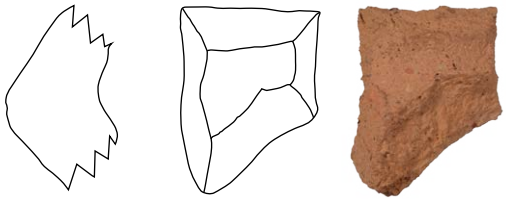

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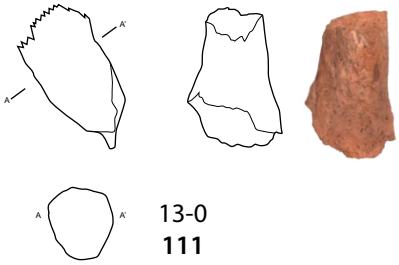

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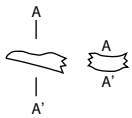

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112

13-/
113

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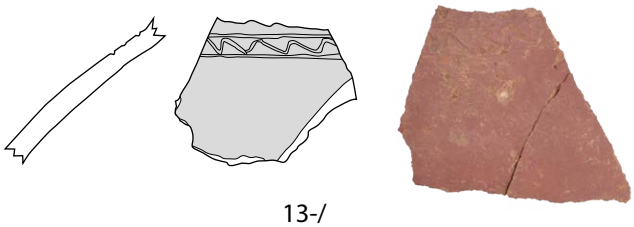
114



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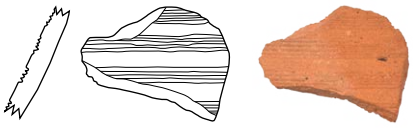
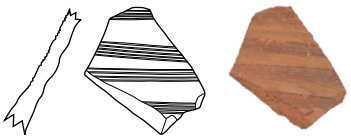
115



13-/
116



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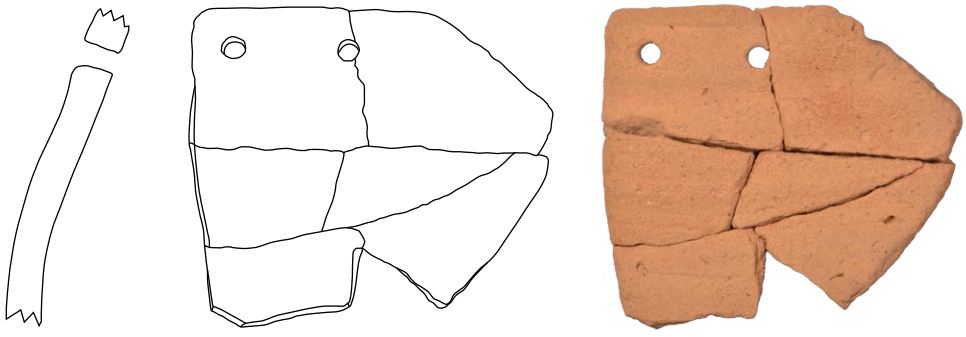
117



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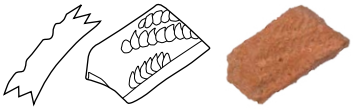
118

Bases, spouts, handles and decorated body sherds of ware 13 Scale 1:2



14-/
119

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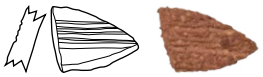
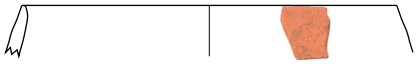
120

14-/
121



14-/
122

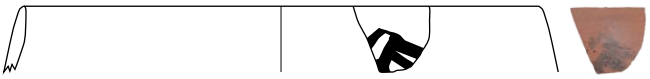
20-02.09.00
123



20-25.03.00
124

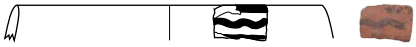
20-25.03.00
125

20-25.03.00
126



20-25.03.00
127

20-25.03.00
128



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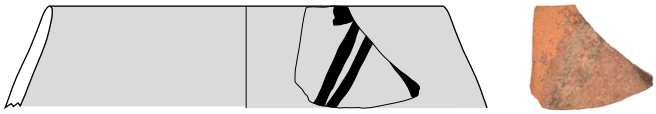
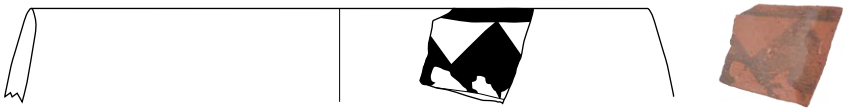


20-25.03.00
130



20-25.03.00
131

20-25.03.00
132

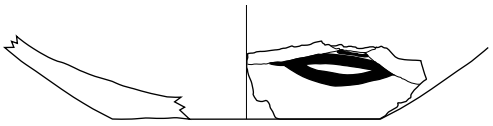
20-25.03.00
133

20-27.02.00
134

Decorated body sherds of ware 14
Bowls, cups and beakers of ware 20

Scale 1:2

20-31.30.00
135



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136

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138

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141

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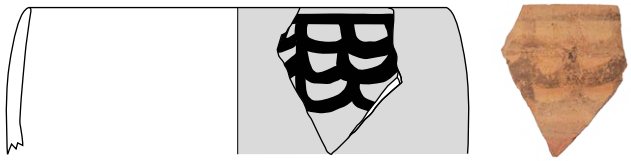
144

21-25.03.00
145

21-25.03.00
146

21-25.03.00
147



21-25.03.00
148

21-25.03.00
149

Flasks, bases and decorated body sherds of ware 20
Beakers of ware 21

Scale 1:2

21-25.03.00
150

21-/
151

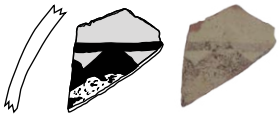
21-/
152

21-/
153

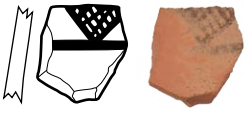
21-/
154

21-/
155

21-/
156



21-/
157



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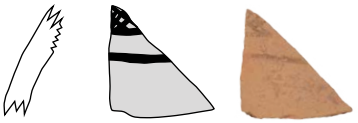
158



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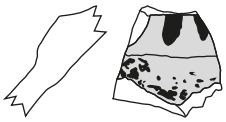
159



21-/
160

22-/
161

24-/
162

25-02.11.00
163

Beaker and decorated body sherds of ware 21
Decorated body sherds of ware 22
Decorated body sherds of ware 24
Shallow bowl of ware 25

Scale 1:2

25-0
164

25-/
165

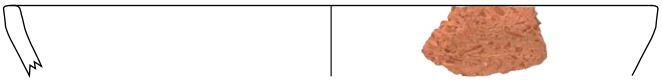
25-/
166

25-/
167

25-/
168

25-/
169

30-01.01.00
170



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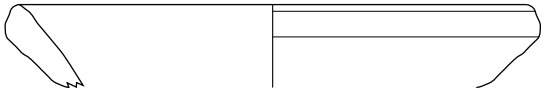
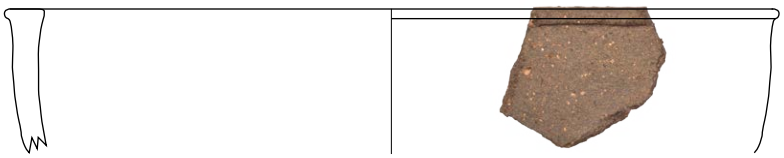
171



30-01.03.00
172



30-01.08.00
173

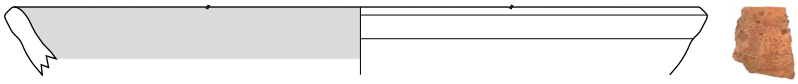
30-01.12.00
174

Bases and decorated body sherds of ware 25
Shallow bowls of ware 30

Scale 1:2

30-01.12.00
175

30-01.15.00
176



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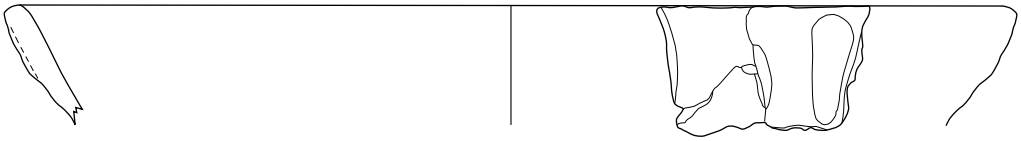
177



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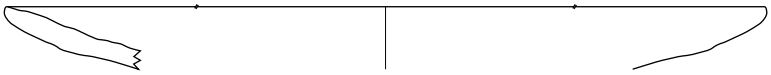
178



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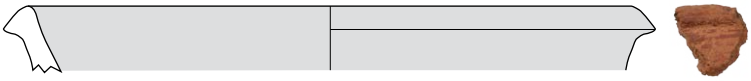
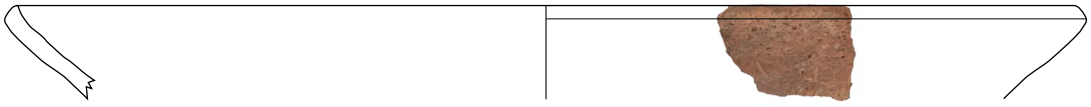
179

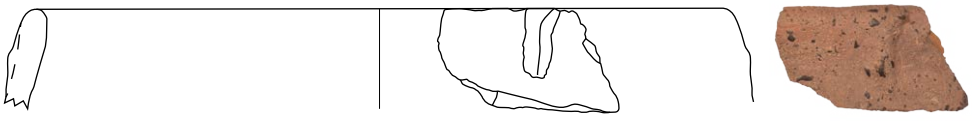


30-02.06.00
180

30-02.07.00
181

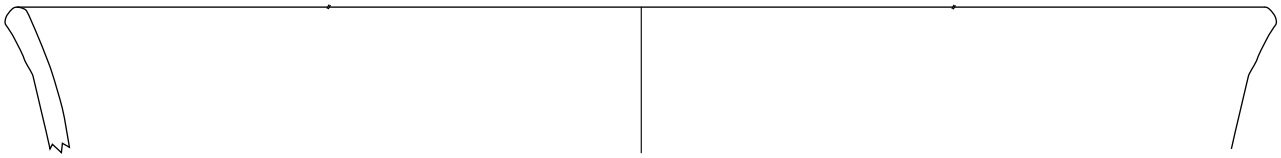


30-02.12.00
182

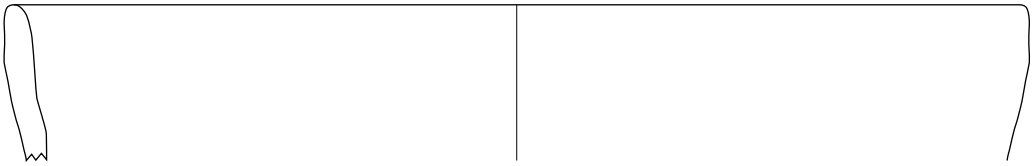


30-11.06.00
183

Shallow and deep bowls of ware 30 Scale 1:2



30-11.11.00
184



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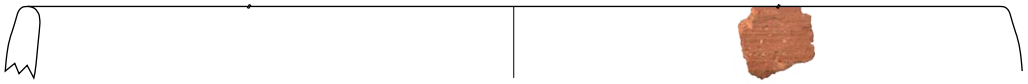
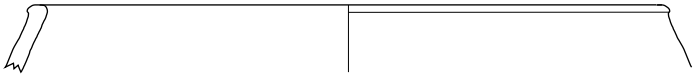


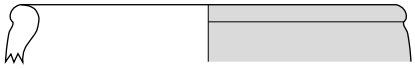
30-11.16.00
186



30-11.23.00
187

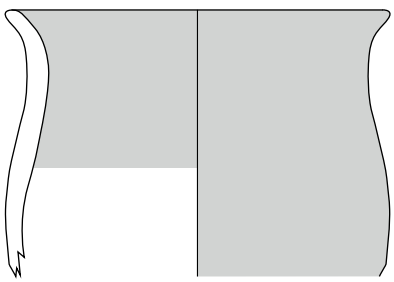
30-12.02.00
188

30-12.06.00
189

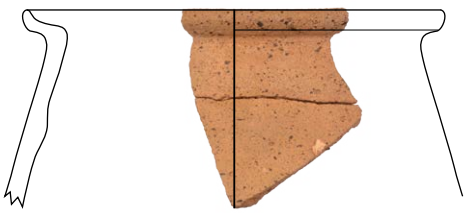


30-21.08.00
190

30-25.03.00
191



30-25.04.00
192



30-26.06.00
193

Deep bowls, cups and beakers of ware 30

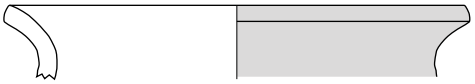
Scale 1:2

30-30.01.00
194

30-30.01.00
195

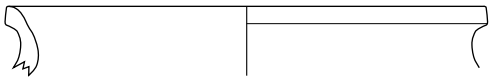
30-30.01.00
196

30-30.01.00
197

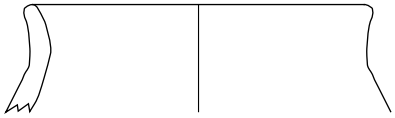


30-30.06.00
198

30-30.13.00
199

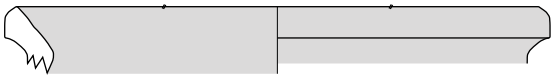


30-30.17.00
200



30-30.24.00
201

30-30.25.00
202



30-30.27.00
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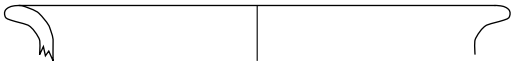

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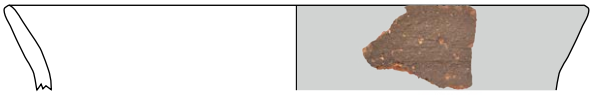
30-30.37.00
205



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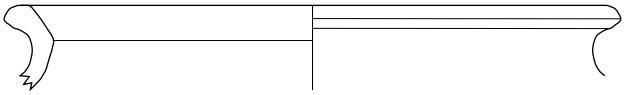

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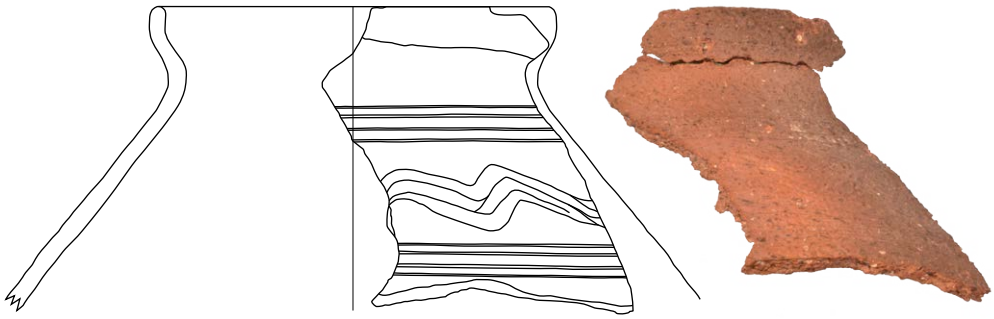
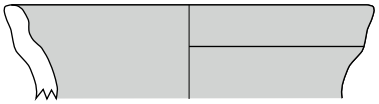
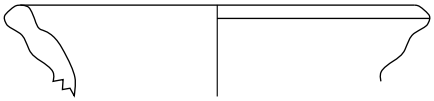


30-30.44.00
208

30-30.47.00
209



30-31.02.00
210



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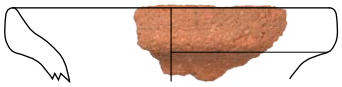
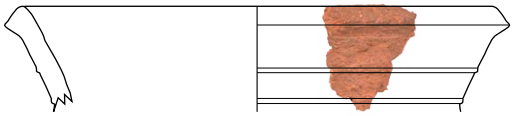


30-31.03.00
212

30-31.08.00
213

30-31.10.00
214

30-31.12.00
215



30-31.15.00
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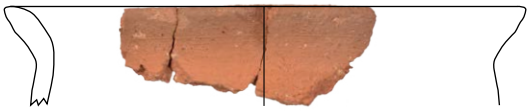
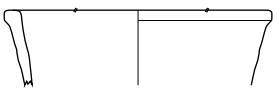


30-31.19.00
217

30-31.21.00
218

30-31.24.00
219

30-31.30.00
220



30-31.31.00
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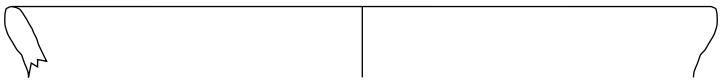


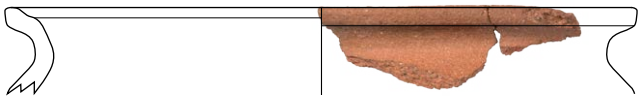
30-40.15.00
222

30-40.19.00
223

30-40.22.00
224

30-40.32.00
225

30-40.33.00
226



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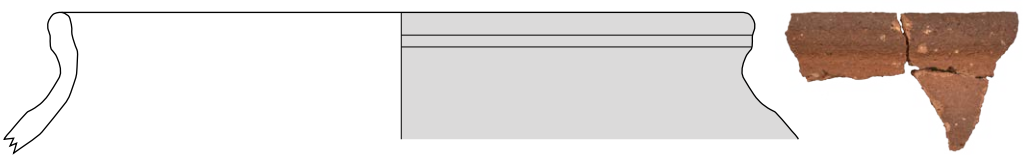
227

30-40.45.00
228

30-40.60.00
229



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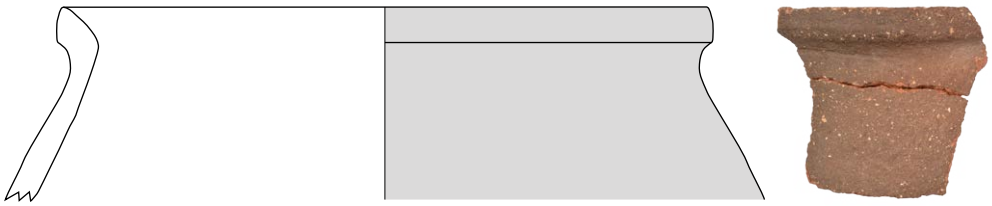
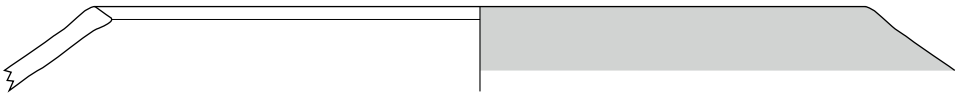
230



30-40.66.00
231



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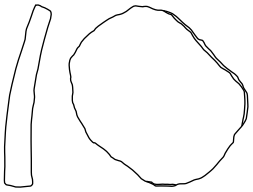
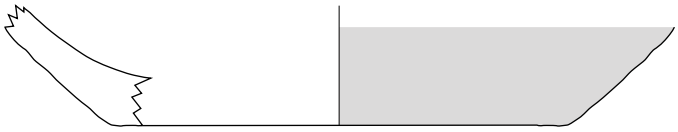
232



30-90.01.00
233

30-0
234

30-0
235



30-0
236

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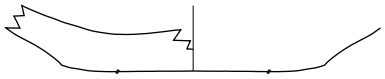
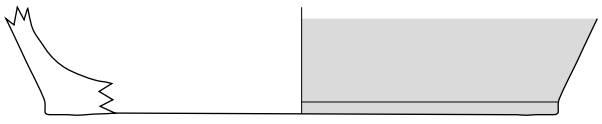
237



30-0
238

30-0
239

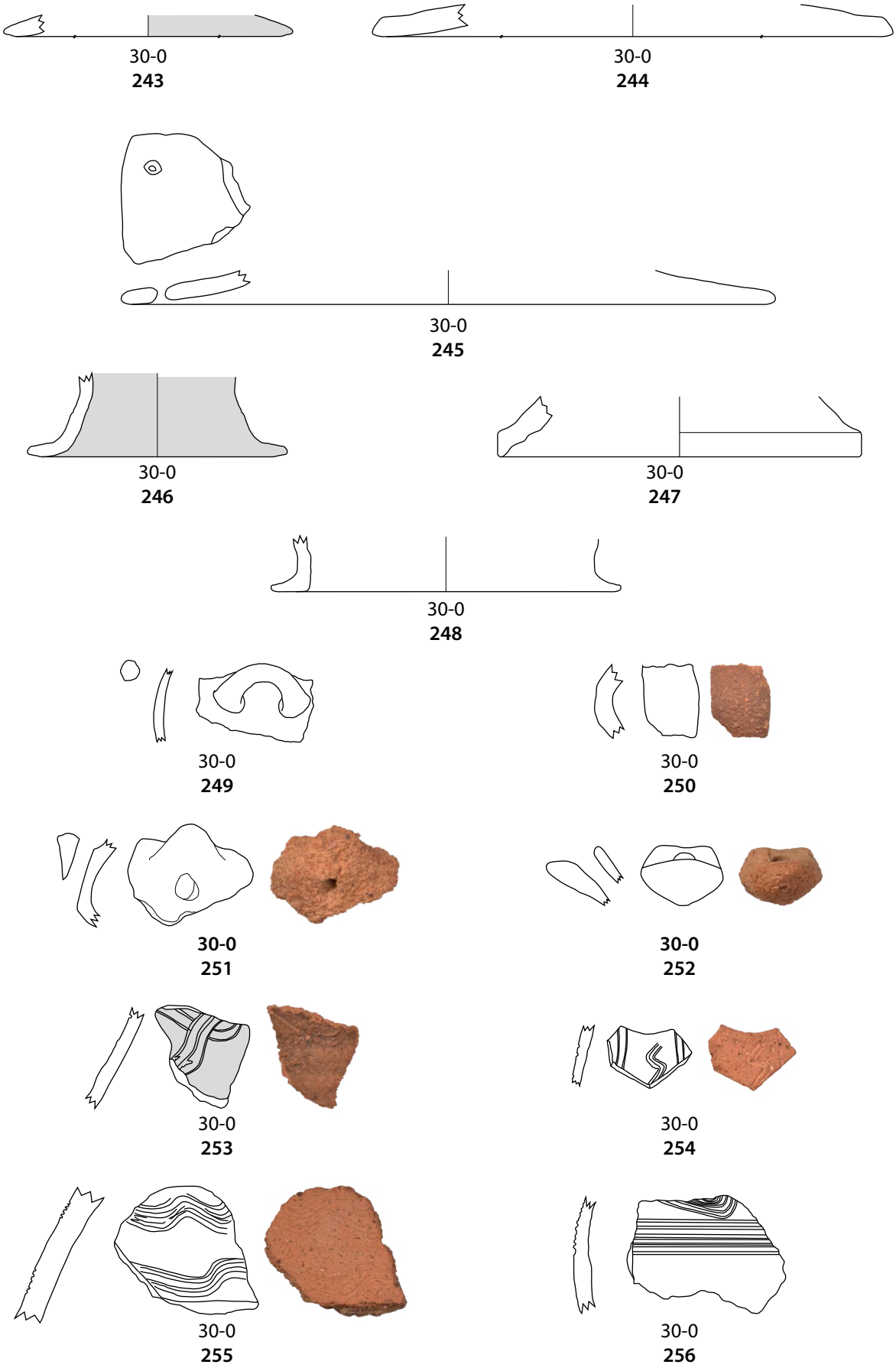


30-0
240

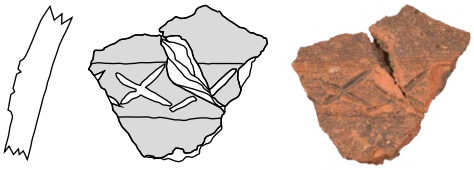
30-0
241

30-0
242

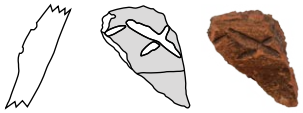
Bases of ware 30 Scale 1:2



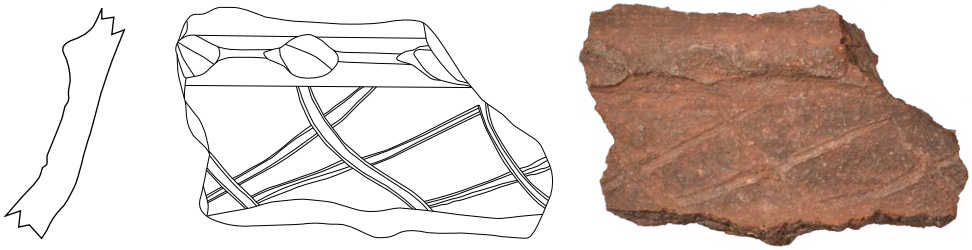
Bases, spouts, handles and decorated body sherds of ware 30 Scale 1:2



30-0
257

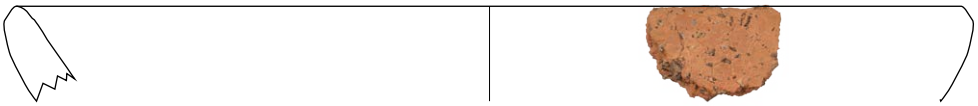


30-0
258

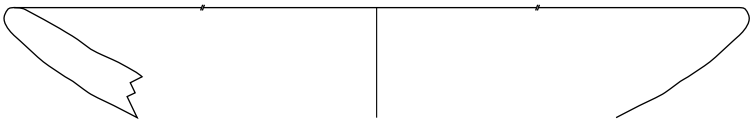


30-0
259

30-0
260



31-01.02.00
261



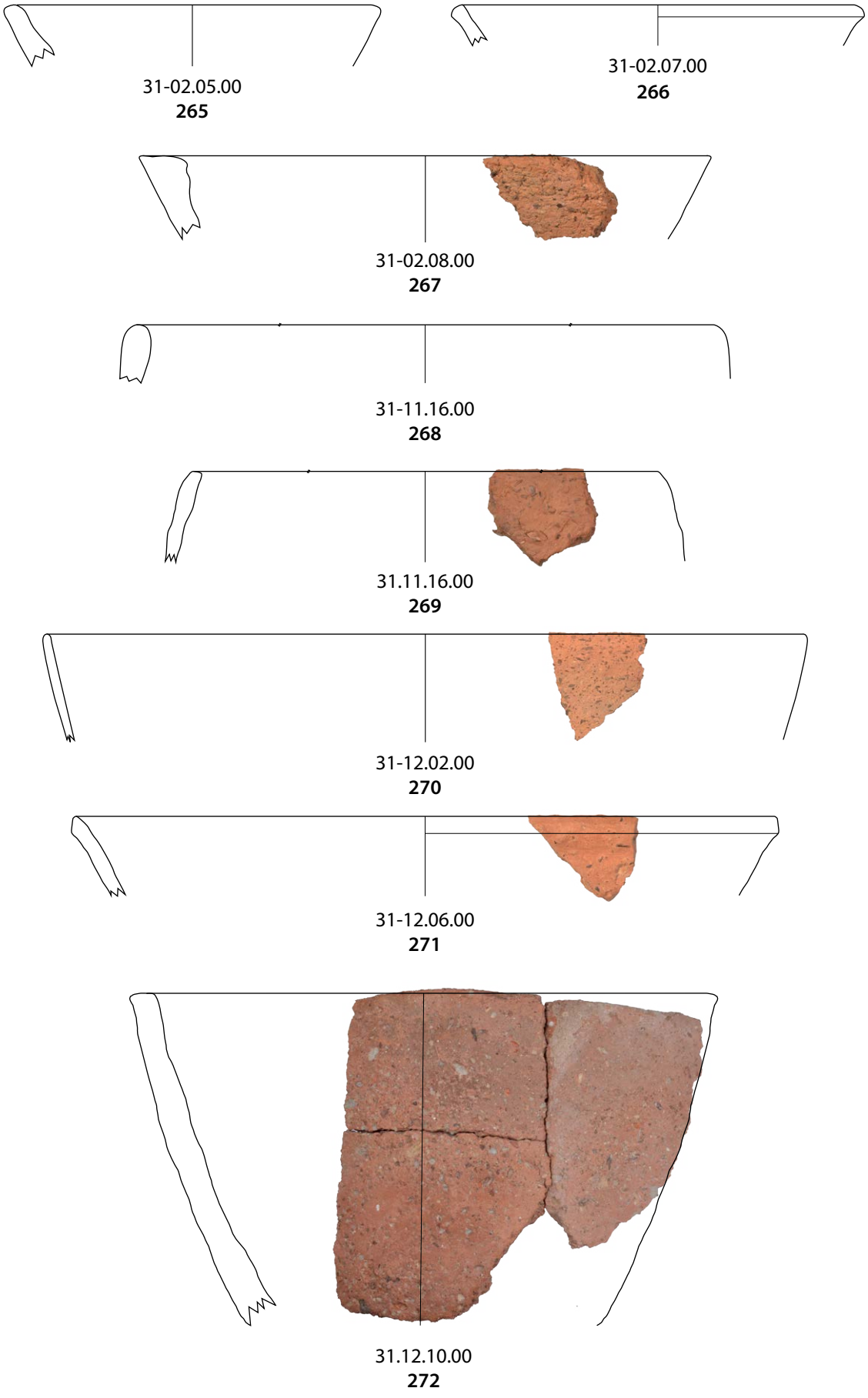
31-01.14.00
262

31-01.15.00
263

31-02.04.00
264

Decorated body sherds of ware 30
Shallow bowls of ware 31

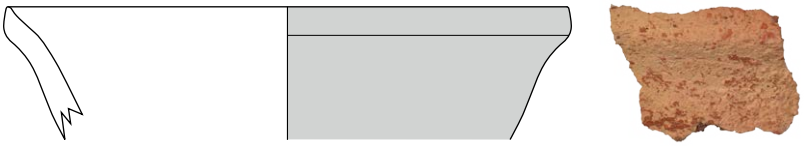
Scale 1:2



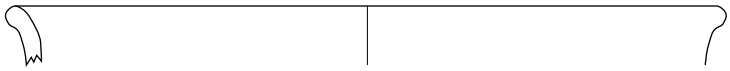
Shallow bowls, deep bowls and flasks of ware 31 Scale 1:2

31-30.44.00
273

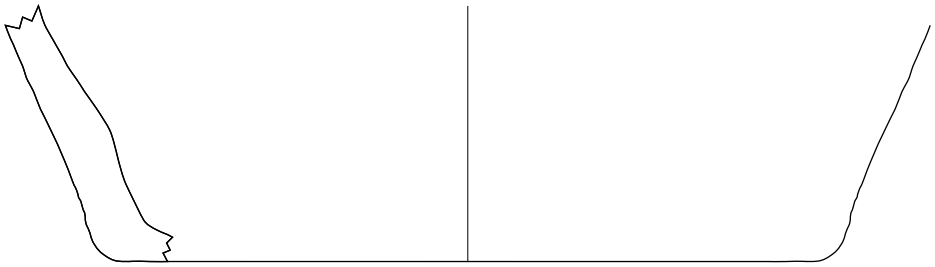
31-30.47.00
274



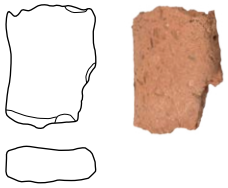
31-31.03.00
275



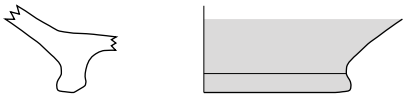
31-40.32.00
276



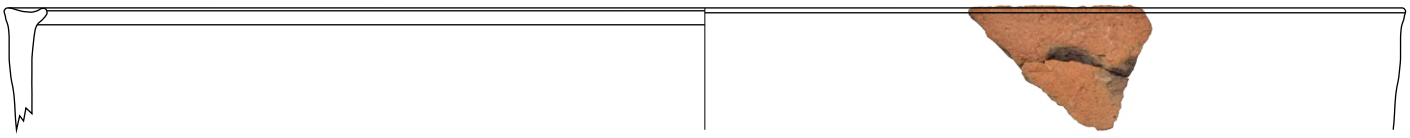
31-0
277



31-0
278



40-0
279



41-11.19.00
280

54-21.07.00
281

Flasks, jars, bases and handles of ware 31
Base of ware 40
Deep bowl of ware 41
Cup of ware 54

Scale 1:2

54-/
282

54-/
283

55-/
284

61-02.05.00
285

61-11.14.00
286

65-12.09.00
287

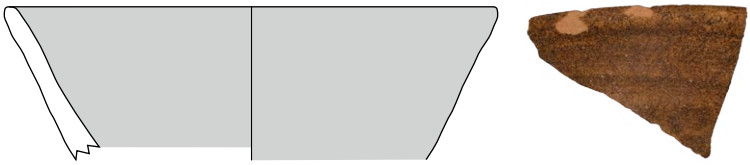
62-01.01.00
288

62-01.14.00
289

Decorated body sherds of ware 54
Decorated body sherds of ware 55
Shallow and deep bowls of ware 61
Shallow bowls of ware 62

Scale 1:2

62-02.01.00
290



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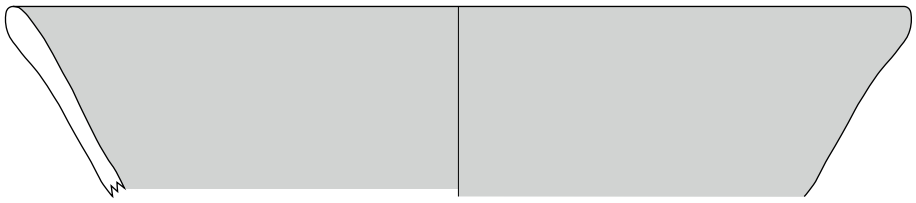
62-02.05.00
292



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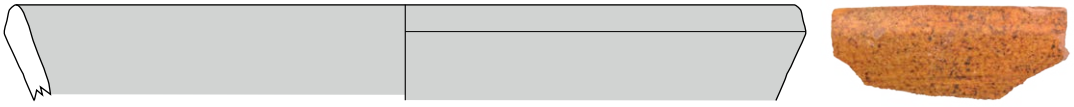
293

62-11.14.00
294

62-11.14.00
295

62-12.02.00
296



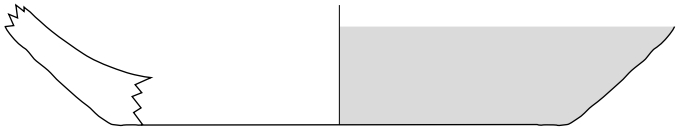
62-12.06.00
297

62-25.03.00
298

Shallow bowls, deep bowls and cups of ware 62 Scale 1:2

62-31.09.00
299

62-31.12.00
300



62-0
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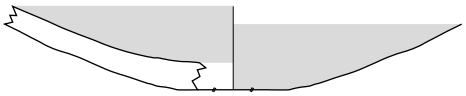

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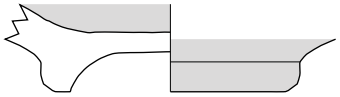
302

62-0
303



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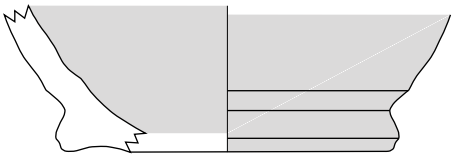
304

62-0
305



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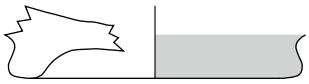

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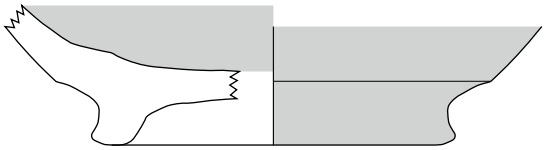

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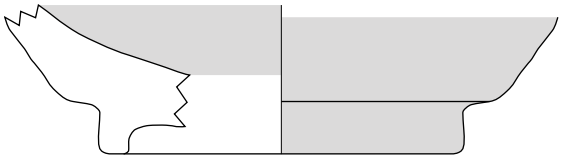

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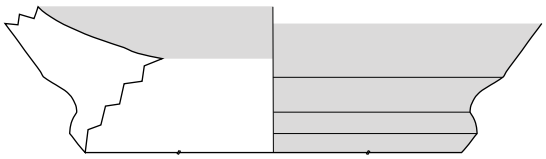


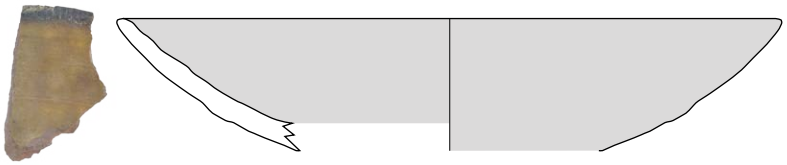
62-0
310

62-0
311

63-01.03.00
312

Bases of ware 62
Shallow bowls of ware 63

Scale 1:2



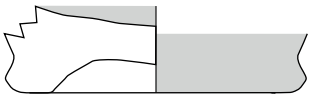
63-01.15.00
313

63-02.05.00
314

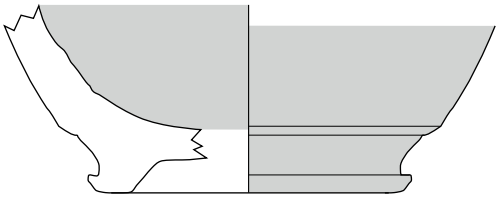
63-02.10.00
315

63-12.05.00
316

63-30.38.00
317



63-0
318



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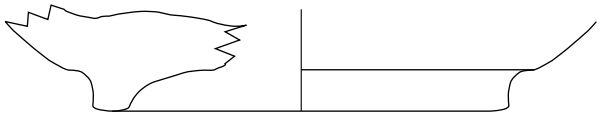

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63-0
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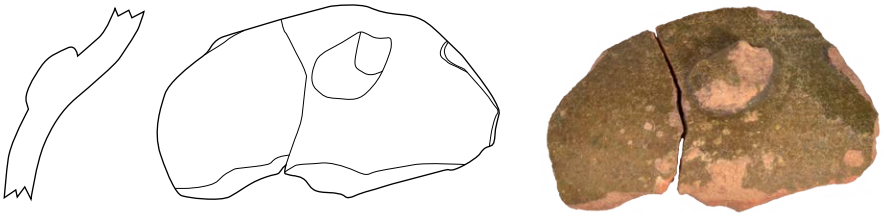
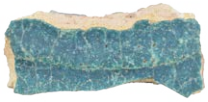


63-0
322

Deep bowls, flasks, bases and handles of ware 63 Scale 1:2

64-70.02.00
323

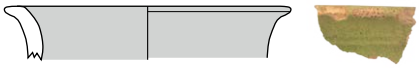


64-/
324

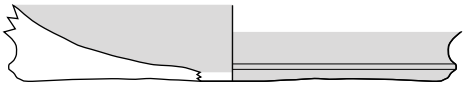
65-01.15.00
325

65-02.05.00
326

65-02.05.00
327



65-30.32.00
328



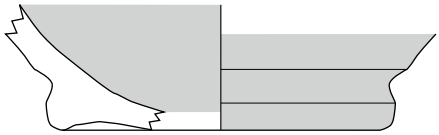
65-0
329

65-0
330

65-0
331

Large vessels and body sherds of wre 64
Shallow bowls, flasks and bases of ware 65

Scale 1:2



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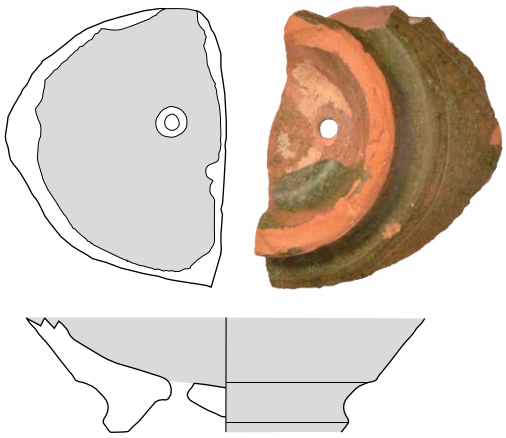
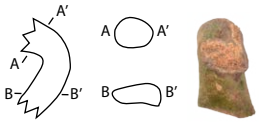
332

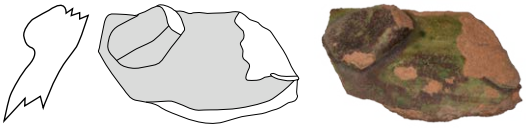


65-0
333

65-0
334

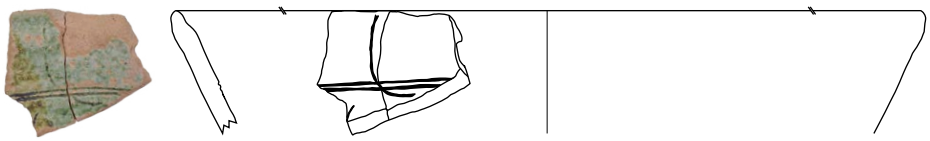


65-0
335



65-0
336

66-/
337



67-02.05.00
338

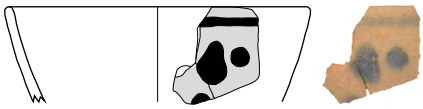
Bases and handles of ware 63
Body sherd of ware 66
Shallow bowl of ware 67

Scale 1:2

67-0
339

67-0
340

68-21.20.00
341



68-21.10.00
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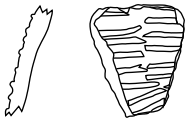
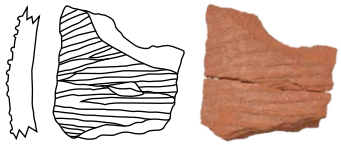


70-/
343

70-/
344



70-/
345

Bases of ware 67
Shallow bowls of ware 68
Decorated body sherds of ware 70

Scale 1:2

This book outlines the results of the 2018 archaeological survey at Tawi Said, located on the edge of the Sharqiyah desert in the Sultanate of Oman. The surveyed area of 150 x 125 m yielded close to 8,600 artifacts, with pottery sherds comprising the majority of the finds. Additional discoveries include shells, lithic tools, copper production waste, jewellery and fragments of soft-stone vessels. Of particular interest are two stamp seals, one of which bears a resemblance to the seals of Dilmun style. Two significant phases are attested by the finds from Tawi Said: the Wadi Suq period (2000-1600 BCE) and the Late Islamic period (1650-1970 CE). Together with other discoveries, the Dilmun-inspired stamp seal illustrates the interconnectedness of Tawi Said in interregional exchange during the Wadi Suq period. The connectivity of the Late Islamic period is similarly evidenced by imported pottery, glass bangles and other artefacts. The absence of architectural remains suggests that Tawi Said was a temporary place used by mobile groups throughout its existence.

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