# ROMAN TO ISLAMIC BEADS AND PENDANTS FROM MATMAR AND MOSTAGEDDA, MIDDLE EGYPT

**Joanna Then-Obłuska and Alexandra D. Pleşa**

*Between 1927 and 1931, British archaeologists Guy Brunton and his wife Winifred recorded over 150 graves assumed to date from Late Dynastic to early Islamic times in the cemeteries of Matmar and Mostagedda, Middle Egypt. Sixty-four bead objects found in funerary context are now located in six museum collections. Recent studies of material found in these tombs and the radiocarbon dating of textile samples allowed for a revision of Brunton's initial chronology and an overview of the typology of the bead corpus based on the revised chronological framework. The analysis of the Matmar and Mostagedda corpus also opens the avenue for a study of the timeline, typology, use, and provenience of beads at sites in the Middle Egyptian Nile Valley during the Roman to early Islamic period.*

## INTRODUCTION

As in previous periods, beads are by far the most common class of artifacts placed in burials of the Roman to early Islamic periods in Egypt. Despite the ubiquity in the archaeological record and the potential for addressing a variety of topics of economic and socio-cultural history, knowledge about the production timeline, typology, use, and provenience of bead items of this period is in its infancy. In addition, there is a stark imbalance in the publication of material coming from Egypt's various regions. For instance, the typology, chronology, and provenience of beads coming from sites on the Red Sea is better known than that of counterparts in Middle Egypt. We address the current imbalance by overviewing a corpus of 64 Roman to early Islamic bead-and-pendant objects from Matmar and Mostagedda, two neighboring villages in Middle Egypt (Figure 1), which is largely unpublished and little known to specialists.

In 1927, British Egyptologists Guy Brunton and wife Winifred decided to start self-funded excavations on the outskirts of modern Matmar and Mostagedda in search of prehistoric remains. During five campaigns between 1927 and 1931, they cleared two strips of desert approximately 5.5 km long at each village, and discovered that the entire area had been almost uninterruptedly used for cultic, funerary, or habitation purposes from the Badarian to the early Islamic periods, after which it appears to have been largely abandoned.

Also scattered throughout the desert were necropolises which Brunton dated from the "Ptolemaic" to "early Arab" periods. Brunton likely excavated some hundreds of graves there, but only recorded 34 "Late and Ptolemaic" tombs at Mostagedda and 120 tombs of the "Roman and Coptic" periods (62 at Matmar and 55 at Mostagedda). The "Roman and Coptic" burials at Mostagedda "were scattered about in most of the areas north of the headland, especially in [area] 1400." Areas 300, 400, 500, 800, 900, and 1100 contained mostly burials datable to "early Roman" times, but also two "Coptic" graves (Figure 1, a). The necropolises in areas 1400, 1800, 1900, 10100, and 11700 were dated to "Coptic" times but included three "early Arab" graves as well. At Matmar, graves of the "Roman and Coptic" periods were mainly found in areas 600, 800, 900, 1000, and 1100, and to a lesser extent in areas 1300 and 3200 (Figure 1, b) (Brunton 1937:136-142, 1948:91-94). The location of these tombs is only vaguely provided. Brunton labelled excavation areas with round numbers in the order of hundreds or thousands, and tombs received unique numbers within the area number, but the precise location was only recorded for a fraction of the tombs.[1]

For her doctoral dissertation, Alexandra D. Pleşa (2020) had the opportunity to document the burial inventories of Brunton's "Ptolemaic to early Arab" graves, including a detailed record and photographs of the bead objects presented in this study. The large discrepancies between Brunton's original dating and the typology of museum material required a revision of the chronology of individual graves as well as the general timeline of the necropolises. The comparative analysis of the surviving museum material, Brunton archive, published records, and radiocarbon dates of 20 textile samples[2] indicated that most "Roman," "Coptic,"

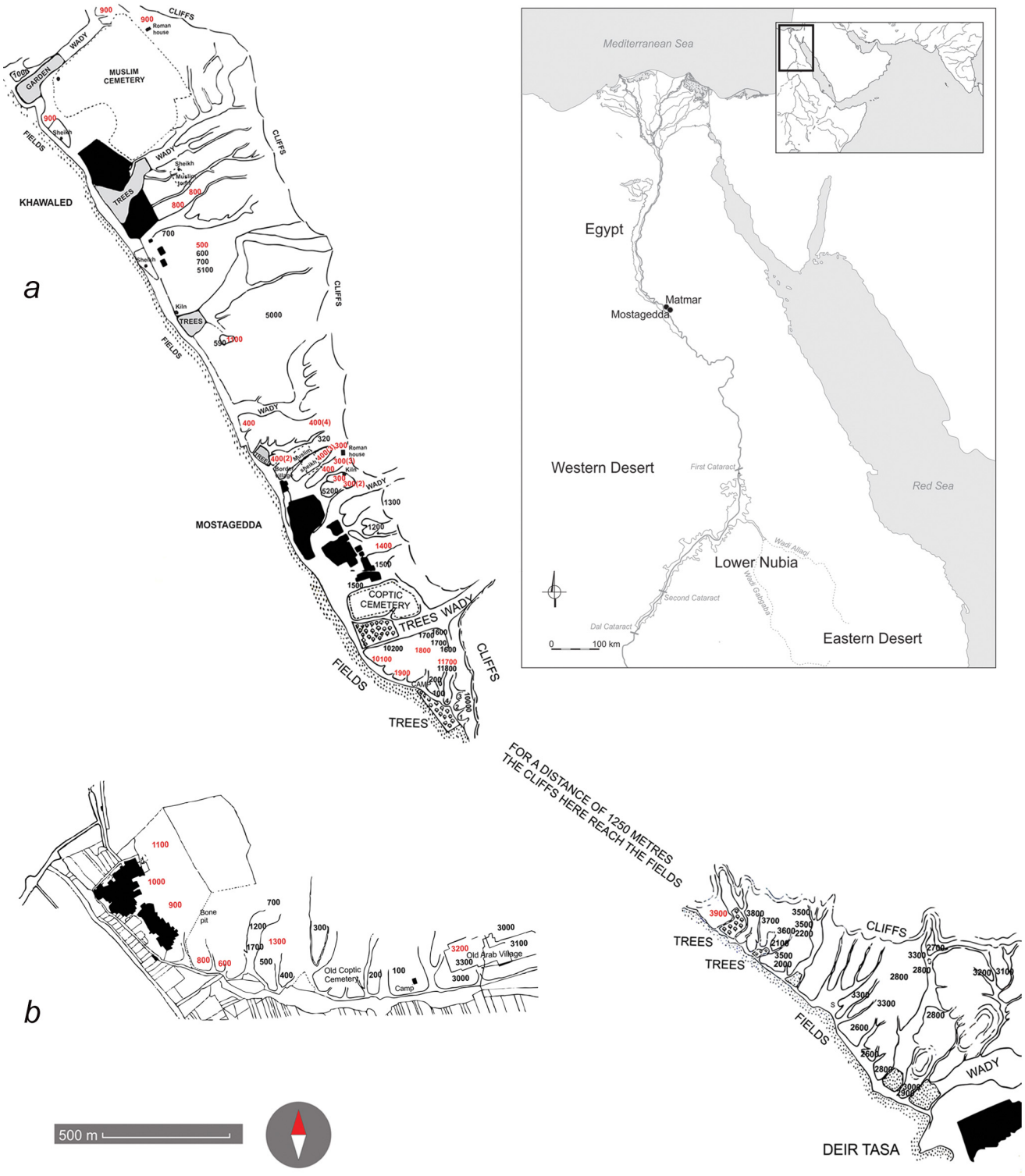



**Figure 1.** Locations of cemetery excavations at Matmar and Mostagedda (areas with Ptolemaic to early Islamic graves are marked in red): a, excavations north and south of Mostagedda (adapted from Brunton 1937); b, excavations east of Matmar (adapted from Brunton 1948) (drawing: Szymon Maślak and Alexandra D. Pleşa).

and "early Arab" graves at the two sites were made sometime between the 4th and 8th, possibly early 9th, centuries. The timeline of the funerary activities at the two sites, however, was considerably different. The bulk of burials at Matmar were made during the 5th-6th centuries, whereas those at Mostagedda date to the 7th-8th centuries (Pleşa 2017a, 2020). Unfortunately, the insufficient recording and lack of museum material did not allow for a similar revision of the "Late Dynastic to Ptolemaic" graves at Mostagedda, though there are serious reasons to doubt the initial dating. Three textiles that came from unknown burials in area 3900 were initially dated to "Ptolemaic" times, but yielded radiocarbon dates of the early Islamic and Mamluk periods, suggesting not only that Brunton's dating for these graves is flawed, but that the area was in use during early Islamic and Mamluk times as well (Pleşa 2017a, 2020).

Brunton recorded several hundred jewelry items in the Ptolemaic to early Arab graves or on the surface, but shipped only a fraction of them to museums. In this study, we analyze a corpus of 64 bead items coming from these graves. The material is located in six museum collections,[3] and comprises necklaces, earrings, and individual beads. It comes primarily from child and female graves (11 tombs at Mostagedda and 33 at Matmar)[4] but also includes two items without a clear provenience (nos. 63, 64). The latter come from area 800 at Matmar, where they were either taken from plundered unregistered graves or from the surface (Brunton 1948:101, "Beads [two] Res.").

## THE COLLECTION

We present the bead types encountered in the corpus and place them in the revised dating.[5] The overview of beads and pendants is structured according to organic (wood, amber, coral, marine mollusk shell, ostrich eggshell, bone) and non-organic (stone, faience, glass, metal-in-glass, metal) materials. For each of these groups, we discuss the technique of manufacture, the shape, and, whenever possible, the provenience. Nonetheless, the overview in Table 1 and the images in Figures 2-16 are organized according to the revised chronology of the tombs.

Parallels are drawn from sites of the 1st-6th centuries in Egypt, the Levant, and the Arabian Peninsula, Nubian sites of the Classic Meroitic (1st-3rd centuries) and post-Meroitic (4th-6th centuries) periods, as well as Scandinavian, Baltic Sea, and Black Sea sites attributed to the period between the 7th and the beginning of the 9th centuries. We discuss the dating of the bead objects in view of the proposed timeline and the dating of known published types.

Since the analysis was made after the initial documentation of the corpus, it is based only on high-quality images of the material. It was therefore not always possible to identify materials and technical aspects related to bead production and use. It is indicated when no clear identification could be made and additional discussions and preliminary observations are provided.

### Wood

There are few wooden objects in the present corpus. Among them, a long barrel bead with ribbed decoration (Figure 6, 22.7) from a tomb of the 5th-6th centuries figures among the Greco-Roman types published by Nai Xia (2014:144, Plate XVI: R84). An amphora-shaped pendant from a grave of the 7th-8th centuries has a double-segmented collar below the perforated neck (Figure 12, 45.3).

### Amber

The amber found in Egypt probably originated in the Baltic Sea region, although some pieces may have been made of a non-fossilized tree resin (Harrell 2012). All amber beads and pendants in this study are reddish in color, some with a dusty coating. They are standard to long beads, some almost tabular, and often have rounded edges. They measure from 5 mm to ca. 15 mm in diameter (Figure 3, 7.4; Figure 4, 12.1; Figure 7, 31.2;[6] Figure 9, 37.7; Figure 11, 42.10, 44.6; Figure 12, 45.2, 46.2, 47.2; Figure 13, 48.17-18). One long bead measures 20 mm (Figure 13, 50.1). Some beads are slightly faceted into square or rectangular cylinders, bicones, or cones (Figure 3, 8.2; Figure 4, 12.6; Figure 5, 19.6; Figure 7, 29.4; Figure 11, 44.12; Figure 16, 63.3). Shapes less frequently encountered are long spindle-shaped beads (Figure 7, 28.1), a large discoidal bead (Figure 7, 31.1), and a large tabular one (Figure 11, 44.5), the latter two measuring about 25 mm in diameter.

At Matmar and Mostagedda, amber beads were placed in tombs of the late Roman (4th-6th centuries; nos. 7.4, 8.2) to early Islamic periods (7th-8th centuries; e.g., no. 50.1). With the exception of 50.1 from Mostagedda, all amber beads were recorded at Matmar. No site on the Egyptian Red Sea coast or in the Eastern Desert has yielded such examples. Neither have they been found at Meroitic and post-Meroitic sites in Nubia. The largest published collection of amber beads that provides parallels to the present corpus comes from the necropolis at Khirbat Yajuz in Jordan, and dates to the late Roman and early Byzantine periods (Eger and Khalil 2013).

**Table 1. Bead Object Chronology and Associations at Matmar and Mostagedda.**

| Date | | Site | Tomb no., area no. (object no.) – sex, age – beadwork |
|---|---|---|---|
| 30 BC-AD 299 | 30 BC-3rd c. AD | Mostagedda | *Tomb 576*, area 500 (1) – child – necklace |
| AD 100-399 | 2nd-4th c. | Mostagedda | *Tomb 573*, area 500 (2) – plundered body |
| AD 200-399 | 3rd-4th c. | Mostagedda | *Tomb 588*, area 500 (3-4) – woman ca. 18 years old – two strings of beads around the neck; *Tomb 1104*, area 1100 (5-6) – strings of beads attached to earrings |
| AD 300-599 | 4th-6th c. | Matmar | *Tomb 623*, area 600 (7-8) – female |
| AD 400-599 | 5th-6th c. | Matmar | *Tomb 601*, area 600 (9) – child – necklace; *Tomb 615*, area 600 (10); *Tomb 801*, area 800 (11) – six-year-old child – necklace; *Tomb 802*, area 800 (12) – three-year-old child – necklace; *Tomb 824*, area 800 (13) – eight-year-old child – necklace; *Tomb 825*, area 800 (14) – four-year-old child – necklace; *Tomb 829*, area 800 (15) – two-year-old child – necklace; *Tomb 834*, area 800 (16) – three-year-old child – necklace; *Tomb 843*, area 800 (17) – child; *Tomb 853*, area 800 (18-19) – six-year-old child – necklace; *Tomb 855*, area 800 (20) – necklace; *Tomb 1068*, area 1000 (21-22) – three-year-old child – necklace |
| AD 380-599 | End of 4th-6th c. | Matmar | *Tomb 831,*[7] area 800 (23) – four-year-old child – necklace |
| AD 400-699 | 5th-7th c. | Matmar | *Tomb 832*, area 800 (25) – adult |
| | | Mostagedda | *Tomb 577*, area 500 (24) – child – necklace |
| AD 500-699 | 6th-7th c. | Matmar | *Tomb 812*, area 800 (26) – six-year-old child – necklace; *Tomb 862*, area 800 (27) – eight-year-old child – necklace; *Tomb 1027*, Area 1000 (28) – ten-year-old child – necklace; *Tomb 1035*, area 1000 (29) – six-year-old child – necklace; *Tomb 1040*, Area 1000 (30) – four-year-old child – necklace; *Tomb 1045*, area 1000 (31) – seven-year-old child – necklace; *Tomb 1060*, area 1000 (32) – three-year-old child – necklace; *Tomb 1080*, area 1000 (33) – twelve-year-old child – necklace; *Tomb 1101*, area 1100 (34) – child, almost adult – necklace; *Tomb 1102*, area 1100 (35) – female – necklace |
| | | Mostagedda | *Tomb 574*, area 500 (36) – child – necklace |
| AD 555-699 | Mid-6th-7th c. | Matmar | *Tomb 1013*,[8] area 1000 (37-40) – young female |
| AD 500-799 | 6th-8th c. | Mostagedda | *Tomb 1429*, area 1400 (41) – fourteen-year-old child – beads at neck and waist |
| AD 600-799 | 7th-8th c. | Matmar | *Tomb 873*, area 800 (42) – four-year-old child – necklace; *Tomb 874*, area 800 (43) – two-year-old child – necklace; *Tomb 885*, area 800 (44) – necklace; *Tomb 1033*, area 1000 (45) – ten-year-old child – necklace; *Tomb 1038*, area 1000 (46) – female – necklace; *Tomb 1053*, area 1000 (47) – six-year-old child – necklace; *Tomb 1301*, area 1300 (48) – eight-year-old child – necklace |
| | | Mostagedda | *Tomb 1411*, area 1400 (49-57) – young girl – on body over the wrappings, on chest and pelvis |
| AD 600-824 | 7th-early 9th c. | Mostagedda | *Tomb 1844*, area 1800 (58-59) – necklace |
| AD 700-824 | 8th-early 9th c. | Mostagedda | *Tomb possibly 1441*, area 1400 (60-61) – child |
| Not dated | Possibly 5th-8th c. | Mostagedda | *Tomb possibly 1407*, area 1400 (62) – child – beads at neck |
| Not dated | | Matmar | Area 800 (63, 64), surface finds or collected from unknown burials |


**Figure 2.** Mostagedda objects 1-6, 1st-4th centuries (all images by the authors unless otherwise stated).

**Figure 3.** Matmar objects 7-10, 4th-6th centuries; original stringing: 7 (3.9 courtesy of Staatliches Museum für Ägyptischer Kunst, Munich).

Several different shapes of amber/resin pendants are present as well. A tabular example is most probably made of amber (Figure 9, 37.13). Another, much larger in size, has a tabular teardrop shape and measures about 13 mm in width (Figure 11, 42.15). An example of a flattened amphora shape may display a collar below the perforated neck (Figure 12, 45.4), while a fragment of a perforated neck most probably belongs to one of the amphora shapes (Figure 13, 48.7). Whereas the tabular pendant is dated to the mid-6th to 7th centuries, the other amber pendants are attributable to the 7th-8th centuries.

**Coral**

In general, the branches of Mediterranean Sea *Corallium rubrum* were cut into short standard and long cylinder beads, more or less regularly shaped (Figure 2, 1.2?, 6.14; Figure 3, 7.1?; Figure 4, 11.1; Figure 5, 20.3; Figure 6, 22.5, 23.2, 26.1; Figure 7, 27.2; Figure 8, 35.1, 35.6?; Figure 9, 37.15; Figure 12, 47.4). A long cylinder has incised collars at the ends (Figure 15, 55.2). Apart from one early Roman tomb at Mostagedda (no. 576) where beads of a faded, light salmon color (1.2) are tentatively identified as corals, all remaining coral beads were found in later funerary contexts.

Parallels for contemporary coral beads of similar shapes are abundant. Standard to long coral beads were found in Coffin B from Tomb LXVI at al-Bagawat (Kharga Oasis in the Western Desert of Egypt) which dates between the 4th and 7th centuries (MET 31.8.4). Other examples of coral beads from al-Baghawat come from Tomb XXIII (MET 31.8.33) of the 4th century. Small tubular coral beads are also found in late Roman contexts at Egyptian sites in the Eastern Desert and at the Red Sea (e.g., Then-Obłuska 2019a and references). Examples that are larger in diameter come from the post-Meroitic royal tombs at Qustul and Ballana in Lower Nubia (*see* Then-Obłuska 2016c for references).

Despite the wide presence of coral beads on site, only a few pendants made of *Corallium rubrum* were recorded. A long, curved example (Figure 5, 20.4) and another carved to a shape similar to an amphora (Figure 7, 27.6) come from tombs dated to the 5th-6th and 6th-7th centuries, respectively.

**Marine Mollusc Shell**

A variety of Red Sea and Mediterranean marine molluscs are reported at the two sites. Marine shells are typically perforated by cutting a hole in the whorl or dorsum, but a few examples from a tomb dated to the 7th-8th centuries at Matmar were shaped into beads (Figure 13, 48.4). So far, beads cut from marine shell have been recorded mainly in late Roman contexts at the Red Sea port sites of Marsa Nakari and Berenike (Then-Obłuska 2019a), in the Eastern Desert at Shenshef and Sikait (Then-Obłuska 2017a, 2019b), and in the mid-4th-century tombs at the Blemmyan Wadi Qitna site in the Nile Valley (Then-Obłuska 2016a, wrongly identified as a bone bead).

*Nassarius gibbosulus* was the only species of Mediterranean Sea provenience in the collection that was perforated (Figure 5, 17.1; Figure 8, 32.3, 33.1; Figure 15, 57.3; Figure 16, 61.1). The examples from Matmar and Mostagedda were perforated by cutting a hole in the shell dorsum, and came from tombs of varied chronology, dating from the 5th century to as late as the beginning of the 9th century. Analogous examples have also been recorded in late Roman contexts at Berenike, as well as in a 4th-century Blemmyan grave at Bab Kalabsha (Then-Obłuska 2015 and references).

Except for an example of unidentified shell species (Figure 10, 41.1) and the above-mentioned *Nassarius gibbosulus*, all other perforated mollusc shells are of species living in the Red Sea. The first is *Clanculus pharaonius* (Figure 2, 5.1) found in a tomb at Mostagedda dated between the 3rd and 4th centuries.

*Conus taeniatus* (Figure 10, 40.1; Figure 11, 43.11?; Figure 13, 48.2?; Figure 15, 57.2) comes from tombs dated between the mid-6th and 8th centuries. The species is documented in late Roman contexts at Berenike (Then-Obłuska 2015: Figure 1.13) and al-Bagawat (MET 31.8.33 from the 4th-century Tomb XXIII).

*Cypraeidae* sp., a large shell measuring about 30 mm in length (Figure 2, 5.1), was found in a tomb dating between the 3rd and 4th centuries at Mostagedda. A similar specimen 45 mm in length, provided with two perforations, was recorded in a late Roman rubbish pit at Berenike (Then-Obłuska 2015: Figure 1.12). *Cypraea (Monetaria) annulus* (Figure 2, 1.1, 3.1) was found in both early and late Roman tombs at Mostagedda. Examples from Berenike have been found in late Roman contexts (Then-Obłuska 2015: Figure 1.14).

Long beads cut from dentalium shells (Figure 9, 37.4, 38.1) have been found in a tomb datable to the mid-6th to 7th centuries. Based on the illustrations, it is unclear whether the segments belong to *Dentalium* sp. or *Dentalium reevei*, a species with nine ribs. Both species have been found in early and late Roman contexts at Red Sea coastal and Eastern Desert sites (Hamilton-Dyer 2001:363, Figure 11.5: 96, Mons Claudianus, 2007:348-349, Figure 14.8.51 [*Dentalium reevei*], 14.8.52 [*Dentalium* sp.], Mons Porphyrities; Then-

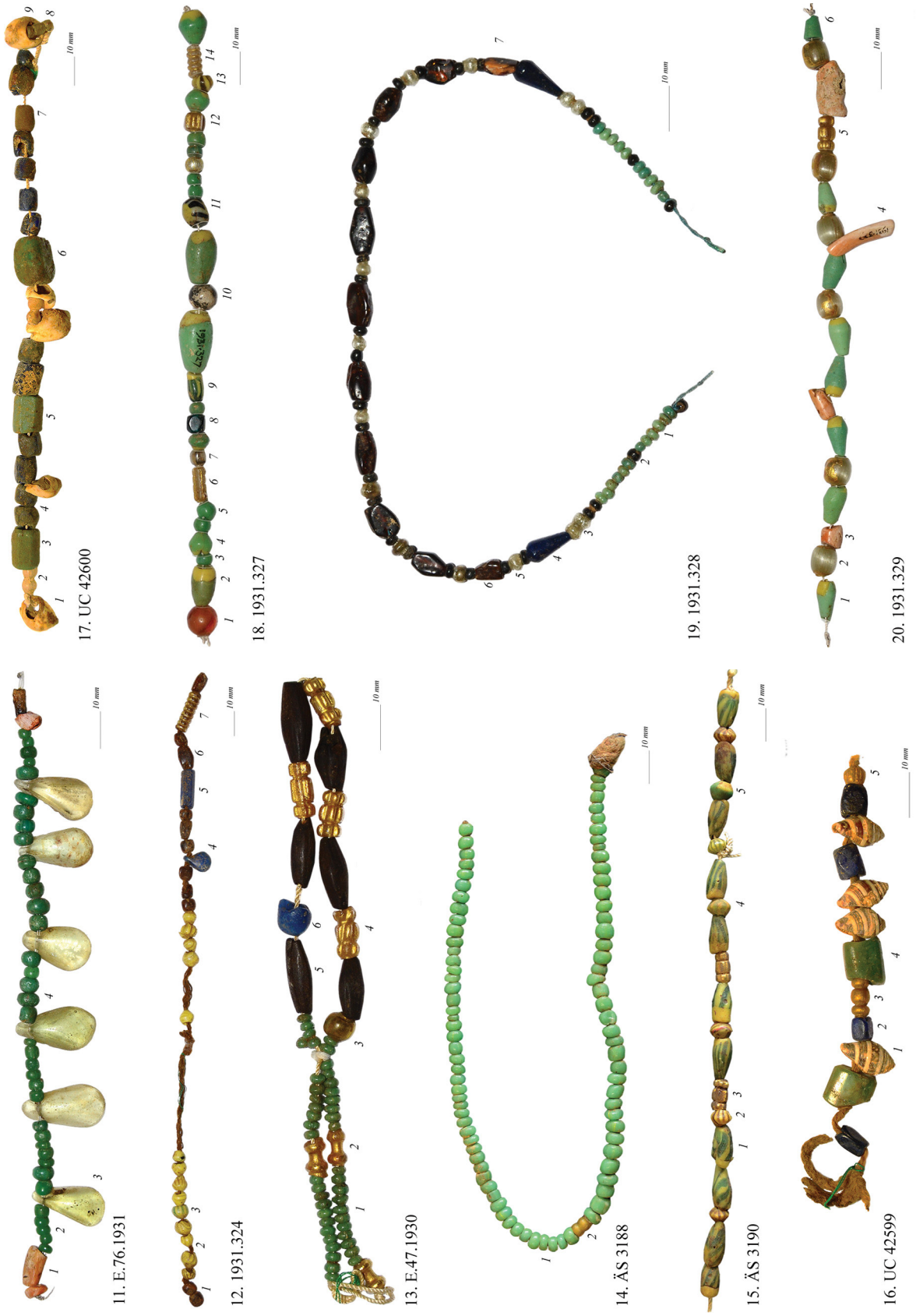



**Figure 4.** Matmar objects 11-16, 5th-6th centuries; original stringing: 12, 14, 16.

**Figure 5.** Matmar objects 17-20, 5th-6th centuries.

Obłuska 2017a: Figure 6.11, Shenshef, 2019a: Figure 2.1, Marsa Nakari; Berenike, BE95-001-080#147, pers. obs.). Segments of similar shell species were also common in graves at el-Dur (Haerinck 2001: Plates 47.67-68, 140.217, 146.20, 156.3, 160.6, 245.9, 247.5, 265.9, 274.8, 305.8) on the west coast of the Oman peninsula, but these examples are considerably earlier, since the activity on site declined during the first half of the 2nd century.

*Engina mendicaria* (Figure 4, 16.1; Figure 15, 57.1) specimens were perforated by cutting a hole in the body whorl. They were found at Matmar in a tomb of the 5th-6th centuries and at Mostagedda in a tomb of the 7th-8th centuries. This species was also reported in early and late Roman contexts at Berenike (Then-Obłuska 2015: Figure 1.2, early Roman Berenike, body whorl cut; Figure 1.5, late Roman Berenike, apex removed).

Two beads found in a tomb dated between the mid-6th and 7th centuries (Figure 9, 37.9) may be made of *Marginella* sp. Similar examples were recorded in late Roman contexts at Berenike (Then-Obłuska 2015: Figure 1.6), as well as at Meroë in Nubia (MFA 23-2-303g). *Nerita* sp. (Figure 5, 17.9) has been recorded in a tomb of the 5th-6th centuries at Matmar. Similar examples were recorded in late Roman layers at Berenike (Then-Obłuska 2015: Figure 1.4).

Nacre, or mother-of-pearl, is an organic/inorganic composite material produced by some molluscs as an interior shell layer. The nacre pendants found at Matmar were most likely made of *Pteria macroptera*, a Red Sea species. They were cut into round plaques, have a protruding elongated suspension, and measure about 20 mm in height (Figure 7, 29.7; Figure 16, 63.6). Some were found in a tomb dated between the 6th and 7th centuries (Figure 7, 29.7); others are decontextualized (Figure 16, 63.6). Another type cut from nacre is a plaque of amorphous, possibly zoomorphic shape, provided with a regular round perforation (Figure 13, 48.13). It was found in a tomb dating to the 7th-8th centuries.

### Ostrich Eggshell

Short cylinder beads made of ostrich eggshell (Figure 16, 59.2, 60.1, 61.2) were found in tombs made between the 7th and early 9th centuries. In the Egyptian Eastern Desert and at the Red Sea port of Berenike, however, they were mainly recorded in late Roman contexts (Then-Obłuska 2015, 2016a, 2017a, 2018b, 2019b). They were also found in the 4th-century Tomb XXIII, al-Bagawat, Kharga Oasis in the Western Desert, but wrongly identified as ivory (MET 31.8.32). Such beads became common at post-Meroitic sites in Nubia (Then-Obłuska 2018b).

### Bone

A large bone barrel bead ca. 17 mm long and decorated with a double incision around the center (Figure 3, 7.3) was found in a tomb of the 4th-6th centuries. In addition, two types of amphora-shaped bone pendants distinguishable by the shape of the perforated neck were also recorded. The first type has a regular neck (Figure 6, 23.4), whereas the second has a narrow carved neck (Figure 6, 23.6). They were found together in a tomb dating between the end of the 4th century and the 6th century. A slightly different amphora pendant was found in Tomb XXIII at al-Bagawat (MET 31.8.33). Another pendant type is characterized by a double-segmented base and a similar double-segmented collar (Figure 13, 48.15). It was found in a tomb dated between the 7th and 8th centuries.

Several bone crosses were also recorded. One type was found in a tomb dated to the 7th-8th centuries. The flat body has a projection for suspension and flared arms decorated with double incised lines (Figure 13, 48.6). A cross from the same tomb has flared arms, a narrowed neck, and a central part decorated with two diagonally running lines (Figure 13, 48.14). Several crosses from an unidentified tomb at Matmar have flared arms decorated with incisions on one side (Figure 16, 64). In contrast to the rest, these examples lack a suspension lug and were perforated through the top of the upper arm.

### Stone

A variety of stone beads and pendants are present in the corpus. In addition to soft stone (steatite), many types were made of hard stone including carnelian, agate, amethyst, amazonite, and beryl. The majority are made from stones that were likely mined in the Egyptian Eastern Desert (Harrell 2004, 2006, 2012), but some agate and amethyst beads may have originated in India.

#### *Steatite*

A short cylinder bead, almost black in color and most probably made of steatite, is fluted around its edge (Figure 6, 22.6). It came from a tomb dated to the 5th-6th centuries. A short oblate bead made of a soft whitish stone (Figure 15, 58.2) was found in a tomb dating between the 7th and the beginning of the 9th centuries.

#### *Carnelian*

Examples similar to the small ellipsoid carnelian beads at the two sites (Figure 2, 1.3, 3.2) were also often

included in bead objects found in Nubia and datable to the first centuries AD (e.g., Then-Obluska 2016b). Carnelian or red agate standard bicones (Figure 2, 4.4, 6.15) were found together with globular beads in tombs dating to early and late Roman times.

Carnelian beads were also found at Matmar and Mostagedda in much later tombs of the 6th-8th centuries. These were worked into short oblate (Figure 8, 35.2), globular (Figure 8, 35.4; Figure 10, 40.4; Figure 11, 44.7), irregular globular (Figure 11, 42.7, 43.7; Figure 14, 51.1, Figure 15, 58.4), convex cone (Figure 11, 42.17), and short biconical shapes (Figure 10, 40.2). Faceted beads include a long hexagonal truncated bicone ca. 10 mm in length (Figure 10, 40.6) and a long rectangular truncated bicone ca. 15 mm in length (Figure 11, 43.10; Figure 12, 46.10; Figure 14, 51.2). Some faceted beads have less regular shapes (Figure 11, 44.11 [ca. 22 mm long], 58.9). Long faceted bicones are usually found in late Roman Egypt and post-Meroitic Nubia, from the 4th to 6th centuries (e.g., Then-Obłuska 2015, 2018b).

A red pendant in the shape of a poppy-seed capsule (Figure 15, 55.13) is usually found in New Kingdom and later assemblages in Egypt and Nubia (Beck 1928: Figure 24, B.3.d), and was clearly reused for burial.

### *Agate*

The long barrels of banded agate (Figure 2, 4.2, 4.5, 4.8) have parallels in early Roman assemblages (Then-Obłuska 2018a: Figure 4.24-28). Globular beads of red banded agate (Figure 12, 46.3) and onyx (Figure 12, 46.11) with perfectly polished surfaces and very small holes are found in tombs of the 7th and 8th centuries.

### *Amethyst*

Amethyst of a vivid purple color was shaped into standard and short bicones (Figure 2, 4.3), as well as globular forms (Figure 2, 4.6). Although short and standard-length beads came from a tomb dated to the 3rd-4th centuries at Mostagedda, these types appear earlier at other sites in Egypt and elsewhere in the Middle East. Short and standard bicones were found together with biconical and globular agate beads (cf. 4.4, 6.15 above), and long barrels of agate/onyx (cf. 4.2, 4.5 above) in a 1st-century grave at Berenike (Then-Obłuska 2018a: Figure 5). Furthermore, amethyst and red agate or carnelian bicone beads, agate long barrels, and white-banded black-glass long barrels (cf. 4.9 below) were among the beads in well-preserved wooden coffins dating to the beginning of the 1st century BC at En Gedi, an oasis on the shores of the Dead Sea (Spaer 1993:19, Plate IIA). Globular amethyst beads were found in Meroitic tomb Beg. S 125 at Meroë (MFA 21-2-375n; 7 mm diameter).

A few other types of amethyst beads, often much paler in color than the ones discussed above, could be distinguished. One type consists of small oval, probably slightly tabular, beads that measure 5-10 mm in length (Figure 8, 35.5; Figure 10, 40.5; Figure 12, 47.3). Another type comprises larger beads, of which long droplet/almond-shaped (Figure 6, 26.2; Figure 7, 28.3; Figure 11, 44.9, 44.14; Figure 12, 46.8; Figure 13, 50.2) and long oval examples (Figure 12: 46.7) can measure up to about 20 mm in length. These types appear in tombs dating to the 6th-8th centuries, but comparanda from Egypt date to earlier times. Amethyst beads were recorded in Tomb XXIII (4th century) at al-Bagawat (MET 31.8.33).

Droplet/almond-shaped amethyst beads and pendants were widely used in the 6th and 7th centuries across the Mediterranean and beyond. A fair number of examples of jewelry incorporating amethyst beads on metal links have been reported at sites in Egypt or the Eastern Mediterranean (Drauschke 2010). Droplet/almond-shaped amethyst beads were also imported into Europe starting in the late 6th century. Long beads of a paler color were similarly imported into Europe and Anglo-Saxon England in the mid-7th century (Brugmann 2004:40; Koch 1987:346).

There are amethyst deposits in the Eastern Desert in the Wadi el-Hudi (Shaw 2007; late Roman mine) and Abu Diyeiba regions. The latter is a very large mine that was a major source of amethyst during the Ptolemaic and early Roman periods (Harrell 2004, 2006). So far there is no evidence of amethyst mines in Egypt after the 6th century (James A. Harrell 2019: pers. comm.).

### *Amazonite*

A large, round tabular bead measuring about 22 mm in diameter was found in a tomb dated to the 7th-8th centuries. It may be made of amazonite (Figure 13, 48.11), but a definite identification cannot be made on the basis of the illustrations.

### *Beryl*

Some large cylinder beads of green beryl (Figure 2, 6.13; Figure 4, 16.4; Figure 5, 17.6?), were found in tombs dated to the 3rd-6th centuries. A teardrop pendant made of a stone that appears to be dark green in color, probably emerald,

measures about 18 mm in length (Figure 15, 58.18). It was found in a tomb dating between the 7th and the beginning of 9th centuries. Both beryl and emerald are known to have been mined in the Eastern Desert in the Mons Smaragdus region (Harrell 2012 and references; Then-Obłuska 2019b).

### Faience

A short cylinder bead made of red faience (Figure 2, 1.7) was found in an early Roman tomb at Mostagedda. Such small beads were produced in many colors and are common finds at early Roman sites in Egypt and Meroitic sites in Lower Nubia (Then-Obłuska 2015, 2016b). By the 3rd century, the production of faience had pretty much stopped in Egypt thus providing a *terminus ante quem* for the production of the examples found at Matmar and Mostagedda.

### Glass and Metal-in-Glass

Glass and metal-in-glass beads are described below according to the technique of manufacture. Several types are associated with Egyptian production (drawn and segmented glass and gold-in-glass), while others relate to production centers in India/Sri Lanka (drawn and rounded glass) (e.g., Francis 2002; Then-Obłuska 2015 and references).

#### *Drawn and Cut Glass*

A translucent blue (Figure 13, 49.1) and some black (Figure 13, 49.2) beads are made of drawn glass but it is uncertain how their ends were finished. Wide short cylinders up to 7 mm in diameter and smaller short to standard cylinders about 3 mm in diameter are tube sections of drawn translucent green glass (Figure 8, 35.13). They were found in a tomb dating to the 6th-7th centuries.

A green translucent drawn tube decorated with alternating red and yellow stripes (Figure 15, 58.5) was found in a tomb dating between the 7th and the beginning of the 9th centuries. The bead was most probably made by cutting the tube into sections and fire polishing the ends. Similar styles figure among Islamic beads attributed to the 10th century by Lankton (2003: Figure 8.0, above, no. 700).

#### *Drawn Glass and Metal-in-Glass with Pinched Ends*

Translucent dark blue beads (Figure 2, 2.1) were made from a drawn tube that was cut or pinched into sections whose ends were then fire polished. The same procedure was also used to create a long ellipsoid bead of green glass (Figure 2, 6.6), a long translucent blue bicone (Figure 3, 7.2), and several smaller oblates of dark blue (Figure 2, 6.4), green (Figure 2, 6.9) and black glass (Figure 2, 6.11). Most of these beads were found in tombs dating to before the 4th century.

This technique of manufacture may have been used for beads found in later tombs. Translucent amber ellipsoids (Figure 6, 24.2) and long cylinders of opaque green glass about 5 mm in diameter and 8 mm in length (Figure 7, 27.1) are most probably pinched-off sections of drawn tubes. This might also be the case for several very long dark blue cylinders (Figure 8, 34.8, 34.9) about 20 mm in length that were found in tombs of the 5th-7th centuries.

There are a number of decorated beads dating to the 7th-8th centuries that were produced in an identical fashion. A few globular, semi-translucent green beads roughly 7 mm in diameter have slight traces of ribbing similar to melon beads (Figure 11, 42.9). Other globular beads represent sections of drawn black tubes with applied white stripes (Figure 11, 42.11), or sections of glass tubes with yellow, white, and red stripes (Figure 11, 42.16). A long bead made of brown glass (Figure 15, 58.7) was found in a tomb dating between the 7th and the beginning of the 9th centuries.

In addition to glass beads, several metal-in-glass types were also cut or pinched from tubes and had the ends fire polished. These gold-in-glass globular beads (Figure 2, 1.6, 3.5, 6.7), bicones (Figure 2, 1.4), and silver-in-glass globular beads (Figure 2, 2.2, 6.8) were found in tombs dating between the 1st and 4th centuries.

#### *Drawn Segmented Glass and Metal-in-Glass*

Drawn glass and metal-in-glass (cf. below) tubes were formed into single or multiple segments that were usually globular or oblate and of varying length (disc and short). They differ according to the size and shape of the interspaces, which probably reflect the form of the mold in which the beads were segmented. These are among the most common bead types found in Egypt and Nubia between the 1st and 6th centuries (e.g., Then-Obłuska 2015; Then-Obłuska with Wagner 2019).

Single-segment beads are small, usually oblate to globular, and 3-8 mm in diameter. At the two sites, they come from tombs dated to the 4th-6th centuries and continue to be placed in burials up to the 7th-8th centuries. They are opaque red (Figure 3, 8.5; Figure 9, 37.3, 38.2; Figure 11, 43.14; Figure 12, 46.12), black (Figure 3, 8.3; Figure


**Figure 6.** Matmar and Mostagedda objects 21-26, 5th-7th centuries; original stringing: 21.

**Figure 7.** Matmar objects 27-31, 6th-7th centuries.

5, 19.2; Figure 9, 37.6, 38.3; Figure 11, 44.2; Figure 12, 47.6), translucent and semi-translucent green (Figure 3, 7.4; Figure 4, 13.1; Figure 5, 19.1; Figure 6, 23.1; Figure 9, 37.1; Figure 13, 50.7), opaque green (Figure 11, 44.1), translucent dark blue (Figure 8, 34.5, 35.9; Figure 9: 37.17; Figure 11, 42.5), semi-translucent yellow (Figure 9, 37.8; Figure 11, 43.12; Figure 15, 55.1), translucent turquoise (Figure 11, 42.6), translucent golden yellow (Figure 11, 42.4), and opaque blue (Figure 11, 43.4). Some beads are preserved as double-segments in red (Figure 9, 38.4), opaque green (Figure 11, 43.6), and dark blue (Figure 11: 43.9). There are also small and black double- and multiple-segmented beads (Figure 11, 42.3, 42.18) in tombs from Matmar. No colors can be provided for many single- and double-segment beads (Figure 3, 9.2, 9.4) due to the limited resolution of the illustrations. Larger examples about 8 mm in diameter in translucent yellow or amber glass may be imitations of gold-in-glass types (Figure 4, 13.3).

Some single-segment small beads from tombs of the 7th-8th centuries are standard cylinders of varied color. The corpus includes yellow (Figure 11, 42.1, 43.16), green (Figure 11, 42.2, 43.1), blue (Figure 11, 43.2), dark green (Figure 11, 43.5), and black long cylinder-like beads (Figure 11, 42.14). One dark green cylinder has a yellow layer discernible at the end (Figure 11, 43.15). A yellow oblate from a tomb of the 7th-8th centuries was decorated with ribs (Figure 13, 50.4).

Small, single-segment beads of gold-in-glass (Figure 3, 10.2; Figure 5, 18.7; Figure 6, 24.1; Figure 8, 35.3, 36.8; Figure 9, 37.2) and silver-in-glass (Figure 3, 8.4; Figure 5, 19.5) are either regular or oblate to globular in shape, as are several small gold-in-glass (Figure 6, 25.2) and silver-in-glass (Figure 5, 17.2, 19.3; Figure 8, 36.2; Figure 11, 42.8) double-segments. A gold-in-glass quadruple-segment bead has short oblate segments (Figure 5, 18.6). Single- (Figure 8, 32.7), quintuple- (Figure 5, 18.14) and octuple-segment beads (Figure 4, 12.7) have oblate disc segments. Other examples are long single-segment beads (Figure 8, 32.8). These regular single- to multiple-segment beads made of metal-in-glass are found in tombs dated to the 5th-6th and 7th-8th centuries. Some single-segment gold-in-glass beads that were found in a grave of the 5th-6th centuries are larger, measuring about 8 mm in diameter (Figure 5, 20.2).

One type of double-segmented gold-in-glass bead has very wide and deep spaces between the segments (Figure 4, 13.2; Figure 6, 22.4). This type is found in Matmar tombs dated between 400 and 599. A similar example was placed together with other beads in Coffin B of Tomb LXVI at al-Bagawat which is dated to between the 4th and 7th centuries (MET 31.8.4). Another gold-in-glass double-segmented bead from a tomb dating to the 5th-6th centuries has a very narrow and shallow interspace (Figure 4, 14.2), as do several multi-segment beads (Figure 8, 34.11) from a tomb of the 6th-7th centuries.

Some silver-in-glass single-segment beads are globular and practically lack any trace of segmenting (Figure 13, 50.5; Figure 15, 55.7). These were found in funerary contexts of the 7th-8th centuries.

Some triple-segmented gold-in-glass beads have a longer central segment on account of which they are called collared beads (Figure 4, 16.3; Figure 5, 17.8; Figure 8, 36.1). They were found in tombs that span the 5th-7th centuries. Contrary to most other examples that are transparent, some of the collared beads are made of a translucent golden yellow glass (Figure 9, 37.21; Figure 13, 50.6). The same type of glass can be observed in several single-segment beads (Figure 9, 37.18; Figure 11, 42.19, 44.8; Figure 13, 48.16, 50.3; Figure 15, 55.12). Interestingly, golden yellow examples come from tombs of a slightly later date, ranging from the mid-6th to 8th centuries.

Several gold-in-glass single-segments found in graves of the 5th-7th centuries are ribbed (Figure 4, 16.5; Figure 5, 18.12; Figure 7, 27.3). Several triple-segment gold-in-glass beads of similar date at the two sites are also ribbed (Figure 4, 13.4, 15.3; Figure 5, 20.5). A similar earlier example comes from the 4th-century Tomb XXIII at al-Bagawat (MET 31.8.33).

A dainty gold-in-glass bead found in a tomb dated to the 3rd-4th centuries exhibits three rows of granulation (Figure 2, 3.6), and is similar to beads found in tombs at En Gedi dated to around the beginning of the 1st century (cf. above Spaer 1993:19, Plate IIA).

Some triple-, quadruple-, and septuple-segmented silver-in-glass beads found in a tomb of the 5th-6th centuries (Figure 6: 22.1, 22.8, 22.9) are characterized by an inner glass layer that is much smaller in diameter than the overlying layer. The difference creates a slight space between the layers that is discernible in every segment.

### *Drawn and Rounded Glass*

Drawn and rounded green glass beads (Figure 4, 11.2, 14.1; Figure 6, 23.3; Figure 18, 18.3) have been found in tombs dated between the end of the 4th and the 6th centuries. Parallels are common at Egyptian Red Sea ports and at the surrounding desert sites during the late Roman period (Francis 2002; Then-Obłuska 2015, 2017a, 2018a, 2019a, b). The chemical composition of early Roman examples found


**Figure 8.** Matmar and Mostagedda objects 32-36, 6th-7th centuries (figure 8.36 courtesy of The National Museum, Bloemfontein, South Africa).

**Figure 9.** Matmar objects 37-38, mid-6th-7th centuries.

at Quseir indicates a South Indian/Sri Lankan provenience (Then-Obłuska and Dussubieux 2016). The type has also been reported in layers datable to the same period at sites along the Nile Valley in Sudan, as well as at some sites in ancient Aksum (Then-Obłuska 2019c). Examples from Sudan have been identified both macroscopically and in the laboratory as Indo-Pacific beads of South Indian/Sri Lankan origin (e.g., Then-Obłuska and Wagner 2019; Then-Obłuska with Wagner 2019).

Several opaque light green beads (Figure 6, 21, 22.3) from a tomb dated to the 5th-6th centuries also appear to have been made of drawn and rounded glass. Their quality (bubbles in the glass core), however, is lower than that of drawn glass beads of Indian/Sri Lankan origin, which precludes this provenience.

### *Wound Monochrome Glass*

Transparent wound glass was used to manufacture long beads that are generally between 10 mm (Figure 15, 55.10) and 20 mm in length (Figure 15, 58.15). Large globular beads ca. 15 mm in diameter were also made of transparent wound glass (Figure 15, 58.11). All these transparent beads come from tombs dated between the 7th and the beginning of the 9th centuries.

Translucent blue, green, and purple flattened beads (Figure 14, 52-54) were found in tomb 1411 at Mostagedda, which is dated to the 7th-8th centuries There are similar green examples that date to the late Roman period (Arveiller-Dulong and Nenna 2011:188, cat. 233).

Some simple short oblate beads are made of a translucent dark green glass (Figure 8, 35.8; Figure 9, 37.19) while others about 15 mm in diameter are composed of dark blue or black glass (Figure 8, 33.2). Long spindle-shaped beads (Figure 3, 9.1, 9.3) and a cylindrical example in translucent dark green (Figure 8, 32.9) seem to be wound, judging from the illustrations. A long bicone of opaque green glass is most probably made of wound glass (Figure 10, 39.8), as well as a tapered long cylinder of dark blue glass (Figure 13, 48.10).

Several double-, triple-, and quadruple-segment beads of translucent dark blue glass appear to be wound (Figure 8, 32.1-2, 32.4-5 [this is also a double-segment although only a fragment is visible]). They measure about 5 mm in diameter and were found in a tomb dated to the 6th-7th centuries.

There are several decorated examples. For instance, a long barrel bead of translucent dark blue glass is adorned with a spiral-fluted pattern (Figure 6, 22.2), while a long black bead has slightly twisted longitudinal ribs (Figure 12, 46.4).

### *Wound Bichrome Glass*

Some long barrel beads were made by winding black and white glass into a zoned configuration (Figure 2, 4.9, 4.10). They were found in a tomb dated to the 3rd-4th centuries. Similar globular black beads roughly 10 mm in diameter exhibit a trailed white line around the middle (Figure 11, 44.4, 62.8). They came from tombs dated to the 7th-8th and 5th-8th centuries.

### *Wound Glass with Applied Stratified Eyes*

Some beads from early Roman tombs at Matmar and Mostagedda are decorated with stratified eyes set into the translucent light blue body. The eyes were made by alternating three layers, two white and one transparent, and placing a central translucent blue dot on top (Figure 2, 1.5). The eyes of a bead from a tomb dated to the 3rd and 4th centuries have three white layers alternating with two colorless ones (Figure 2, 6.16). There are notable parallels for the beads found on site, but all have been recorded in considerably earlier contexts.

In general, blue beads with seven eyes were popular in the Late Period, Ptolemaic, and early Roman periods in Egypt (Arveiller-Dulong and Nenna 2011:168-169, cat. no. 209.2, 6th-3rd centuries BC, 220-221, cat. nos 299.26, 72, 74, 79, 1st century BC-1st century AD) and in the Meroitic period in Nubia (Dunham 1963:152, Figure S, Type XIj; W 159 [50-55]?). Examples from the Northern Black Sea region also date from the 1st century BC to the 1st century AD (Alekseeva 1975: Type 68, Plate 14:21-23). Similar stratified eye beads are known from Taxila, Pakistan (Beck 1941: Plate I:14), Persepolis, Iran (Dubin 2009:382, note II, Object 23, Plate 334, Figure 23, 300 BC), Xu Jialing, China (Gan et al. 2009: Figure 24.1, 500 BC), Niya in Xinjiang, China (Lin 2010:204, Figure 4, 1st century BC-4th century AD), and the Sen-Mu-Sai-Mu grotto site, Kuche county, China (Liu et al. 2012: Figure 2: XJ-34, late 2nd to early 3rd centuries, Eastern Han Dynasty). The latter falls into a chemical compositional group defined for Sasanian glass (Liu et al. 2012:2137). A bead similar to 6.16 was found in an early Roman context at Berenike (Then-Obłuska 2015: Figure 5:17, BE11-76/999/PB021, D7.7, L6.4, HD2.7).

### *Folded Monochrome Glass*

Some dark green elongated beads from a tomb dated to the 3rd-4th centuries seem to bear traces of a seam which typically results from folding a glass strip around a mandrel (Figure 2, 6.5). Several examples that appear black in the


**Figure 10.** Matmar and Mostagedda objects 39-41, mid-6th-8th centuries (10.41 courtesy of The National Museum, Bloemfontein, South Africa).

**Figure 11.** Matmar objects 42-44, 7th-8th centuries.

illustrations but may in fact be dark purple were formed by folding glass strips into globular shapes (Figure 3, 10.1). Long strips of black glass were also folded into spindle-shaped beads (Figure 4, 13.5) and are associated with a grave of the 5th-6th centuries. The same technique was used to create larger beads of clearly dark purple color with a ca. 10 mm diameter (Figure 8, 34.11). They were placed in a grave of the 6th-7th centuries together with a roughly shaped bead that bears traces of a seam (Figure 8, 34.4) and likely belongs to the same typological group.

A long conical dark blue bead 15 mm in length may be made of folded glass, but the seam is not discernible in the illustrations (Figure 7, 27.5). The same production method may have been employed for a long bicone of translucent yellow amber (Figure 7, 27.4). Both types were found in a tomb dated to the 6th-7th centuries.

### *Folded Bichrome and Polychrome Glass*

Black-and-white banded glass strips were folded into elongated (Figure 2, 3.4; Figure 8, 36.7?; Figure 15, 55.5, 55.8, 55.14), long cylinder (Figure 2, 6.1), globular (Figure 2, 6.3), and ellipsoid shapes (Figure 8, 36.6). These beads appear in tombs dated to the 3rd-4th centuries and continued to be placed in graves of the 7th-8th centuries. Another type was made by folding a band of mosaic striped glass into a long cylinder. The several examples of this type exhibit two white stripes alternating with two dark blue or black ones, and have golden-yellow ends (Figure 15, 55.6; Figure 16, 60.7). They were found in two graves of the 7th-8th and 8th-early 9th centuries, respectively.

A long hexagonal (?) capped mosaic cylinder found in a tomb dating to the 7th-8th centuries was most probably made by folding a preformed strip of fused cane sections (Figure 12, 46.6). Two different cane sections, one with a concentric pattern of white, red, white, and dark blue rings surrounding a dark blue center and the other with a quatrefoil with yellow leaves, were applied in an alternating fashion with red caps at the ends. Somewhat similar beads date to the 2nd and 3rd centuries, and continue into Byzantine times (Spaer 2001: cat. 221-2). Examples that are decorated with a checkerboard pattern instead of an eye are later and come from contexts dating between 750 and 800 (Callmer 1997:199, Plate 16, A13, 2003:42, Figure 4.2, A13).

### *Joined Glass*

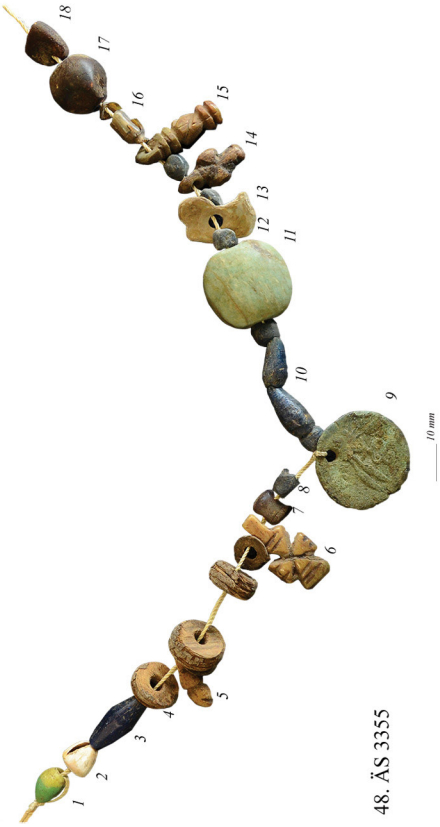
Joined glass beads of diverse patterns have only been recorded in tombs of the 7th to early 9th centuries. Some beads in the corpus have globular or elongated shapes and were made by joining mosaic cane sections with eye patterns. The mosaic cane sections of the globular examples have a concentric pattern of red, white, and blue rings around a yellow center (Figure 15, 58.3). Beads made of similar cane sections are tentatively associated with Egypt and are dated either to after 600 (MET 10.130.3285, 10.130.3286) or to the 1st century (MET 10.130.3294). In Lower Nubia, a comparable bead was found at Serra East and is dated to the Christian period (post 6th century) (OIM E24655; pers. obs.).

The cane sections of the elongated beads have a yellow center bordered by a red ring and radial stripes of translucent dark green and opaque yellow colors, the latter appearing as light green (Figure 15, 58.10). Beads made of such cane sections are typically associated with Egyptian production and usually date to the 9th century (MET 10.130.3288).[9] Lankton (2003:76, Figure 8.2) associates this type with bead production in Fustat (Old Cairo) during the 9th-11th centuries. A type with a cane section having the same pattern found in Scandinavia and the Baltic region is dated between 750 and ca. 800, and described as of "oriental origin" (Callmer 1997:199, Plate 16, A33, 2003:42, Figure 4.2, A33).

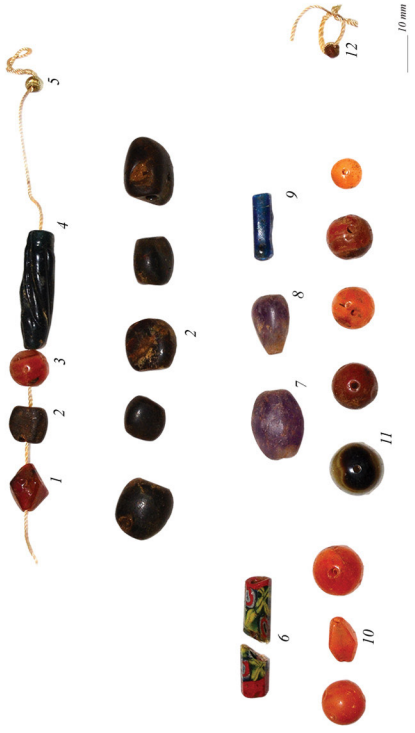
The mosaic cane sections of some globular and elongated beads have a yellow center that is bordered with a red ring which contains radial(?) stripes in translucent dark blue and white, appearing light blue (Figure 15, 58.8, 58.17). This type is also well represented in Scandinavian and Baltic assemblages. It is also of oriental origin and dated to the first quarter of the 9th century (Callmer 1997:199, Plate 16, B22, 2003:42, Figure 4.2, B22). In contrast to the above-mentioned types, the mosaic cane sections of another globular bead have a white center (Figure 15, 58.16).

### *Mandrel/Rod-Pierced Glass*

A semi-translucent blue glass strip (Figure 4, 13.6) and an opaque green one were most probably pierced with a rod/mandrel and marvered into beads (Figure 5, 18.5). Teardrop pendants with one side flattened were perforated by mandrel piercing. They are made of transparent (Figure 4, 11.3) or translucent dark blue glass (Figure 4, 12.4), and were found in tombs dated to the 5th-6th centuries. Additionally, one such pendant (Figure 8, 34.3) was threaded together with six other irregularly shaped dark blue pendants in a necklace found in a tomb dating to the 6th-7th centuries at Matmar. The irregularly shaped pendants have a tabular shape and rounded or tapered bases (Figure 8, 34.1). In general, blue glass teardrop pendants with rounded bases are found in




45. UC 59787




46. E.86.1931




48. ÄS 3355


49. EA62600


50. EA62601


47. UC 59784

**Figure 12.** Matmar objects 45-47, 7th-8th centuries.

**Figure 13.** Matmar and Mostagedda objects 48-50, 7th-8th centuries.

assemblages of the early and late Roman periods, and are known to have been produced locally (Arveiller-Dulong and Nenna 2011:188, cat. 232). Their use, however, does not seem to have been restricted to Egypt alone, as one example was found in a tumulus tomb dated to the 5th-6th centuries at El-Zuma in Nubia (Then-Obłuska 2017b: Figure 3).

Another type frequently encountered in tombs of the 5th-8th centuries, predominantly at Matmar, was made by mandrel piercing and marvering a green glass strip with a yellow cap into a biconical or globular shape (Figure 4, 15.5; Figure 5, 18.4; Figure 7, 29.6, 31.5; Figure 10, 39.2; Figure 15, 55.11) or a long conical shape (Figure 5, 18.2, 20.1, 20.6 [probably a fragment]; Figure 7, 31.3, 31.6 [probably an unfinished 31.3 bead]; Figure 8, 33.4; Figure 11, 43.13; Figure 13, 48.1) (Meyer 2014:83, Plate 34b, green "date" bead with one yellow cap).

Examples of opaque yellow and translucent colorless striped glass (Figure 4, 12.1, 15.2; Figure 5, 18.13; Figure 7, 29.3; Figure 9, 37.5; Figure 10, 39.4), as well as translucent green and opaque yellow striped glass (Figure 4, 12.3, 15.4; Figure 7, 29.1), were most probably mandrel pierced and marvered to form a slightly biconical bead. This type also presents slight variations, another example having yellow and red stripes (Figure 9, 37.16). All striped glass bicones are from tombs dating to the 5th-7th centuries and have parallels of similar chronology. For example, a yellow and colorless striped mosaic bicone was recorded at the Byzantine site of Bir Umm Fawakhir in the central Eastern Desert of Egypt (Meyer 2014:83, Figure 40 l, Plate 34c; 5th-6th centuries).

A piece of semi-translucent green glass was mandrel pierced and decorated with sections of mosaic eye canes. The eyes are red spots encircled by yellow rings (Figure 13, 50.9). The example comes from a tomb dated to the 7th-8th centuries, which also yielded green glass cane beads covered either with stripes of yellow, red, white, and green (Figure 13, 50.8, 50.11?, 50.12?) or yellow, black, and white (Figure 13, 50.10).

### *Mandrel-Pierced and Folded Glass*

Traces of a seam which indicate a folding over of the glass after piercing can be discerned on a group of conical opaque green beads found in tombs of the 6th-7th centuries (Figure 7, 30.1). Some of them are tabular (Figure 7, 30.2, 31.4).

A mosaic-glass bead with a yellow center and radial petals in black and white from a tomb of the 5th-6th centuries (Figure 5, 18.11) was most probably mandrel-pierced. Similar examples have been found at Kertch on the Black Sea in layers dating to the 2nd-4th centuries (Arveiller-Dulong and Nenna 2011:162, cat. 206: 16 and 18).

Opaque yellow and translucent green striped glass with a yellow cap at one end was pierced and folded around the mandrel to form long conical beads (Figure 4, 15.1; Figure 5, 18.9; Figure 7, 29.2; Figure 9, 37.11). This type is present in tombs dating to the 5th-7th centuries.

### *Mandrel-Formed Glass*

The exact technique of manufacture of several mandrel-formed beads – whether winding, folding, or rod piercing and folding – remains uncertain. Many of them were marvered on a flat plate to impart facets. One of these beads is a long cylinder of translucent dark blue glass that is ca. 20 mm long (Figure 12, 46.9). Others include long hexagonal cylinders of opaque dark blue glass about 5 mm in diameter (Figure 4, 12.5; Figure 7, 29.5). Some hexagonal cylinders of opaque blue (Figure 5, 17.5) and opaque green (Figure 5, 17.3; Figure 6, 23.5; Figure 8, 33.3) glass are much larger, measuring about 10 mm in diameter. A similar example from the MET collection, presumably from Egypt, dates to the 3rd-4th centuries (MET 10.130.3154). Longer versions of hexagonal cylinders are also present. They are made of translucent dark green glass (Figure 12, 47.5) and measure about 6 mm in diameter and 10 mm in length.

A long rectangular bicone is made of semi-translucent blue glass (Figure 11, 42.12). Long hexagonal bicones of translucent dark blue glass measure about 15 mm and 20 mm in length (Figure 7, 29.8; Figure 13, 48.3).

Some faceted beads of dark blue glass are in the form of cornerless cubes (Figure 4, 16.2; Figure 5, 17.4, 18.8; Figure 6, 25.1; Figure 8, 32.6, 34.2; Figure 10, 39.3, 40.3), one of which was longer than the rest (Figure 11, 44.13). Some beads bear traces of seams indicating that they may have been pierced and folded around the mandrel before being marvered into shape. They are from tombs dated to the 5-6th centuries but continued to be placed in burials in the 7th-8th centuries.

A phallic pendant found in a tomb dated to the 6th-7th centuries was most probably formed on a mandrel using light blue glass with a red and amber trail. Two eyes with red centers and yellow borders were applied (Figure 7, 28.2). It is probably a reused Roman amulet (*see* Spaer 2001, cat. 426 for phallus amulet and references).

The technique of production of three other mandrel-formed examples could not be identified. These are a large cylindrical green bead (Figure 8, 33.5), an almond-shaped


**Figure 14.** Matmar and Mostagedda objects 51-54, 7th-8th centuries.

**Figure 15.** Mostagedda objects 55-58, 7th-early 9th centuries.

bead (Figure 8, 34.7), and a blue toggle-shaped, rather misshapen, bead (Figure 8, 34.6). All were found in tombs dated to the 6th-7th centuries. One last notable example of this group is a bead made of white glass covered with a thin translucent blue layer (Figure 15, 58.20).

### Metal

Only a few metal beads and pendants appear in the corpus. These are long beads of folded sheet metal (Figure 4, 13.5), a copper-alloy coin perforated for suspension (Figure 13, 48.9), a cross with long simple arms and provided with a suspension loop (Figure 11, 42.13), and a metal plaque pendant in the shape of a leaf or teardrop with a protruding suspension loop (Figure 10, 41.5). The coin was minted in Alexandria under the reign of Claudius (RPC I, 5175) and displays a caduceus between ears of grain and the legend AYTO-KPA on its reverse (Dr. Piotr Jaworski 2019: pers. comm.). The cross and coin were found in tombs dating to 7th-8th centuries; the leaf plaque was in a tomb dated to the 6th-8th centuries.

## DISCUSSION AND CONCLUSIONS

By combining the dating of the Matmar and Mostagedda tombs with evidence of analogous beads published thus far, it is possible to provide a chronological overview of the use of bead and pendant types at the sites and, for a part of them, indicate their provenience.

Objects 1 to 6 (Figure 2) belong to the early Roman tradition and are datable to the 1st-3rd centuries. They include Red Sea mollusc shells, Mediterranean coral beads, and stone beads of Eastern Desert or Indian origin. The bead types encountered during this period are small ellipsoid carnelians, short biconical carnelians and amethysts, as well as agate barrels of red or black/brown and white color, the latter also imitated in black and white folded glass. Besides Egyptian monochrome drawn glass beads, gold-in-glass and silver-in-glass specimens are also present, as are wound blue beads with applied stratified eyes.

Analysis of the bead typology also enables a discussion about the proposed chronology of two tombs of this period. The tomb that objects 3 and 4 come from is dated to the 3rd-4th centuries, whereas parallels for stone beads that are included in the bead objects found there point to their being produced some time between the 1st century BC and the 1st century AD. How long were individual beads in use before being threaded together and placed in graves is not possible to ascertain, yet the much earlier dating of a considerable part of the bead types in objects 3 and 4 suggests that an earlier dating of the associated tomb is not improbable.

Similarly, objects 5 and 6 are from a tomb datable to the 3rd-4th centuries, but parallels with known dated bead types suggest that these objects may not have been produced later than the 3rd century. Although generally in line with the dating of the tomb, the timeline of these bead types suggests that a slightly earlier or tighter chronology for the burial is possible.

Objects 7 to 23 (Figures 3-6) are associated with the late Roman period (4th-6th centuries). Whereas beads made of Mediterranean coral and perforated Red Sea shells were also manufactured in earlier times, a number of new types (such as the perforated Mediterranean mollusc shells, a few wooden beads, bone pendants, as well as amber beads most probably of Baltic Sea origin) appear in the archaeological record from this time onward. Large beads of green stone, which was most probably procured in the Eastern Desert, were often imitated in faceted glass.

Drawn and segmented glass and metal-in-glass beads are of oblate and ribbed shapes. Some gold-in-glass double segments are characterized by wide interspaces. Some other new types include cornerless cubes, teardrop pendants with one flat side, so-called "date" beads (with yellow caps) in many variants, as well as striped bichrome bicones. During this period the Indo-Pacific drawn and rounded beads (here green in color), of South Indian/Sri Lankan origin, also make their way into the record. Eye beads made of mosaic glass with yellow centers and radial petals in black and white start being used around this time as well.

A few types, including beads of Baltic Sea amber, beads and pendants of Mediterranean coral, and pendants of marine mollusc shell of both Mediterranean and Red Sea (*Conus taeniatus*) provenience, continued to be used at Matmar and Mostagedda throughout the 6th and 7th centuries (objects 26-40; Figures 6-10). New types that appear during this time include nacre pendants, dentalium beads, large beads of pale amethyst, and long carnelian bicones. The latter, however, are also well known from earlier Nubian and Egyptian assemblages of the 4th-6th centuries (e.g., Then-Obłuska 2018b).

A feature of this period is the abundance of "date" beads, most of which are green with yellow caps. Other types include simple, translucent dark green segmented beads, both drawn and wound, and metal-in-glass beads. Among the latter are a few with translucent golden-yellow layers. Other beads are dark blue cornerless cubes and long cylinders, some faceted ones, and long faceted bicones. A few folded-glass beads are black with a central white band. As for glass pendants, new types are the dark blue irregular teardrops and what is probably a reused Roman phallus pendant.

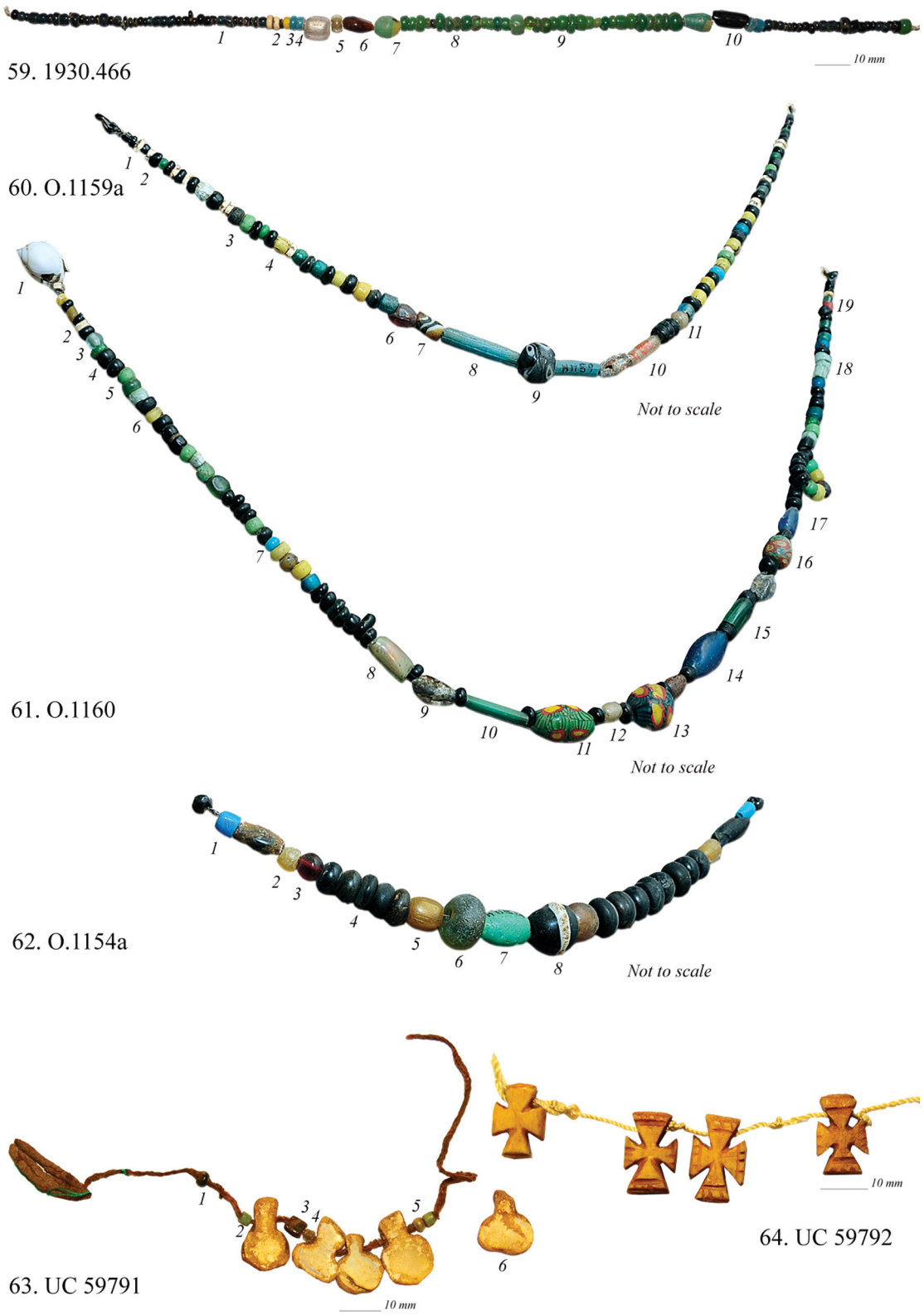



**Figure 16.** Matmar and Mostagedda objects 59-64, 7th-early 9th centuries; original stringing: 63 (16.60, 61, 62 courtesy of The National Museum, Bloemfontein, South Africa).

Amber and coral beads, mollusc-shell pendants, pale amethyst beads, and faceted long carnelians continued to be used at Matmar and Mostagedda during the 7th and 8th centuries (objects 42-57; Figures 11-15). Notable for this period is the introduction of a diversity of pendants of amber, bone, and wood. Monochrome drawn and wound beads dominate the glass bead assemblage. New types include large beads made of polychrome glass: wound black beads with a trailed white line, beads of striped drawn glass, folded banded glass, and mosaic eye beads. The presence of cross pendants of metal (object 42) and bone (object 48) is also notable.

As in the case of objects 3 and 4, the production timeline of a series of known bead types does not fully agree with the revised tomb chronology. Divergences between the two timelines exist with respect to two objects (nos. 58-59; Figures 15-16) that come from a tomb attributed to the period between the 7th and the beginning of the 9th centuries. Scandinavian and Baltic parallels for types of mosaic eye beads with radial designs included in these objects indicate that these bead types were produced from the mid-8th to the beginning of 9th centuries. This suggests that the tomb more likely dates to the late 8th to mid-9th centuries. A later date is also supported by parallels on site. Object 61, found in a tomb dated to the 8th-early 9th centuries, incorporates a mosaic eye bead design similar to those included in object 58.

Object 62 (Figure 16) was found in a tomb tentatively dated to the 5th-8th centuries. A parallel for a bead type (44.4) suggests a tighter date for the tomb in the 7th or 8th century. Two other objects could not be provenienced nor dated (nos. 63, 64; Figure 16), but several analogous pieces on site hint to a possible chronology. The decontextualized necklace with nacre pendants (no. 63.6) is similar to a group of beads that share the same nacre type as no. 29.7 from a tomb dated to the 6th-7th centuries. Four bone-plaque cross pendants restrung in modern times (no. 64) resemble a bone cross with a different decoration and type of suspension (no. 48.6) from a tomb dated to the 7th-8th centuries.

To conclude, with few exceptions, the recently revised chronological time frame of the Matmar and Mostagedda Ptolemaic to early Arab necropolises largely agrees with the known chronology of bead types found at the two sites, evidenced through the analogous examples discussed above. Judging from the diversity of types, it is likely that the inhabitants who buried their dead at the two sites had access to a wide array of beads and bead materials at local markets. They used an extensive range of types that were traded along the routes of the Nile Valley, and stretched further away along the Mediterranean and Red Sea coasts, toward northern Europe and South Asia.

**ACKNOWLEDGEMENTS**

Joanna Then-Obłuska would like to thank Dr. Piotr Jaworski of The University of Warsaw for identifying the perforated coin no. 48.9. Her gratitude goes to Dr. Marilee Wood for sharing her knowledge and bibliography regarding Islamic beads, to Prof. James A. Harrell for his invaluable comments on stone identification and provenience, and to Karlis Karklins and Dr. Lisa A. Heidorn for editing this paper. The following institutions have kindly allowed the publication of photographs: Staatliches Museum für Ägyptischer Kunst, Munich; The Ashmolean Museum, University of Oxford; The Petrie Museum of Egyptian Archaeology, University College London; The British Museum; The Fitzwilliam Museum, University of Cambridge; The National Museum, Bloemfontein.

**ENDNOTES**

1. For more information about Brunton's excavation methods, *see* Pleşa (2017b).

2. The results of the radiocarbon dating of 20 textile samples are not yet published, but short references to these may be found in Pleşa (2017a).

3. The British Museum, London (EA) (n=16), The Petrie Museum of Egyptian Archaeology, University College London (UC) (n=17), The Ashmolean Museum, University of Oxford (n=6), The Fitzwilliam Museum, University of Cambridge (E) (n=4), Staatliches Museum für Ägyptischer Kunst, Munich (ÄS) (n=16), and The National Museum, Bloemfontein, South Africa (O) (n=4).

4. Matmar: Tombs 601, 615, 623, 801, 802, 812, 824, 825, 829, 831, 832, 834, 843, 853, 855, 862, 873, 874, 885, 1013, 1027, 1033, 1035, 1038, 1040, 1045, 1053, 1060, 1068, 1080, 1101, 1102, and 1301. Mostagedda: Tombs 573, 574, 576, 577, 588, 1104, possibly 1407, 1411, 1429, 1441, and 1844.

5. Two objects (63: UC 59791, 64: UC 59792) could not be properly redated because they are decontextualized.

6. Many additional bead fragments are not illustrated.

7. Tomb 831 yielded a Theodosian coin (VICTORIA AVGG; Victory I) datable to the last two decades of the 4th century (Brunton 1948:95).

8. Two textiles from Tomb 1013 yielded two radiocarbon dates, one spanning the period from the 2nd decade of

the 5th century to the middle of the 6th century; the other from the middle of the 6th century to the middle of the 7th century (Pleşa 2019b).

9. Such patterned beads are presented together (MET 10.130.3288) with another type having a white center with dark pupil, bordered with a red and yellow ring and radial stripes in translucent dark green and opaque yellow. They are dated to the 8th-9th centuries (Wood 2018: Figure 1 C, H, I) or to the second quarter and middle of the 9th century (Callmer 1997:199, Plate 16, C8, 2003:42, Figure 4.2, C8).

## REFERENCES CITED

**Alekseeva, Ekaterina M.**
1975 *Antičnye busy severnogo Pričernomor'ja* I (*Ancient Beads of the Northern Black Sea* I). Nauka, Moscow (in Russian).

**Arveiller-Dulong, Véronique and Marie-Dominique Nenna**
2011 *Les verres antiques du Musée du Louvre III. Parures, instruments et éléments d'incrustation*. Musée du Louvre, Paris.

**Beck, Horace C.**
1928 Classification and Nomenclature of Beads and Pendants. *Archaeologia* 77:1-76.
1941 *The Beads from Taxila*. Manager of Publications, Delhi.

**Brugmann, Birte**
2004 *Glass Beads from Early Anglo-Saxon Graves*. Oxbow Books, Oxford.

**Brunton, Guy**
1937 *Mostagedda and the Tasian Culture*. Bernard Quaritsch, London.
1948 *Matmar: British Museum Expedition to Middle Egypt; 1929-1931*. Bernard Quaritsch, London.

**Callmer, Johan**
1997 Beads and Bead Production in Scandinavia and the Baltic Region c. AD 600-1100: A General Outline. In *Perlen: Archäologie, Techniken, Analysen*, edited by Uta von Freeden and Alfred Wieczorek, pp. 197-202. *Kolloquien zur Vor- und Frühgeschichte* 1.
2003 Beads in Scandinavia in the Early and High Medieval Periods, ca. AD 400-1200. In *Ornaments from the Past: Bead Studies after Beck*, edited by I. Glover, H. Hughes-Brock, and J. Henderson, pp. 38-46. The Bead Study Trust, London.

**Drauschke, Jörg**
2010 Byzantine Jewellery? Amethyst Beads in East and West during the Early Byzantine Period. In *Intelligible Beauty, Recent Research on Byzantine Jewellery*, edited by Chris Entwistle and Noël Adams, pp. 50-60. British Museum Research Publication 178.

**Dubin, Lois Sherr**
2009 *The History of Beads: From 100,000 B.C. to the Present, Revised and Expanded Edition*. Abrams, New York.

**Dunham, Dows**
1963 *The Royal Cemeteries of Kush V: The West and South Cemeteries at Meroë*. Museum of Fine Arts, Boston.

**Eger, Christoph and Lutfi A. Khalil**
2013 Bead Jewellery of Late-Roman and Byzantine Time in the Province of Arabia: The Beads and Pendants of Glass, Stone, and Organic Materials from the Rock Chamber Necropolis at Khirbat Yajuz, Jordan. *Zeitschrift für Orient-Archäologie* 6:156-181.

**Francis, Peter, Jr.**
2002 *Asia's Maritime Bead Trade: 300 B.C. to the Present*. University of Hawai'i Press, Honolulu.

**Gan, F., C. Huangsheng, H. Yongqing, M. Bo, and G. Donghong**
2009 Study of the Earliest Eye Beads in China Unearthed from the Xu Jialing Tomb in Xichuan of Henan Province. In *Ancient Glass Research along the Silk Road*, edited by F. Gan, Robert H. Brill, and S. Tian, pp. 457-470. World Scientific, Hackensack, NJ.

**Haerinck, Ernie**
2001 *Excavations at ed-Dur (Umm al-Qaiwain, United Arab Emirates) II. The Tombs*. Peeters, Leuven.

**Hamilton-Dyer, Sheila**
2001 Objects of Bone, Horn and Shell. In *Mons Claudianus: Survey and Excavation, 1987-1993, II.1. Excavations*, edited by Valerie A. Maxfield and David P.S. Peacock, pp. 356-368. Fouilles de l'Ifao 43.
2007 Worked Bone, Ivory and Shell. In *The Roman Imperial Quarries: Survey and Excavation at Mons Porphyrites, 1994-1998, II. The Excavations*, edited by David Peacock and Valerie A. Maxfield, pp. 337-354. Egypt Exploration Society Memoirs 82.

**Harrell, James A.**
2012 Gemstones. In *UCLA Encyclopedia of Egyptology*, edited by Willeke Wendrich. UCLA, Los Angeles; http://digital2.library.ucla.edu/viewItem.do?ark=21198/zz002czx1r.

**Harrell, James A. and Steven E. Sidebotham**
2004 Wadi Abu Diyeiba – An Amethyst Quarry in Egypt's Eastern Desert. *Minerva* 15(6):12-14.

**Harrell, James A., Steven E. Sidebotham, Roger S. Bagnall, Sylvie Marchand, Jennifer E. Gates, and Jean-Louis Rivard**
2006 The Ptolemaic to Early Roman Amethyst Quarry at Abu Diyeiba in Egypt's Eastern Desert. *Bulletin de l'Institut Francais d'Archéologie Orientale* 106:127-162.

**Koch, Ursula**
1987 *Der Runde Berg bei Urach VI. Die Glas- und Edelsteinfunde aus den Plangrabungen 1967-1983*. Jan Thorbecke, Sigmaringen.

**Lankton, James W.**
2003 *A Bead Timeline, Volume I: Prehistory to 1200 CE*. The Bead Society of Greater Washington, Washington, DC.

**Lin, Yixian**
2010 A Scientific Study of Glass Finds from the Niya Oasis. In *Glass along the Silk Road: from 200 BC to AD 1000. International Conference within the Scope of the "Sino-German Project on Cultural Heritage Preservation" of the RGZM and the Shaanxi Provincial Institute of Archaeology, December 11th-12th 2008*, edited by Bettina Zorn and Alexandra Hilgner, pp. 203-210. Verlag des Römisch-Germanischen Zentralmuseums, Tagungen 9.

**Liu, S., Q.H. Li, F. Gan, P. Zhang, and James W. Lankton**
2012 Silk Road Glass in Xinjiang, China: Chemical Compositional Analysis and Interpretation Using a High-Resolution Portable XRF Spectrometer. *Journal of Archaeological Science* 39(7):2128-2142.

**Meyer, Carol**
2014 Dipinti, Coins, and Small Finds. In *Bir Umm Fawakhir III. Excavations 1999-2001*, edited by Carol Meyer, pp. 77-90. Oriental Institute Publications 141.

**Pleşa, Alexandra D.**
2017a Religious Belief in Burial: Funerary Dress and Practice at the Late Antique and Early Islamic Cemeteries at Matmar and Mostagedda, Egypt (Late Fourth - Early Ninth Century CE). *Ars Orientalis* 47:18-42.
2017b The Late Antique and Early Islamic Necropolises at Matmar and Mostagedda, Middle Egypt. A Reassessment of the Excavation and Present State of the Collection. In *Proceedings of the 6th Conference of the Research Group "Textiles From the Nile Valley," Antwerp, 27-29 November 2015*, edited by Antoine De Moor, Caecilia Flück, and Petra Linscheid, pp. 68-83. Lannoo, Tielt, Belgium.
2020 People and Their Dress in Late Antique and Early Islamic Egypt: Agency, Community, Religion, and the Fashionable. Ph.D. thesis. Vrije Universiteit Amsterdam (forthcoming).

**Spaer, Maud**
1993 Gold-Glass Beads: A Review of the Evidence. *Beads: Journal of the Society of Bead Researchers* 5:9-25.
2001 *Ancient Glass in the Israel Museum: Beads and Other Small Objects*. The Israel Museum, Jerusalem.

**Then-Obłuska, Joanna**
2015 Cross-Cultural Bead Encounters at the Red Sea Port Site of Berenike, Egypt, Preliminary Assessment (Seasons 2009-2012). *Polish Archaeology in the Mediterranean* 24(1):735-777; https://www.academia.edu/28331445/.
2016a Beads and Pendants from the Tumuli Cemeteries at Wadi Qitna and Kalabsha-South, Nubia. *Beads: Journal of the Society of Bead Researchers* 28:38-49; https://www.academia.edu/31028281/.
2016b Meroitic Beadwork: An Overview Based on Finds from Saï in Ancient Nubia. *Polish Archaeology in the Mediterranean* 25:691-724; https://www.academia.edu/33695935/.
2016c Trade and Faith in Nubian Early Makuria (AD 450-550): Macroscopic Examination of Personal Adornments from El-Zuma in Nubia. *Polish Archaeology in the Mediterranean* 25:741-760; https://www.academia.edu/33494802/.
2017a Between the Nile and the Ocean. The Bead Assemblage from Shenshef in the Eastern Desert (4th-6th Centuries AD). *Polish Archaeology in the Mediterranean* 26(1):719-747; https://www.academia.edu/37284553/.
2017b Royal Ornaments of a Late Antique African Kingdom, Early Makuria, Nubia (AD 450-550), Early Makuria Research Project. *Polish Archaeology in the Mediterranean* 26(1):687-718; https://www.academia.edu/37284552/.
2018a Beads and Pendants from the Hellenistic to Early Byzantine Red Sea Port of Berenike, Egypt: Seasons 2014 and 2015. *Polish Archaeology in the Mediterranean* 27(1):203-233; https://www.academia.edu/40153375/.
2018b Short and Long-Distance Contacts of Late Antique Nubia: A View through the Bead Hole. In *Nubian Archaeology in the XXIst Century, Proceedings of the Thirteenth International Conference for Nubian Studies (Neuchâtel, 1-6 September 2014), Collection « Orientalia Lovaniensia Analecta »*, edited by Matthieu Honegger, pp. 587-595. Peeters Editions, Leuven; https://www.academia.edu/37620165/.
2019a Bead Trade in Roman Ports – A View from the Red Sea Port Marsa Nakari. In *Stories of Globalisation: The Red Sea and the Persian Gulf from Late Prehistory to Early Modernity. Selected Papers of Red Sea Project VII*, edited by Andrea Manzo, Chiara Zazzaro, and Diana Joyce de Falco, pp. 264-280. Brill, Leiden.

2019b Beads and Pendants from Mons Smaragdus Mining Settlement at Sikait, Egypt (manuscript in preparation).

2019c Indian Glass Beads in Northeast Africa between the 1st and 6th Centuries AD. In *Glass of South & South-East Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kanungo (forthcoming).

**Then-Obłuska, Joanna and Laure Dussubieux**

2016 Glass Bead Trade in the Early Roman and Mamluk Quseir Ports – A View from the Oriental Institute Museum Assemblage. *Archaeological Research in Asia* 6:81-103.

**Then-Obłuska, Joanna and Barbara Wagner**

2019 Glass Beads and Pendants from Meroitic and Nobadian Lower Nubia, Sudan: Chemical Compositional Analysis Using Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry. *Archaeometry* 61(4):856-873.

**Then-Obłuska, Joanna with Barbara Wagner**

2019 *Glass Bead Trade in Northeast Africa. The Evidence from Meroitic and Post-Meroitic Nubia*. PAM Monograph Series 10. University of Warsaw Press, Warsaw.

**Wood, Marilee**

2018 How Small the World, Intercontinental Trade in the 8th to 9th Century CE Illuminated by a Handful of Glass Beads. In *The Resilience of Heritage: Cultivating a Future of the Past. Essays in Honour of Professor Paul J.J. Sinclair*, edited by Anneli Ekblom, Christian Isendahl, and Karl-Johan Lindholm, pp. 307-322. Uppsala University, Uppsala.

**Xia, Nai**

2014 *Ancient Egyptian Beads*. Springer, Heidelberg.

Joanna Then-Obłuska
Antiquity of Southeastern Europe Research Centre
University of Warsaw
Warsaw
Poland
j.then-obluska@uw.edu.pl

Alexandra Pleșa
Department of Art & Culture, History, and Antiquity
Vrije Universiteit Amsterdam
Amsterdam
Netherlands
plesa.alexandra@gmail.com