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Research Article

Roman Glass Artefacts from the Northern Necropolis of Aizanoi (2012-2017): An Assessment in Social and Economic Context

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Abstract

Glass artefacts are frequently uncovered in Roman grave excavations, providing significant insights into the social and funerary practices of that era. These artefacts exhibit a diverse array of styles and forms, reflecting the variety of funeral customs and traditions. When examining glass artefacts from an archaeological perspective, necropoleis emerge as fruitful sources of material for typological and chronological studies. This is primarily due to the fact that necropoleis often yield intact artefact groups that facilitate such investigations. Therefore, both research areas engage in a mutually beneficial exchange of information pertinent to archaeology. The necropoleis in Aizanoi, along with the artefacts unearthed within them, contribute significantly to the study of ancient glass and facilitate sociological evaluations based on these findings. This study aims to elucidate the economic and social stratification of the inhabitants of Aizanoi as reflected in their burial customs, with a focus on analysing archaeological glass materials. The Northern Necropolis, recognized for its concentration of glass artefacts within the ancient city, serves as the primary site of investigation for this research. Although the earliest examples identified in this area date to the Hellenistic period, the majority of artefacts can be attributed to the Roman Imperial period. In this regard, particularly concerning the Roman Imperial period, our study will contribute to the delineation of the geographical boundaries within which the city engaged in socio-cultural exchange. This will be achieved by revealing various forms of locally or regionally produced groups, as well as identifying certain groups of imported vessels.

Keywords: Aizanoi, Phrygia, Necropolis, Glass unguentarium, Roman glass, Roman Imperial period.

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Araştırma Makalesi

Aizanoi Kuzey Nekropolisi'nde Bulunan Roma İmparatorluk Dönemi'ne Ait Cam Eserler (2012-2017): Sosyal ve Ekonomik Bağlamda Bir Değerlendirme

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Çıkar Çatışması Beyanı: Çıkar çatışması beyan edilmemiştir.

Öz

Özellikle Roma İmparatorluk Dönemi'ne tarihlenen mezarlarda yürütülen arkeolojik kazılarda sıkça karşılaşılan cam buluntular, cenaze uygulamaları ve gömü adetleri bağlamında değerlendirildiğinde hem dönemin sosyal hayatını hem de bu hayatın bir parçası olan yerel gömü geleneklerini dönemsel çeşitliliği ile sunan başlıca buluntu gruplarındandır. Nekropollerde tespit edilen cam eserler sıklıkla tüm durumda ele geçtiklerinden, tipolojik ve kronolojik değerlendirmelere en çok olanak sağlayan arkeolojik buluntu gruplarından birini oluşturur. Dolayısıyla nekropol ve cam çalışmaları karşılıklı olarak birbirini beslemektedir. Aizanoi antik kenti nekropolleri ve bu nekropollerde ele geçen buluntular cam çalışmalarına ve bu çalışmalar ile ulaşılan sosyolojik değerlendirmelere büyük oranda yardımcı olacaktır. Bu çalışma, Aizanoi antik kentinde yaşayan halkın ölü gömme gelenekleri bağlamında değerlendirildiğinde, bu halkın ekonomik ve dolayısıyla sosyal tabakalaşmasının hatlarını arkeolojik cam malzemeyi odak noktaya koyarak çizmeyi amaçlamaktadır. Antik kentin tamamında en fazla cam eserin bulunduğu sektörlerden biri olan Kuzey Nekropolis çalışmamızın ana buluntu grubunun geliş yerini oluşturmaktadır. Bu alanda en erken örnekler Hellenistik Dönem'e tarihlenmekte ise de buluntuların çoğunluğu Roma İmparatorluk Dönemi'ne aittir. Bu anlamda, özellikle Roma İmparatorluk Dönemi için değerlendirildiğinde, çalışmamız yerel ya da bölgesel üretim olasılığı taşıyan kimi form gruplarını ortaya çıkardığı gibi, bazı ithal özellik taşıyan kap gruplarını tespit ederek kentin sosyo-kültürel alışveriş içerisinde olduğu coğrafi hattı belirlemeye de katkı sağlayacaktır.

Anahtar Kelimeler: Aizanoi, Phrygia, Nekropolis, Cam unguentarium, Roma camı, Roma İmparatorluk Dönemi.

Introduction

Grave finds can be categorized not only as the personal belongings of the deceased but also as grave goods that indicate social and political status, or as ritual items that reflect the cult of the dead during the period in question. Glass artefacts are commonly discovered in Roman grave excavations, offering valuable insights into the social and burial practices of that time period. These artefacts demonstrate a wide range of styles and forms, reflecting the diversity of funeral customs and traditions. When analysing glass artefacts from an archaeological perspective, necropoleis emerge as a particularly fruitful source of material for typological and chronological studies. This is largely due to the fact that necropoleis often yield intact artefacts groups that facilitate such investigations. Necropoleis associated with ancient cities such as Aizanoi, where comprehensive anthropological studies have been conducted, grave inscription analyses have been performed, and burial customs have been extensively examined by experts, are of paramount importance to our research due to the data they provide that supports studies on glass.

As previously indicated, necropoleis represent the most predominant excavation sites where glass artefacts are unearthed in various states of preservation, particularly during the Roman Imperial period. This prevalence is correlated with the widespread adoption of the free-blown glass technique, which emerged concurrently with the discovery of the blowing technique. Necropoleis such as the Northern Necropolis of Aizanoi, which also feature Hellenistic glass artefacts, hold even greater scholarly significance. Hellenistic period glass vessels, which are comparatively rare in relation to those from the Roman Imperial period, provide a valuable opportunity for comparative analysis between these periods, particularly regarding typological changes in specific forms and the evolution of construction and decorative techniques, akin to that observed in pottery vases.

The distinctions between the necropoleis artefacts and those associated with civil architecture merit consideration. Although necropolis finds are directly associated with the daily life of the deceased, particularly in the context of grave goods, it is important to note that these finds do not exclusively belong to the category "funerary gifts". At each stage of the burial ritual, the content and significance of that stage vary; consequently, the forms, dimensions, decorations, and technical characteristics of the objects utilized also differ. Conversely, the diversity of material culture associated with life is inherently more complex than that associated with death. Consequently, the extensive diversity of forms associated with the utilization of glass artefacts, which are integral to daily life, is not unexpected. This diversity further elucidates the presence of certain glass groups in both funerary contexts and residential environments. The prevalence of this similarity predominantly during the Roman Imperial period can be effectively attributed to advancements in glass technology and the unprecedented widespread utilization of glass during this era.

Situated in the Central Western Anatolia, 48 kilometers southwest of Kütahya province and within the boundaries of Çavdarhisar district, Aizanoi was established in the Phrygia Epiktetos along the Penkalas Branch of the Rhyndakos River in antiquity. Strabo, a 1st-century AD geographer, enumerated the settlements within the region of Phrygia Epiktetos, stating: "*Aizanoi, Nakoleia, Kotiaion, Midaeion, and Dorylaion are the cities of Phrygia Epiktetos; Kadoi, which according to certain authors is regarded as belonging to Mysia, is also included among them*"[1]. Excavations on the mound supporting the Temple of Zeus have shown that the settlement within the city territory dates back to the early third millennium

[1] Strab. 12, 8, 12.

BC[2]. The city's most significant period occurred during the Roman Imperial period, particularly under the reign of Emperor Hadrian and throughout the Antonine period. During this time, the city underwent a transformation into a settlement characterized by heightened construction activities and substantial immigration, which contributed to its cosmopolitan development[3]. During the Early Byzantine period, the city evolved into a prominent bishopric centre, sending its bishops to various other cities[4]. The city, which remained significant until the 8th century AD, was designated as a UNESCO World Heritage Site on April 12, 2012, and is included on the Tentative List of Cultural Heritage[5].

The excavations conducted within the city have shown the existence of various designated areas for cemeteries both in and around the urban centre, revealing the practice of distinct burial traditions across these regions. These areas include the Northern Necropolis, which serves as the primary focus of this study, as well as the Southern, Eastern (Yalakkaya Mevkii), and Western Necropoleis. Based on existing research, it can be posited that the Northern Necropolis was utilized beginning in the Hellenistic period, with a marked intensification of its use occurring during the Roman Imperial period[6].

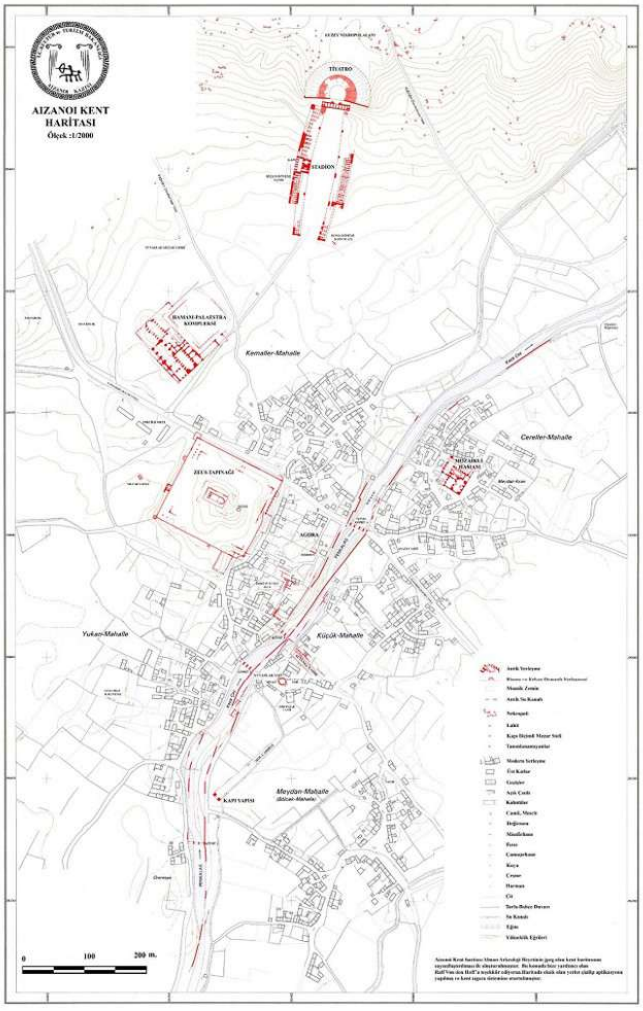

Figure 1: The city plan of Aizanoi *(2011-2020 Aizanoi Excavation Archive)*

[2] Lochner and Ay 2001, 269-294.
[3] Özer et al. 2022, 85.
[4] Belke and Mersich 1990, 202.
[5] Özer et al. 2022, 86.
[6] Özer and Doksanaltı 2017, 288.

The Northern Necropolis of Aizanoi

The Northern Necropolis of Aizanoi is located in proximity to the theatre, at an elevation of 1,020 meters above sea level. Glass artefacts were identified in the majority of the grave structures within this burial site. More than 100 graves were identified during the excavations conducted between 2012-2017. Archaeological studies suggest that the earliest burials in the Northern Necropolis commenced in the late 2nd century BC, reached a peak during the 1st century BC and the 1st century AD, and persisted, albeit with reduced frequency, until the 3rd century AD. These burial types can be classified into two categories: inhumation and cremation. Inhumation burials emerged as the prevailing norm, originating in the middle of the 1st century AD and experiencing gradual growth in popularity. Conversely, the cremation tradition appears to have been abandoned during the same period. The impact of Hadrian's 2nd century AD legislation prohibiting cremation burials within a radius of 3 kilometres from the city walls warrants careful consideration[7].

Initiated in 2015, "Aizanoi Glass Project"[8], has demonstrated that the city holds significant importance for ancient glass studies, particularly due to the qualitative and quantitative contributions provided by the Northern Necropolis.

In this study, a total of 50 glass vessel fragments, 6 complete vessels, 5 beads, and 1 possible amulet excavated during the fieldwork conducted between 2012 and 2017, were analysed primarily to ascertain their technical characteristics. The vessels associated with certain fragments were identifiable, allowing for their collective organization during the cataloguing phase. Furthermore, the contextual connections between these artefacts and the graves in which they were found were examined. These relationships encompassed various factors such as the deceased's sex, age, and social status, as well as the correlation between grave or burial types and the presence of these artefacts. The study also aimed to decipher the significance of the artefacts' placement inside or outside the grave, if ascertainable, and to draw parallels with contemporary traditions and intended use[9].

Firstly, the date range of the artefacts indicates that they belong to the Early and Middle Roman Imperial period, with the exception of one example[10] (fig. 4.5). Except for this specific example, all other vessel instances were created using the free-blowing technique.

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[7] Lindsay 2000, 170.

[8] The "Aizanoi Glass Project", which spanned the years 2012 to 2017, encompasses the documentation and typological evaluation of all glass artefacts identified from the initial excavations of the city up to 2017. As part of the documentation study, these glass artefacts were entered into the "Aizanoi Glass Database", which was further enriched through drawing and photographic processes. Permission to conduct this work was granted by Prof. Dr. Elif Özer. The digital drawings of the glass artefacts from the Northern Necropolis were executed under the project titled "Aizanoi Northern Necropolis Glass Finds," which received support from the Karabük University Scientific Research Projects Coordination Office, designated by the number KBÜBAP-24-DS-048

[9] The anthropological data utilized in this study was obtained orally from Prof. Dr. Handan Üstündağ and is derived from Prof. Üstündağ's 2019 research (Üstündağ 2019, 311-330).

[10] This example was produced using 'Core Forming,' which is recognized as the earliest known technique for the production of glass vases. The earliest glass vessels emerged in Mesopotamia and Egypt during the second half of the 2nd Millennium BC (16th–15th centuries BC). These initial glass vessels were produced utilizing the Core Forming Technique, which originated in Western Asia and Egypt and experienced a revival in Mesopotamia during the Early Iron Age (Oikonomou 2018, 513). It is established that this technique was employed in Mediterranean centres until the early 1st century AD. Grose classified the Mediterranean glass vessels utilizing the Core Forming technique into three distinct categories: the first group spans the late 6th to mid-4th century BC, the second group encompasses the mid-4th to late 3rd century BC, and the third and final group extends from the mid-2nd BC to the early 1st century AD (Grose 1989). The temporal range of the Northern Necropolis is posited to extend from the 3rd century BC to the 1st century AD, as inferred from the analysis of grave goods and the typological classification of burial structures; The densest concentration of graves is dated to the interval between the 2nd century BC and the 1st century AD (Özer and Doksanaltı 2017, 288). The fragment of the core-formed

These vessels are characteristic of terracotta *unguentaria* utilized for the storage of fragrances or medicinal substances, in addition to various types of bottles, jugs, bowls, and jars. The latter items are commonly classified as table vessels, which are well-documented in the archaeological record of terracotta artefacts. The glass collection of the Aizanoi necropolis also includes groups such as pendants and beads, which are prominently found in the necropoleis.

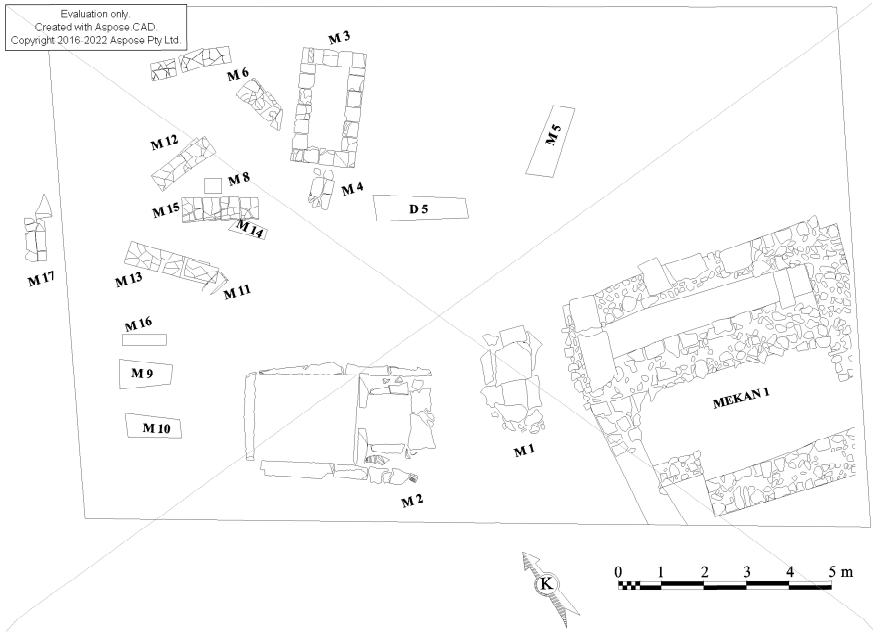

Figure 2: The plan of the Northern Necropolis *(2011-2020 Aizanoi Excavation Archive)*

D9-A

D9-A denotes the initial excavation area of the Northern Necropolis, which was commenced in 2012. Anthropological studies have indicated that this trench contains the highest density of human skeletal remains. Correspondingly, it is not unexpected that Trench D9-A also yielded the greatest quantity of glass artefacts[11]. In Space 1, a designated zone, a total of 17 burial structures were unearthed, all of which consisted of inhumation graves. Cremation burials are also present in D9-A.

It is worth mentioning that Grave 2 stands out as the sole chamber grave discovered thus far, revealing glass artefacts. An anthropological examination, conducted by Prof. H. Üstündağ, has identified a total of 25 inhumation burials within this grave. Based on the findings, it has been interpreted as a collective burial site for a family unit, comprising of 22 adults (10 males, 7 females, and 5 of undetermined sex), 1 adolescent, and 2 infants. The contents of the grave include three distinct glass vessel fragments, namely an *unguentarium* (fig. 3.4), a bottle (fig. 3.5), beaker (fig. 3.1), as well as three glass beads (figs. 3.6-8), two of which share the same colour and size[12].

vessel recovered from the North Necropolis is unfortunately too small to yield measurements that would facilitate its classification according to the schema proposed by Grose. However, the observation that the densest finds within the necropolis are categorized as the final group in Grose's classification may provide some insights regarding the vessel employing the core-forming technique; nonetheless, it does not permit a definitive conclusion.

[11] Üstündağ 2019, 318.

[12] This grave exhibits distinct characteristics that differentiate it from the prevalent grave types in the Northern Necropolis and represents the only known example to date. Alongside the glassware, a bronze ring earring, presumably belonging to one of the interred women, and a silver ring, likely a personal item, were discovered

The analysed *unguentarium* exemplifies a bulbous form, and this category of *unguentaria* exhibits variability in size. It is among the most prevalent forms of *unguentaria* from the Early Roman Imperial period, characterized by its cylindrical neck, either inwardly or outwardly rounded rim, pear-shaped body, and flat base. In these specimens, the body length constituted approximately one-fifth of the neck length; however, there was a gradual increase in the dimensions of the neck over time[13]. They are recognized in Egypt as the standard form of the 1st century AD[14]. The traces of continuous production and utilization in the Syria-Palestine region, along with the fragments of the form documented in Cyprus, serve as indicators of the widespread prevalence of this type of *unguentarium* during the 1st century AD[15]. It is acknowledged that these inexpensive, rapidly produced, and predominantly undecorated artefacts are frequently recorded as discoveries within necropoleis, particularly in relation to burial offerings[16]. C. Isings also reports that early examples of this form, categorized as grave and household finds, date from the 1st century AD and have been recovered from Locarno, Pompeii, Herculaneum, Siphnos, Dura Europos, and Priene[17]. This type of *unguentarium* is also prevalent among terracotta examples. Such *unguentaria* have been frequently discovered in various Mediterranean cities and are associated with burial practices and other contexts dating from the 1st century through the 2nd century AD[18].

Glass studies conducted on both the Northern and Southern Necropolis revealed that the *unguentarium* form was recorded both within and outside the grave. This suggests that *unguentaria* may have served distinct functions at various stages of funerary rituals. Furthermore, their usage likely varied in relation to different burial practices, such as cremation and inhumation[19]. Nevertheless, the role of *unguentaria* in the funeral process remains a subject of scholarly debate. They are predominantly represented on grave reliefs as grave offerings. However, there is a noticeable absence of depictions illustrating their specific role in funeral rituals or their function in the preparation of the deceased for burial[20]. The same contentious issues concerning their utilization are also applicable to terracotta *unguentaria*. There is no evidence to indicate that glass and terracotta *unguentaria* fulfilled distinct functions within funerary contexts. The frequent occurrence of both glass and terracotta *unguentaria* during the same era can be attributed to advancements in technology. However, a comparative study analysing the quantitative data would be beneficial, as it would aid in the identification of temporal transitions between these materials. However, a study of this magnitude has yet to be conducted at the necropoleis of Aizanoi.

The quantity of glass *unguentaria* is markedly lower than expected within the identified range of glass forms recovered from the necropolis. This phenomenon may be attributed to a terminological confusion that is prevalent in certain cities characterized by a significant abundance of *unguentarium* forms. It is not uncommon to encounter certain bottle

adjacent to the skeleton of the other woman. Within the expansive burial area, a total of 31 open vessels, including bowls and figures, as well as 9 handled cups, 16 oil lamps, 1 coin, 1 tintinnabulum, a terracotta tray, numerous iron nails (both small and large), and 8 fragments of brick were unearthed.

[13] Isings 1957, 42, form 48a-b.

[14] Hayes 1975, 138.

[15] Erten 2018, 153.

[16] Kucharczyk 2004, 96.

[17] Isings 1957, 42.

[18] Saraçoğlu 2011, 7.

[19] For instance, figure 14.1 presents an example of an *unguentarium* that was likely utilized during the cremation phase, left with the deceased, and subjected to physical deterioration. It is plausible that it functioned as part of a ritual rather than as a burial offering intended for the deceased at the conclusion of the cremation process.

[20] Anderson-Stojanović 1987, 116.

forms, particularly within grave contexts, that are documented as *unguentaria*. In this context, the definitions provided by glass experts D. Ignatiadou and A. Antonaras in their treatises on glass terminology are of particular significance. They define glass bottles as "large or medium-sized handleless vessels"[21]. In the same study, the *unguentarium* is examined under the subheadings of core forming and blowing concerning its production technique and is defined as follows: "Perfume vessels with a closed shape, small or medium-sized"[22]. It is essential to consider both content variations and form distinctions when establishing definitions. D. Whitehouse elucidates the origins of the terminological confusion, asserting that the term "*unguentarium*," which is thought to have originated from Roman toilet bottles, was, in fact, coined in the 19th century. This term derives from certain Latin words employed by the Romans in relation to perfume "unguentum", as well as the term "unguentarius," which referred to sellers of perfume[23]. As noted by Whitehouse, the term "*unguentarium*" is a relatively modern designation, and the ancient nomenclature for these vessels remains unidentified. In summary, although we can ascertain the rarity of glass *unguentaria* from the North Necropolis of Aizanoi in relation to other forms within this necropolis, we lack the necessary data to compare these findings with those from other necropoleis across Anatolia.

Figure 3.1 presents a beaker/bowl form characteristic of the Early Roman Imperial period, aligning with the dating of the *unguentarium*[24]. The handle fragments depicted in figures 3.2 and 3.3 were discovered in conjunction with this piece and display analogous colour characteristics. If this hypothesis is accurate, figure 3.1 can be categorized as belonging to the "Bowl/Beaker with Handles" type; however, the handles could not be definitively associated with the body in our proposed drawings.

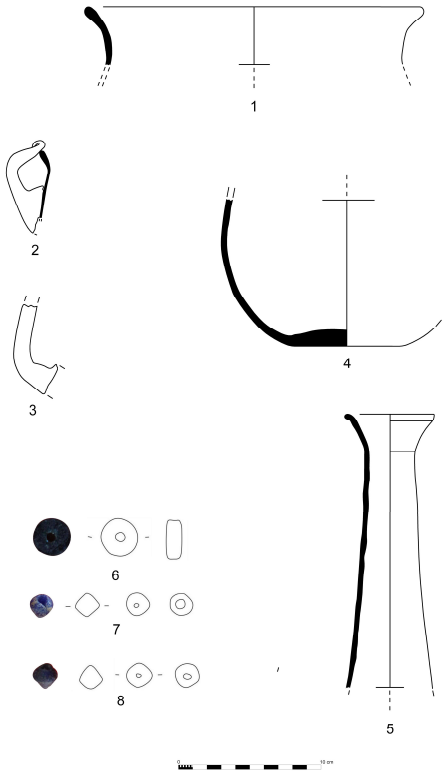

Figure 3: Glass finds from D9-A, Grave 2

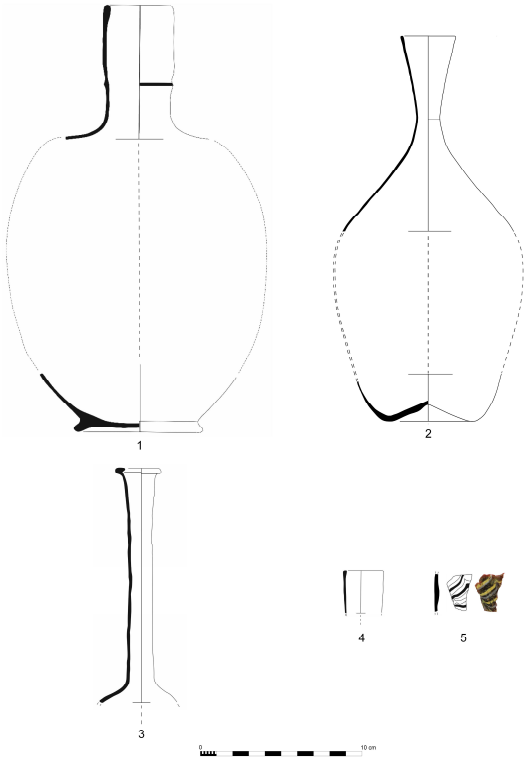

Figure 4: Glass finds from D9-A, Grave 3

[21] Ignatiadou and Antonaras 2008, 135.
[22] Ignatiadou and Antonaras 2008, 216.
[23] Whitehouse 2006, 87.
[24] Majcherek 2018, 44, no. 9.2; Çakmaklı and Höpken 2015, 34, no. 41; Atila and Gürler 2009, 132, no. 206.

Grave 3, commonly referred to as the "Rooster Grave" due to the presence of a terracotta rooster figurine within its confines, possesses significant artefacts that serve to establish the chronological framework of the necropolis and contribute to the classification of glass objects in the Aizanoi necropolis. This grave is attributed to two adults aged 35-40 years. One of the individuals has been identified as male; however, the sex of the other deceased remains uncertain. It is probable that this individual was the spouse of the grave owner[25]. The discovery of two bronze coins within the Aizanoi Rooster Grave indicates that one dates to the 2nd century AD, while the other belongs to the latter half of the 4th century AD. Upon investigation, it has been proposed that both individuals were laid to rest during the 2nd century AD, and the presence of the 4th century AD coin can be attributed to illicit activities such as grave robbery[26]. All glass artefacts (fig. 4), with the exception of a core-formed piece, are bottle forms that reflect the 2nd and 3rd-century AD tradition (figs. 4.1-4). The artefacts depicted in figures 4.2 and 4.3 were discovered within the grave situated near the head of a male individual[27]. While the *unguentarium* form depicted in figure 4.3 cannot be identified typologically due to the absence of a complete body and base[28], the artefacts illustrated in figure 4.2 serves as a representative example of a category of bottles classified as 'bottles with conical mouths,' which are primarily associated with the 3rd century AD[29]. Figure 4.1 represents a unique bottle/jug form characterized by its hypothesized body feature. Its design includes an inverted rim, flat cylindrical neck, and ring base, which collectively demonstrate the fundamental characteristics of a category of artefacts from the Middle Roman Imperial period[30]. In this regard, it bears historical similarities to figure 4.2. The horizontal line that encircles the neck was employed consistently throughout the empire and should not be considered a criterion for dating. The historical inconsistency of the glass artefacts recovered from Grave 3, which span a diverse range of periods including the Early and Middle Roman Imperial period, indicates that the Grave may have been reopened following its initial closure.

Grave 7, designated as the "Heraclian Grave" due to the discovery of a Heracles statuette within, is postulated to be a soldier's grave based on the presence of this statuette[31]. This grave serves as a precursor to cremation-type burials. The glass *unguentarium* (fig. 5) found within the grave exhibits a distinct form typically associated with the Early Roman Imperial period. This group is differentiated from similar examples by its cobalt blue colouration, which is occasionally adorned with glass threads, as seen in the Aizanoi instance. In some cases, the vessel remains entirely unembellished[32]. The decorative technique used, which includes cobalt blue and white spiral glass bands, is consistent with examples discovered in 1st century burial excavations[33]. The elaborate *unguentarium* depicted in figure five exemplifies two prominent characteristics of mid-1st-century AD glassmaking:

[25] Özer 2016, 10.
[26] Özer 2016, 10.
[27] Üstündağ 2019, 311-331.
[28] Although the body is absent, the artefact bears a resemblance to the spherical-bodied *unguentaria* from the 1st and 2nd centuries AD. It features a pressed rim that has been folded inwards, along with a long, slender cylindrical neck and a defined profile from the neck to the body, for examples, see: Vessberg 1952, 138-139; Erten 2018, 169, cat. 65.
[29] Weinberg and Stern 2009, 127, no. 235; Gürler and Taştemür 2019, 185, cat. no. 33; Lightfoot and Arslan 1992, 196, no. 131; Erten 2018, 35, no. 8; Gürler 2000, 93, cat. 109; Schintlmeister 2021, 309, fig. 2.6.
[30] Çakmaklı 2017, 292, lev. 2.10 (Labraunda).
[31] Özer and Doksanaltı 2017, 287-288.
[32] For an example of a grave find from Köylü Garajı in Tarsus, see: Yurtseven 2006, no. 116, res. 3.
[33] C. Isings reports that miniature bottles featuring white bands on a cobalt blue background were recovered from tombs dating to the reign of Nero in Pompeii (Isings 1957, 41); It was retrieved from a 1st century AD tomb located on Lenonmart Street, adjacent to the Athenian Agora (Weinberg and Stern 2009, 78, no. 120).

the white-on-blue decorative scheme commonly observed in cameo glass of that era, and the form that resonates with various *unguentarium* designs from the same period[34]. The proposed dates for the statuette and the *lykion* discovered in the Heraclian Grave are consistent with the chronological framework that corresponds to the first half of the 1st century BC, extending to the first half of the 1st century AD[35] for the glass *unguentarium*.

The body of these vessels is predominantly onion-shaped. Unfortunately, it is not possible to assign these vessels to a specific sex. Despite the association of the Aizanoi specimen with an adult male, a similar *unguentarium* found in Güre was recovered from a female grave[36]. The example from the Athenian Agora was discovered alongside an *unguentarium* and a bronze mirror, artefacts typically associated with female interments[37]. A substantial quantity of colour-band blown bottles, along with a significant number of associated sherds, was discovered in the South Necropolis of Samothrace; one of these bottles corresponds to the Aizanoi sample. Dated to the first half of the 1st century, it is significant that this artefact was recovered from a child's grave[38].

Figure 5: The glass unguentarium from D9-A, Grave 7

The placement of the Aizanoi *unguentarium* outside the Grave rather than inside suggests that it was not intended as a burial gift, but rather as a component of the funeral ritual. It is likely that the liquid contained within the vessel was ritually dispersed either onto the deceased or onto the surrounding soil after the grave had been sealed. Likewise, the terracotta bowls and oil lamps discovered alongside the *unguentarium* were also left outside the grave[39]. However, it is not feasible to ascertain the function of this form in burial rituals based solely on the findspot of the Aizanoi example. This limitation arises from the fact that the example from Güre (Uşak, Türkiye) was situated within a grave, whereas the example from the Agora of Athens originates from a disturbed burial.

Grave 10 is characterized as a cinerary urn featuring a cremation burial. Among the recovered artefacts were fragments from six distinct vessels (figs. 6.1-7) and two glass beads (figs. 6.8-9). Notably, all of the vessels are transparent blue in colour and exhibit a bottle form, distinguishing this grave from others concerning glass-related finds. Furthermore, while there are numerous comparable instances of the bottle forms found in Grave 10, one specimen (fig. 6.2) is distinguished from the majority by its rounded bottom. This bottom is posited to belong to the same vessel as the fragment illustrated in figure 6.1[40].

[34] Fleming 1996, 22.
[35] Özer 2022, 32.
[36] Çakmaklı and Taştemür 2017, 118, fig. 4.5.
[37] Weinberg and Stern 2009, 78, no. 120.
[38] Dusenbery 1967, 41, fig. 18.
[39] Özer and Doksanaltı 2017, 287-300.
[40] Similar examples are known among the finds from the Northern Necropolis. See also figure 8.2, 8.5, 11.4.

This artefact, a variation of the "pointed bottomed *unguentarium*" known from the 1st century AD[41], is exclusively found in the North Necropolis graves within our glass project encompassing all sectors of Aizanoi. Similar to the aforementioned type of *unguentarium*, the Aizanoi examples feature a rounded rim and elongated neck; however, they are characterized by a rounded bottom rather than a pointed one. Anatolian examples of the rounded-bottom bottle type have been documented in the academic literature[42]. The dates assigned to these examples align with the 3rd century, which is presently recognized as the period of the final utilization of the Northern Necropolis.

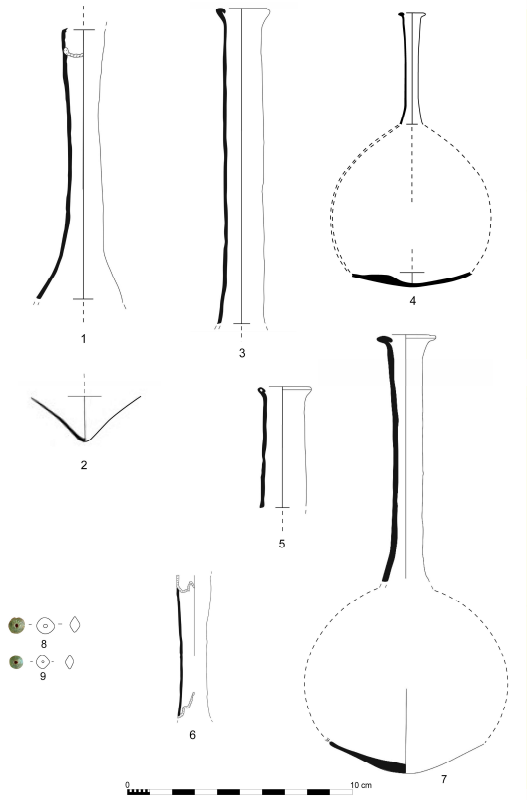

Figure 6: Glass finds from D9-A, Grave 10

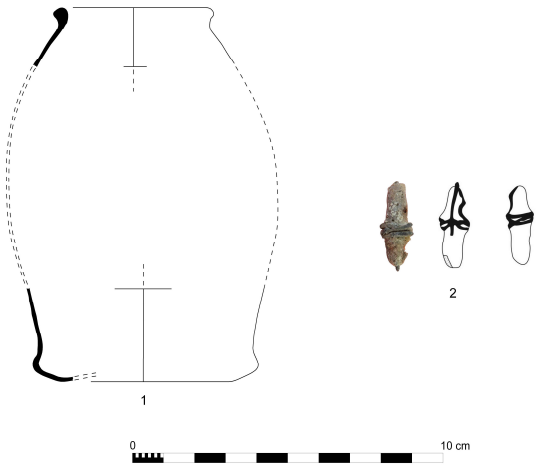

Figure 7: Glass finds from D9-A, Grave 17

In addition to the presence of analogous examples in the Northern Necropolis, the discovery of a mouth-neck fragment of the same type, albeit lacking a base, prompts an inquiry into whether these artefacts may have been locally or regionally produced for a necropolis-oriented purpose. Their positioning, which is not conducive to standing upright in terms of functional use, further supports the interpretation of these items as grave goods.

Grave 17 is a rudimentary earthen grave containing a cremation burial. Anthropological investigations indicate that this particular grave likely housed a solitary burial, that of a child[43]. Two glass objects, seven terracotta objects, including one oil lamp, four metal artefacts and a bronze earring were discovered within the grave. The presence of this earring fragment indicates that the grave belongs to a female[44]. As no assessment has yet been conducted on the contextual finds within the grave, our analysis of the glass objects will be based solely on their analogical characteristics.

[41] Gürler and Taştemür 2019, 110.
[42] Çakmaklı and Höpken 2015, 135, no. 304; Stern 2001, 241-242, no. 127; Gürler and Taştemür 2019, 280, no. 128;
[43] Üstündağ 2019, 319.
[44] Özer 2019, 382.

Noteworthy discoveries within the grave include a glass artefact adorned with a spiral metal thread, potentially functioning as a pendant or amulet (fig. 7.2) given its perforated nature, as well as a vessel resembling a jar (fig. 7.1) in both shape and colour. It is important to note that this specific glass group from Grave 17 is represented by a solitary example within the necropolis.

It has not been possible to comment on the form of the aforementioned artefact, which we classify as a pendant. Although the metal threads on the artefact likely encompass the entire surface, both the artefact and these metal threads were recovered in an incomplete state, rendering them unsuitable for comparative studies regarding their form. The identification of an amulet in Grave 17, which is that of a child, represents a plausible proposition. Interestingly, these pendants hold particular significance in the context of infant and child burials, often comprising the most prominent category of artefacts. Amulets are most commonly found in the grave s of children under six years of age, both in quantity and frequency[45] and they possess a rich and extensive historical significance[46]. In this regard, although certainty is not established, it can be posited that a fragment of a larger pendant was interred as a burial item for the deceased child, particularly in light of the presence of the hole.

The jar (fig. 7.1) represents an exceptional case due to its rare purple colour. Similar to the millefiori vessel (fig. 13) retrieved from the Northern Necropolis, this artefact is evidently of foreign origin. A total of 51 pieces were discovered. As a result of restoration efforts, the artefact was reconstructed to the extent that the form of the artefact could be revealed; however, not all of the components could be reassembled. No other examples have been identified within the necropolis, and it maintains a unique status in analytical evaluations. Although it is not definitively established, the morphological characteristics of the vessel suggest that it may have been utilized as an urn known from the Roman Imperial period. Although glass urns are not frequently encountered in Roman cremation burials of children, they are considered recognized artefacts[47]. However, when adult burial or urns containing remains undetermined sex are analysed, it becomes evident that there are significantly more instances documented in the modern literature[48]. Nevertheless, the numerical scarcity of glass urns in comparison to their terracotta counterparts remains significant, even following the advent of the blowing technique. If the 'urn' theory is applicable to this glass jar, it may be regarded as significant data concerning general distribution.

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[45] Bel 2012, 204.

[46] Glass pendants, first evidenced in the 7th century BC, were manufactured using the core forming method, a prevalent production technique of that era (Gençler-Güray 2017, 66). It is posited that these early instances of glass pendants, which exhibit core forming techniques, primarily originated from graves located on the western coast of the Mediterranean, as well as from settlements and sanctuaries in addition to graves on the eastern coast (Seefried 1982, 35-40).

[47] In the southern region of Gallia, cremations of children aged between 3 and 10 years, contained within glass urns, have been identified in Montblanc, Eyren, and Marans, dating from the 2nd century AD. These cremations are characterized by the inclusion of several coins and an abundance of grave goods. A similar practice is observed at Sainte-Fortunade, although this site corresponds to the end of the 3rd century AD (Suárez and Blázquez-Cerrato 2019, 94).

[48] The collection of the National Museum of Denmark comprises six glass urns. Among these, three urns recovered from various locations in Italy retain bone remains within their interiors. All three urns have been dated to the period between 100 and 200 AD. Anthropological analyses indicate that the remains belong to two male individuals - one aged approximately 16,5 years and the other over 50 years - as well as one female individual over the age of 40, who are identified as the interred individuals associated with these burials (Becker 1997, 51-62). In the western provinces of the Roman Empire, cylindrical bottles were commonly used as cremation urns (Weinberg and Stern 2009, 115). For a glass urn dated to the 1st century AD, refer to the J. Paul Getty Museum (Less-Causey 1983, 153, cat. 1).

Another aspect to consider is the utilization of purple in the jar. It is evident that the colour purple served as a status indicator during Roman times. This indicator is reflected not only in clothing[49] but also in various objects. It is improbable that the presence of this colour, which is relatively uncommon in glass artefacts, on prestigious vessels such as mosaic glass wares is merely coincidental. In the context of Aizanoi, regardless of whether it is definitively identified as an urn, it signifies the social status of the child interred in the grave. Indeed, a child's ownership of a cremation grave can be considered a significant indicator of social status in its own right. In her study, E. Özer examines the prevalence of infant mortality in antiquity, attributing it primarily to complications associated with childbirth and the postnatal period. She notes that funeral rituals were often not conducted, and cremation was not performed if the child had not yet begun to teethe. Based on this evidence, she concludes that the inhabitants of Aizanoi exhibited a heightened sensitivity to child mortality and were positioned outside of mainstream practices regarding death and mourning[50]. Seventeen infants and children are documented to have been interred in the North Necropolis of Aizanoi, with burial dates ranging from the 1st century BC to the 1st century AD. Three of these graves are associated with cremation burials.

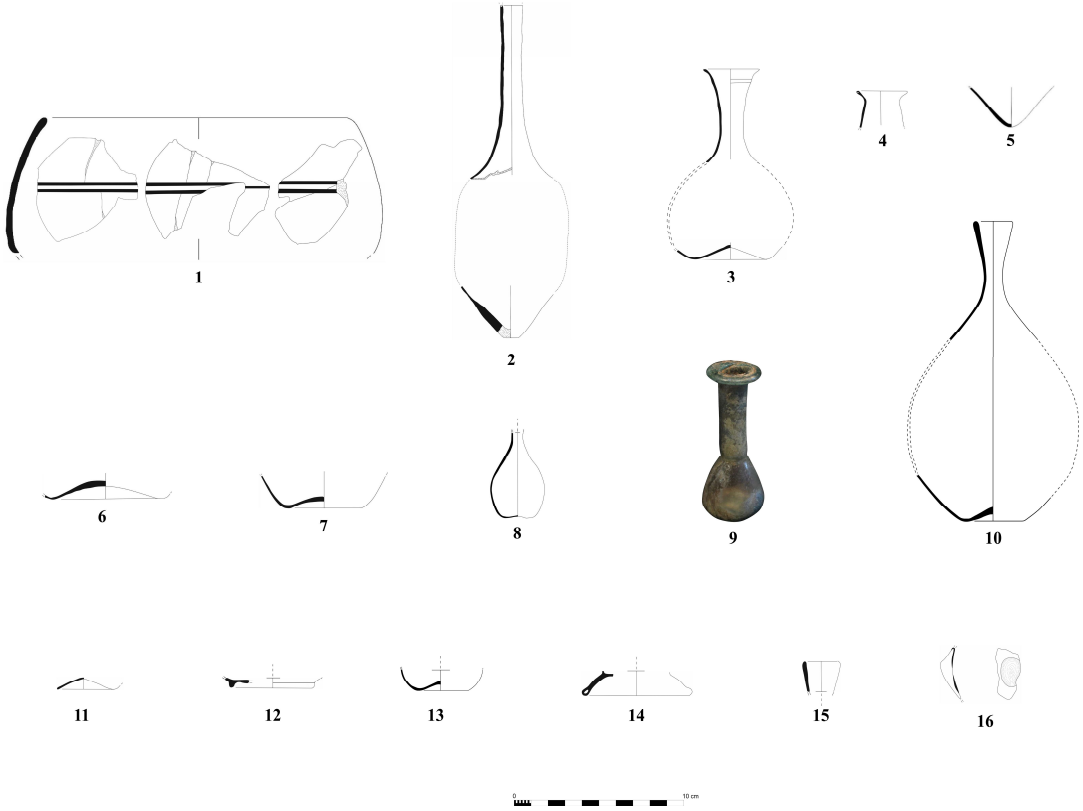

Figure 8: Glass finds from D9-A, "North I" and "North II"

S. Perna, who studies Roman cinerary urns made of coloured stone, notes that the importation of coloured marbles to Rome, commencing in the 1st century BC, led to the increased prevalence of funerary urns crafted from Egyptian alabaster, purple porphyry,

[49] It is well established that individuals who possessed the financial means to purchase purple fabric, a costly type of textile, generally favoured garments in this hue. However, during certain historical periods, emperors sought to impose restrictions on specific shades of purple, asserting these colours as their exclusive privilege (Croom 2010, 18).
[50] Özer 2019, 375-393.

and, on occasion, granite in Roman burial practices[51]. It is feasible that the type of precious pink marble utilized in cremation urns is an imitation, as evidenced by the reflection in the glass in this instance.

In Trench D9-A, excavation expansion efforts were undertaken in a northerly direction within a zone encompassing uncomplicated earth graves, designated as "North I" and "North II". The excavations in this area yielded fragments from nine distinct vessels, including one complete candlestick *unguentarium*[52] (figs. 8.1-9). The group encompasses a diverse array of vessels dating from the 1st to the 3rd and 4th centuries AD. The spherical bowl depicted in figure 8.1, characterized by its flat base and wheel-cut lines, represents a quintessential bowl form of the 1st century AD[53]. Figures 8.2 and 8.5 illustrate a bottle featuring a rounded bottom, a design also identified in Grave 10. Figure 8.3 depicts a globular bottle featuring a smoothly rounded rim and a ringed base. This type of bottle, referred to in the literature as a "bottle with profiled funnel mouth," occasionally features an applied coil along the mouth profiles, as exemplified by the Aizanoi specimen. It can be dated to the 2nd and 3rd century AD[54]. Figure 8.8 depicts a miniature *unguentarium* found with a broken rim. The remaining artefacts in this group consist of two concave bases (figs. 8.6-7) and one bottle rim (fig. 8.4), further indicating their association with the Early and Middle Roman Imperial period.

In the inhumation grave structure designated as Unit 3 in D9-A, a male, a female, and one child were interred[55]. Additionally, two distinct vessel fragments were recovered from this context. One of these artefacts consists of a fragment of a bottle's mouth (fig. 8.15) that exhibits the same form characteristics as the bottle depicted in figure 8.10[56]; the other is a fragment of a vessel that exhibits a mould-blowing technique, characterized by its transparent colouration and oval relief decoration (fig. 8.16). This type of vessel is represented by only one example in the Northern Necropolis, yet it is documented in association with the theatre building of the city[57]. Unit 3 contains artefacts that can be analysed by considering the context of the grave findings. In addition to the glassware, the assemblage includes a bronze earring fragment likely belonging to a woman, a single oil lamp fragment, seven fragments of bowls and figures, and two bronze beads that presumably belonged to either a woman or a child[58]. Both glass and terracotta vessel groups are not categorized within any specific sex or age group.

In D9-A, there is another group of glass artefacts that, although not classified as grave goods, are nonetheless associated with the necropolis. One of the problematic vessels regarding dating is the beaker form illustrated in figure 3.14. Characterized by its "high base ring" feature, this form is also referred to as the "footed beaker" in archaeological literature and has been discovered in a variety of contexts, spanning from the Early Roman Imperial

[51] Perna 2012, 787.
[52] For information on candlestick *unguentaria*, see fn. 67.
[53] Isings 1957, 28-29, type 12; Lightfoot 1989, 26, no. 9; Çakmaklı 2012, 165, no. 3.1; Hayes 1975, 56, no. 132; Çakmaklı and Höpken 2015, 28, no. 25.
[54] Foy 2010, 289-299, no. 522; Lightfoot 1989, 48, no. 70; Çakmaklı and Höpken 2015, 60, no. 102.
[55] Özer 2019, 378.
[56] These two specimens represent variations of the same form as the bottle with conical mouth discovered in Grave 3, which is depicted in figure 4.3.
[57] During the excavation conducted at the Aizanoi Theatre in 2013, ten specimens of this type were uncovered. However, there is a lack of definitive evidence regarding the vessels to which the fragments are associated. The fragments were discovered in association with glass items attributed to contexts from the 4th and 5th centuries. The colours of the samples vary, including turquoise blue, transparent, and light blue.
[58] Özer 2019, 378.

period to the 3rd and 4th centuries AD[59]. Another glass vessel in this collection is the "bottle with a funnel-shaped mouth." (fig. 8.10). This particular type of bottle experienced significant popularity between the 2nd and 4th centuries AD[60].

D9-D

During the archaeological excavations carried out in 2013 within area D9-D, a pear-shaped glass *unguentarium*, believed to be associated with Grave 4, was discovered as part of the expansion works in the western region (fig. 8). It is noteworthy that this specific *unguentarium* is the sole glass vessel that was unearthed in the D9-D area. If its connection to Grave 4 can be verified, anthropological reports suggest that this particular *unguentarium* may have played a role in the burial ritual of an adult female.

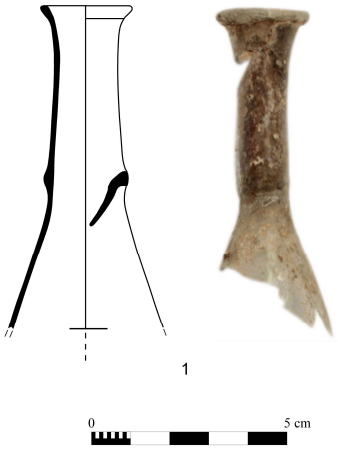

Figure 9: The glass unguentarium from D9-D, Grave 4

Among the various types of *unguentaria*, pear-shaped *unguentaria* may be considered the simplest forms to produce. This specific type of *unguentarium* seems to be extensively documented among the *unguentaria* discovered in Anatolian excavations[61]. In Egypt, they are acknowledged as standard forms from the 1st century AD[62]. *Unguentaria* of similar form discovered in the Athenian Agora have been dated to the early 2nd century AD[63]. Comparable instances from the Early Roman Imperial period have also been documented in domestic contexts in Nea Paphos, Cyprus[64]. It is evident that this prevalent form of *unguentarium* was widespread in both the eastern and western centres of the empire.

D9-F

Grave 4 is identified as an inhumation grave, containing the remains of one adult female. Two bottle forms were discovered in the grave (figs. 10.1-2), both of which are recognized vessel types from the Northern Necropolis[65]. In addition to the glass artefacts, two bronze coins were discovered in the grave: one situated in the individual's mouth and the other located within the skull. However, archaeological studies pertaining to the coins have yet to be completed.

There are six distinct bottles within the glass artefacts group obtained from Grave 5, situated in D9-F (fig. 11). Although the artefacts in Grave 5 have not yet been analysed collectively, the assemblage in addition to the glass vessels can be enumerated: terracotta bowl, *unguentaria*, oil lamp, figurine head, bird figurine, bull figurine, rooster figurine, grotesque figurine head, Attis heads, *pyxis*, and nails. All the figurines from Grave 5 were evaluated by T. Türküsever and dated to the Early Roman Imperial period, specifically to the

[59] Claros (Taştemür 2007a, no. 159); Parion (Kasapoğlu 2018, 228); Medusa Museum (Çakmaklı and Höpken 2015, 40, cat. 55); Corning Museum (Whitehouse 1997, 224).
[60] Isings 1957, form 14a; Schwarzer 2009, 106, no. 1; Atila and Gürler 2009, 160, cat. no. 240; Çakmaklı and Höpken 2015, 53, no. 84; Canav 1985, 55.
[61] For instance, studies on glass typology conducted in the Caria have demonstrated that this typology exhibits the highest concentration of *unguentarium* finds. It has been documented in numerous centres, including Stratonikeia, Idyma, Derebağ, Akdağ, Belentepe, Köyceğiz, Gümüşkesen, and Yatağan (Çakmaklı 2012, 91).
[62] Hayes 1975, 138.
[63] Weinberg and Stern 2009, 57.
[64] Mazanek 2014, 299.
[65] Both artefacts exhibit typological similarities to those presented in figures 6.4, 6.7, 8.10, 11.4, and 11.6.

middle of the 1st century AD. This dating was established based on the Caligula era coin discovered in the grave (37-41 AD), as well as comparisons with similar artefacts[66].

Glass artefacts are frequently encountered within a grave characterized by such a rich assemblage. The majority of glass bottles were retrieved from the area around the kneecap and below. The presence of such a concentrated collection of glass artefacts in the burial of a single adult sets it apart from other groups.

Figure 10: Photograph of artefacts *(2011-2020 Aizanoi Excavation Archive)* and illustrations of glass items retrieved from D9-F

The first notable feature of this artefacts group is an *unguentarium* of the candlestick shape (fig. 11.1). The form of this vessel likely dates back to the end of the 1st century AD[67]. Candlestick-shaped *unguentaria* with bell-shaped bodies were discovered containing olive oil in a grave in Israel, dated to the second half of the 1st century AD[68]. In addition, R. E. Jackson-Tal, who categorizes this form as a bottle rather than an *unguentarium*, observes that comparable examples have been recovered from grave contexts within the region associated with Ramat Rahel (central Israel) spanning from the mid-1st century AD to the first quarter of the 3rd century AD[69].

Another intact vessel found alongside this collection is the bottle, which has a spherical body form and is entirely adorned with spiral glass bands (fig. 11.2). A similar kneecap, exhibiting the same form but lacking decoration and featuring a cut rim, has been documented as a grave find from the Silifke Necropolis, dating to the 3rd-4th century AD[70].

There are four distinct forms of long cylindrical-necked bottles, each differing in terms of body shape and base design (figs. 11.3-6). Each glass bottle exhibits characteristics

[66] Türküsever 2016, 99-119.

[67] The examples presented herein are limited in scope and serve to illustrate the prevalence of this particular form. In fact, candlestick-shaped forms represent one of the most commonly encountered types in the sites where *unguentaria* have been discovered. Some centres and collections featuring examples of candlestick *unguentaria* dated to the 1st century: For Anatolian examples, see: Metropolis (Akkuş-Koçak 2021, 84, cat. no. 102-108) Kabasakız (Çakmaklı 2012, 51, cat. no. 11.2); Idyma (Gürbüzer 2006, 129, cat. no. 75-76); Kaunos (Özet 1998, 128, kat. no. 85); Yüceören (Şenyurt et al. 2006, 38), Elaiussa Sebaste (Gençler-Güray 2009, 56, kat. no. 116-122), Maltepe-Kilisetepe (Erten 2018, 83, cat. no. 30). For examples from outside Anatolia, see: Thesalloniki (Antonaras 2006, 76, no. 130-131) Strasbourg Museum (Durlong-Arveiller and Arveiller 1985, 198, drawing 101); Dura Europos (Clairmont 1963, Type F), Ribezzo di Brindisi Museum (Bertelli 1987, 207, fig. 11d), Cave of Horror (Barag 1962, 212, fig. 10).

[68] Gençler-Güray 2009, 55-56.

[69] Jackson-Tal 2016, 574.

[70] Erten 2018, 57, cat. no. 17.

that are consistent with the contextual related kneecap and can be dated to the Early Roman Imperial period. In any case, three of the examples (figs. 11.4-6) represent variations of the globular-bodied bottle forms identified in the Northern Necropolis of Aizanoi[71].

Figure 11: Glass finds from D9-F, Grave 5

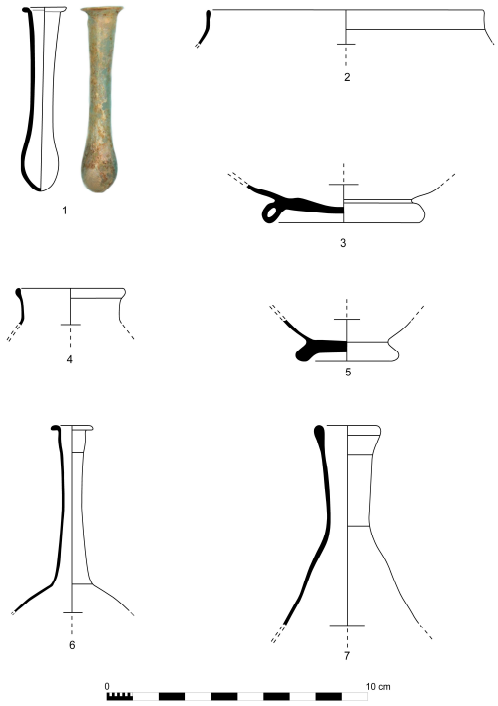

Figure 12: Glass finds from D9-G

D9-G

D9-G is a trench that yielded glass artefacts during both the eastern and southern expansions. Three glass artefacts, consisting of two fragments and one complete piece, were documented during the eastern expansion (figs. 12.1-3). It is established that *unguentaria*, particularly the tubular variants, were extensively utilized in the Early Roman Imperial period[72]. They can be observed across the empire, with instances from western centres dating back to the reigns of Claudius and Nero (1st century AD)[73]; however, there are also examples from the eastern regions that date to the 2nd and 3rd centuries[74]. These types of bottles serve as essential storage containers or fragrance vessels for cosmetics, pharmaceutical chemicals, and various other applications[75]. The rounded shape of the base of this type of vessel indicates that these vessels were specifically designed for the primary purpose of transporting the liquid contained within, suggesting an intention for single use[76]. Conversely, given that the design of such artefacts, which is unsuitable for standing, would result in the spillage of contents when positioned horizontally, it is more plausible that, in the absence of a stopper, the artefact contains a more viscous substance, such as ointment. In conjunction with the Northern Necropolis, the fragments illustrated in figure 12 can be classified as artefacts from the Early Roman Imperial period based on comparable examples.

[71] See fn. 65.
[72] Isings 1957, 41, from 27; Vessberg 1952, pl. IX, 25; Hayes 1975, 39, fig. 20, no. 630; Eliüşük 2023, 153, cat. no. 2-3; Matheson 1980, 29, no. 78-79; Çakmaklı 2012, 174, cat. no. 8.3; Gürler 2000, 32, no. 18-19.
[73] Israeli 1998, 28.
[74] Gürler 2000, 20.
[75] Yurtseven 2006, 95.
[76] Vessberg 1957, 140.

Figures 12.2 and 12.3 exhibit a bowl form. Similar characteristics of base rings with figure 12.3 are observed in certain jar and bowl forms dating to the Early Roman Imperial period and continue to be present in the Late Roman Imperial period. Figure 12.5 is a cast bowl base fragment. K. Dévai, who conducted an evaluation of the glass materials discovered at Intercisa (Dunaújváros, Hungary), articulates the following observations while dating the cast bowl base fragments: "Glass vessels imitating terra sigillata forms are typically characterized by angular profiles and were frequently composed of either strongly coloured or colourless glass." Dévai, also reports that cast bowls first emerged during the Flavian period and maintained their popularity until the mid-3rd century, although certain rarer forms became scarce by the 2nd century[77].

D9-H

When analysing the densities, it is observed that the group with the highest density remains D9-A, while the form group exhibiting the greatest density continues to be the jug and bottle, D9-H contains a significant find not only for Aizanoi glass but also for Anatolian glass as a whole (fig. 13). Although recognized from sites such as Parion[78], Claros[79], Magnesia[80], Labraunda[81], Limyra[82], Arykanda[83], Olba[84], Elaiussa Sebaste[85], and Iznik[86] in Anatolia, there remain relatively few centres where millefiori glass vessels have been identified. The millefiori technique, characterized by its distinctive construction and ornamentation, exemplifies a fusion of Hellenistic inspiration and the technical expertise of the Roman Imperial period. Although this type of vessel was recognized in Alexandria during the 1st century BC and in Rome in the 1st century AD[87], the Julio-Claudian period (14-68 AD) is posited as the apex of its popularity, with a decline occurring in the subsequent Flavian period[88]. Consequently, the dating of the Aizanoi millefiori from D9-H, associated with a cremation-type grave, aligns with the temporal framework established by our anthropological data pertaining to cremation burials[89].

Unfortunately, it was not possible to ascertain the sex and/or age of the individual interred in the grave; however, the meticulous craftsmanship and sophisticated design of the vessel indicate the high social status of the owner. Given that the overall living standards in the region of Aizanoi were relatively low, the disparity in social status of this grave owner becomes particularly evident.

Vessels employing mosaic and millefiori techniques represent rare discoveries in Anatolia. In particular, mosaic vessels, commonly referred to as 'millefiori' due to their distinctive decorative style, are even less frequently encountered. Considering the concentration of archaeological finds in the western provinces, the majority of mosaic vessels from Anatolia have been interpreted as direct imports. While this conclusion is largely valid,

[77] Dévai 2024, fig. 2.6, 2.7.
[78] Keskin 2019, 98, cat. no. 1.
[79] Taştemür 2007b, 171-172.
[80] Gençler-Güray 2013, 179.
[81] Hellström 1956, 5.
[82] Baybo 2016, I-Y.1-5.
[83] Tek 2007, 153; Tek 2013, 220.
[84] Erten and Akkuş-Koçak 2023, 97, lev. 2.
[85] Gençler-Güray 2009, 28.
[86] Çelik 2008, 3.
[87] Newman 1997, 198.
[88] Cottam and Price 2009, 188.
[89] For comprehensive information regarding the millefiori vessel form the Northern Necropolis see: Çakmaklı 2016, 141-151.

it is important to recognize that archaeological studies of glass in Anatolian centres, particularly research on glass production and glass vessel manufacturing sites, remain insufficient. Therefore, it would be imprudent to draw definitive conclusions regarding import-export dynamics until urban and regional studies are enhanced and corroborated by archaeometric analyses. Furthermore, Aizanoi millefiori exhibit characteristics that markedly differ from western examples and incorporate elements of more eastern origin.

Figure 13: The millefiori glass bowl from D9-H

D9-I

Four of the glass fragments (figs. 14.2-4) from the area designated as D9-I are associated with Grave 3, while one fragment is located outside the grave (fig. 14.1). This is an inhumation grave in which a child, approximately 4 to 5 years of age, was interred alone. The bronze coin located near the lower jaw of the child dates back to the Late Hellenistic to Early Roman Imperial period. In addition to the glassware, a miniature oil lamp was discovered at his feet, and three nails were located in proximity to his head[90]. The presence of the glass jug (figs. 14.3-14.4) [91] identified in this context further corroborates the proposed dating.

However, the bottle found within the same group is a product of a later period. The two fragments presented in figure 14.2 constitute components of a singular globular-bodied bottle[92]. This type of vessel, characterized by a downwardly tapering conical neck and a spherical body, is well-defined by archaeological data and is predominantly associated with contexts from the 3rd century AD. However, it can be asserted that these vessels continued to be observed until the 5th century[93]. Typically, their bottoms are concave, as evidenced by the Aizanoi example.

D9-I consists of a fragment of an *unguentarium* (fig. 14.1) found in an amorphous condition. This discovery is significant as it indicates that glass objects were utilized during the cremation rituals. Archaeometric studies demonstrate that by the Roman Imperial period, the technology associated with ritual burning had advanced to a level where glass objects could be melted and deformed at temperatures of at least 685°C[94]. The integrated analysis of archaeometric and anthropological studies indicates that cremation practices were likely conducted at Aizanoi, specifically at temperatures exceeding 700 degrees Celsius[95]. Although achieving the necessary temperatures to melt glass during the cremation process poses significant challenges, the presence of additional elements, particularly lead, in

[90] Özer 2019, 379.
[91] Nenna 2021, 135, no. 4; Majcherek 2018, 44, fig. 9.6; Çakmaklı 2013, 67, res. 2.1.
[92] Abu Uqsa 2007, 74; Crowfoot 1957, 408-420, no. 10.
[93] Erten 2018, 41; Antonoras 2006, 77, fig. 5-62, 63; Platz-Horster 1976, 85, no. 169.
[94] Glass artefacts fully melt at temperatures of 1200 degrees Celsius; however, temperatures between 650 and 700 degrees Celsius are deemed sufficient to induce deformation in the artefacts. For more information: Gherardi 2022, 362-376.
[95] Özer et al. 2022, 86.

the glass artefact may result in deformation due to melting during cremation[96]. Comparable deformations of glass objects employed in cremations have also been documented in other centres of the Roman provinces[97]. In her study, H. Cool reports that tubular *unguentaria* were frequently discovered in molten form within 1st-century burials. The contents of these vessels were utilized for body preparation prior to cremation or served as additional objects alongside other grave goods during the cremation process[98].

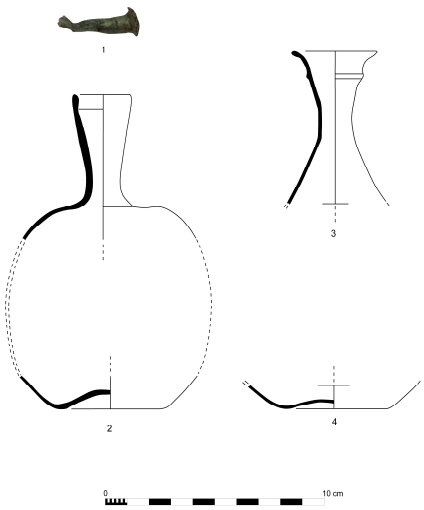

Figure 14: Glass finds from D9-I, Grave 3

The glass beads discovered on the cremated bones likely represent remnants of ornaments that the deceased was adorned with prior to the cremation process[99]. The function of the glass containers, which appear to have been utilized during the cremation process, likely involved the containment of fragrant oils intended for application onto the corpses during the ritual.

Concluding Remarks

Undoubtedly, one of the most significant studies contributing to the interpretation of a city's cultural history is that conducted through the examination of the necropoleis. One primary reason for this phenomenon is that burial customs typically show a remarkable stability over time, often being maintained for centuries. Conversely, in urban areas such as Aizanoi, characterized by heterogeneous communities and a significant presence of immigrants from diverse ethnic backgrounds, the complexity and richness of burial customs can be observed, reflecting the diversity exhibited in various cultural practices. The glass artefacts examined in this study, categorized typologically within the framework of the Northern Necropolis of Aizanoi, have also been assessed in relation to their social and economic contexts. Given the scarcity of studies on ancient glass in Anatolia and the general limitations of glass research in accessing finds supported by anthropological data, the availability of such evidence in the case of Aizanoi glass is particularly significant.

It has already been established that the Southern Necropolis of Aizanoi served as the burial site for individuals of significantly greater affluence compared to those interred in the Northern Necropolis[100]. Although the assemblage includes a significant imported item, the millefiori glass bowl, the glass collection from the Northern Necropolis is consistent with the broader assemblage and comprises glass vessel forms and artefacts from the Early Roman Imperial period that were relatively straightforward to produce and obtain.

Upon analysis of the general distribution of forms, it is evident that the category comprising jugs and bottles, which are integral components of daily tableware, constitutes the most densely represented assemblage of finds. This category predominantly consists of plain items; however, certain artefacts exhibit decorative elements, such as glass threads or incised decoration. The most prevalent decorative technique identified within this category

[96] Gonçalves et al. 2010, 137.
[97] The Encosta de Sant'Ana, Lisbon (Gonçalves et al. 2010, 137).
[98] Cool 2016, fig. 16.
[99] McKinley 2015, 132–134.
[100] Özer 2022, 178.

is the application of spiral glass threads. The most predominant production technique is free blowing. However, alternative methods such as the core-forming technique, mould blowing technique, mosaic technique, and casting have also been identified.

In addition to tableware groups, there exist glass *unguentaria* and beads. These artefact categories are commonly encountered across all necropoleis. Conversely, there are also individual finds that are suggested to be urns. If our hypothesis holds true, the discovery of one of the exceedingly rare glass urns within the Aizanoi Northern Necropolis serves as evidence that affluent families may have also selected this necropolis for their burials. Furthermore, this urn distinguishes itself due to its uncommon purple colouration. It is not surprising that this discovery was made in a cremation grave. As previously noted, cremation graves have been identified as the preferred choice of wealthier families in this area. Anthropological studies have established that the grave containing the artefacts belonged to a child. While the existing data indicates the presence of glass urns used for children, it is understood that these urns are more commonly found in adult burials.

Our typological study, when analysed within the social and economic context of Aizanoi, has facilitated the formulation of several conclusions regarding the population of the region:

1. The welfare level of the urban population of Aizanoi appears to be relatively low, as evidenced by the predominant preference for inhumation among this group.

2. Imported and decorated artefacts are predominantly associated with cremation graves, suggesting that these interments likely belonged to a class with a higher socioeconomic status.

3. The presence of convex-bottomed bottles and their density indicates the possibility of local or regional production. This specific vessel form is exclusively found within the Necropolis, implying that its production was likely oriented toward this particular context[101]. By the Roman Imperial period, it is reasonable to assert that the majority of local workshops in Anatolia were sufficiently satisfying the needs of their respective settlements, with the exception of luxury vessels and glass containers for specific substances, which were imported. Furthermore, the workshops identified to date in Anatolia primarily originate from the Middle and Late Roman Imperial periods. This prevalence may be attributed to the emergence of more established workshops with larger production capacities during these eras, facilitating the identification of kilns in excavations. Nonetheless, it remains plausible that some form of production organization existed to address small local demands prior to the aforementioned period. Large and permanent kilns were not necessary for these organizations; rather, production could also occur in locations where suitable heat was available, such as the praefurnium of baths. In conclusion, particularly in light of the typological analysis conducted, it is plausible that the glass artefacts recovered from Aizanoi may include forms that can be classified as both local or regional productions and imported variants. It is crucial to substantiate these studies with archaeometric results.

4. A fragment of an amorphous *unguentarium* suggests that certain artefacts may have played a role in the ritual practices associated with the cremation process.

[101] It is posited that these vessels, characterized by their ease of production, lack of intricate craftsmanship, absence of decoration, uniform colouration, nearly identical dimensions, and considerable abundance in both the southern and northern necropoleis of the same city, may represent the outcome of local or regional production. However, there is currently no primary evidence to substantiate glass production within the city, such as kilns, production residues, or defective items indicative of the manufacturing process. Furthermore, a comprehensive typological study of glass artefacts in the region has yet to be conducted. Consequently, this hypothesis remains unproven.

Several issues and inquiries arose during our study. For instance, questions regarding the potential differences between sexes in the utilization of forms as grave goods, as well as the significance of the placement of objects within graves in relation to ritual practices, remain largely unanswered. For instance, bottle-shaped artefacts were located near the head of the adult male deceased in Grave 3 D9-A, while they were situated around the kneecap in Grave 4 D9-F. What significance, if any, do these placements convey?

The distinction between grave goods and ritual items represents a critical issue that merits significant attention. However, this distinction can only be clarified through the advancement of glass studies, underpinned by anthropological research.

Another issue arises from terminological confusion in the definition of forms. For instance, the documentation of *unguentarium* forms - commonly encountered glass forms utilized in funerary rituals - intermingles with bottle forms that are also extensively employed, thereby complicating comparative analyses aimed at determining the intensity of use in necropoleis.

One of the most significant methods for maximizing the benefits of working with archaeological materials recorded as necropolis finds is to examine all items within their contextual framework through collaborative interpretation by experts. Consequently, it is essential that each of the grave finds is assessed by specialists, while also being interpreted collectively. The study of archaeological glass particularly requires this holistic method of investigation due to the challenges associated with dating criteria and the reliance of most typological studies on analogical comparisons. Although the North Necropolis of Aizanoi contributes more comprehensively to the study of glass than many other necropoleis, numerous artefacts from the graves remain to be assessed.

Acknowledgements

The Aizanoi Glass Project was initiated in 2015 and has successfully documented the entire collection of glass artefacts found in the city. This documentation covers the period from the beginning of the Aizanoi excavations to 2017. This study was conducted with the contributions of students from Karabük University and members of the Aizanoi excavation team. Additionally, archaeologists Elif Terzi Öz, Buket Gündüz, and Bayram Ali Seçgin have made substantial contributions to the digital components of this study. Prof. Dr. Ahmet Tolga Tek and Assoc. Prof. Dr. Çiğdem Gençler-Güray made significant contributions to the development and finalization of the study. I am profoundly grateful for their contribution. However, I would like to express my utmost appreciation to Prof. Dr. Elif Özer, whose invaluable guidance and trust in me have been instrumental in the handling of these significant artefacts.

Catalogue

Abbreviations: H.: Height; RDm.: Rim Diameter; mxDm.: Maximum Diameter; BDm.: Base Diameter

	Figure	No.	Grave	Fragment	Dimensions (cm.)	Colour	Description
1	1	1	D9-A G.2	Bowl	RDm.: 8 H.: 1,4	Colourless. Silver weathering and iridescence.	Bowl fragment of rounded and thickened rim.
2	1	2	D9-A G.2	Bowl?	H.: 3,2 mxDm.: 0,4	Colourless. Silver weathering and iridescence.	Attached handle fragment.
3	1	3	D9-A G.2	Bowl?	H.: 3 mxDm.: 0,4	Colourless. Silver weathering and iridescence.	Handle fragment. The initial segments of the profile and the connections to the body are absent.
4	1	2	D9-A G.2	*Unguentarium*	RDm.: 2,5 H.: 3,3	Light greenish. Silver weathering, iridescence and sand deposits.	Complete base. Pear-shaped body; flat base. No pontil scar.
5	1	3	D9-A G.2	Bottle	RDm.: 2 H.: 6,6	Light blue. Silver weathering, iridescence.	Rim fragment, part of neck.
6	1	4	D9-A G.2	Bead	mxDm.: 0,8	Black; opaque, glossy.	Complete. No decoration.
7	1	5	D9-A G.2	Bead	mxDm.: 0,5	Cobalt blue, dull colour.	Complete. No decoration.
8	1	6	D9-A G.2	Bead	mxDm.: 0,5	Cobalt blue, dull colour.	Complete. No decoration.
9	2	1	D9-A G.3	Bottle	RDm.: 2,7 H.: 5,5	Pale green, thin iridescence film.	Rounded rim, cylindrical neck, coil beneath and tubular base ring. Pontil scar.
10	2	2	D9-A G.3	Bottle	Rdm.: 3 BDm.: 6	Pale green, silver weathering and iridescence.	Rounded rim, cylindrical neck, shoulder, pushed in base.
11	2	3	D9-A G.3	Bottle	RDm.: 1,7	Colourless, silver weathering and iridescence.	Rounded rim, cylindrical neck and shoulder fragments.
12	2	4	D9-A G.3	Bottle	RDm.: 2,3 H.: 2,5	The determination of colour was not feasible due to surface deterioration. Black and silver crust, iridescent film on int.	Rounded rim fragment.
13	2	5	D9-A G.3	*Unguentarium*?	mXDm.: 6,2	Yellow, light brown and dark green. No iridescence.	Core forming technique.
14	3		D9-A G.7	*Unguentarium*	RDm.: 6,2 H.: 10,1 BDm.: 3,4	Cobalt blue with white coils.	Almost complete. The rim is fractured and lacks

							completeness. Flat base.
15	4	1	D9-A G.10	Bottle	RDm: 1,8 H.: 8,8	Light blue, bubbles, iridescence.	Rim fragment, long and cylindrical neck, shoulder.
16	4	2	D9-A G.10	Bottle	RDm.: 0,7 H.: 3,5	Light blue, bubbles, iridescence.	Complete pointed bottom (likely a fragment of the same vessel illustrated in no. 13.)
17	4	3	D9-A G.10	Bottle	RDm.: 1,5 H.: 10,2	Light blue, bubbles, iridescence.	Rounded rim, long and cylindrical neck.
18	4	4	D9-A G.10	Bottle	RDm.: 1,1 BDm.: 5,3	Colourless, bubbles, iridescence.	Infolded rim, cylindrical neck, flat base.
19	4	5	D9-A G.10	Bottle	RDm.:1,5 H.: 4	Light blue, bubbles, iridescence.	Rounded rim, cylindrical neck.
20	4	6	D9-A G.10	Bottle	RDm.: 1,6 H.: 6,8	Light blue, bubbles, iridescence, very fragmented.	Cylindrical neck fragment.
21	4	7	D9-A G.10	Bottle	RDm: 1,5 BDm.: 5,3	Light blue, silver weathering and iridescence.	Rounded rim, cylindrical neck, shoulder and slightly concave base.
22	4	8	D9-A G.10	Bead	mxDm.: 0,5	Pale green.	Complete intact. No decoration.
23	4	9	D9-A G.10	Bead	mxDm.: 0,6	Pale green.	Complete intact. No decoration.
24	5	1	D9-A G.17	Jug	RDm.: 12 BDm.: 6 H.: 15,3	Dark purple. Silver weathering and iridescence.	Rounded rim.
25	5	2	D9-A G.17	Amulet	H.: 2,8	The determination of colour was not feasible due to surface deterioration.	The object is encased in metallic threads. The threads were severed near the extremity of the object, and the continuation of the strings remains untraceable.
26	6	1	D9-A North II	Bowl?	RDm.: 9 H.: 4,2	Colourless, bubbles, iridescence, very fragmented.	Ground rim, horizontal Wheel cut lines.
27	6	2	D9-A North I	Bottle	RDm.: 1,3 BDm.: 1 H.: 3,1	Light blue, bubbles, iridescence.	Rim fragment, long and cylindrical neck, shoulder and pointed bottom.
28	6	3	D9-A North II	Jug	RDm.: 3,4 BDm.: 4,6 H.: 5,5	Colourless, bubbles, iridescence.	Rounded rim, cylindrical neck, slightly concave

							bottom.
29	6	4	D9-A North II	Bottle / Jug	RDm.: 3 H.: 2,1	Silver weathering and iridescence.	Rounded rim.
30	6	5	D9-A North II	Bottle	RDm.: 1 H.: 2,1	Light blue, bubbles, iridescence.	Pointed bottom.
31	6	6	D9-A North I - B13	Jug	RDm.: 7,5 H.: 1,1	Colourless, bubbles, iridescence.	Concave base.
32	6	7	D9-A North II	Bootle / Jug	RDm.: 4,2 H.: 3	Colourless, bubbles, iridescence.	Slightly concave base.
33	6	8	D9-A North II	*Unguentarium*	mxDm.: 3,5 BDm.: 1,56	Colourless, iridescence and sand deposits.	Pear-shaped body.
34	6	9	D9-A North II	*Unguentarium*	RDm.: 3,8 BDm.: 2,3 H.: 8,3	Light blue, iridescence.	Rounded rim, pear-shaped body, flat base.
35	6	10	D9-A	Bottle	RDm.: 3 BDm.: 6 H.: 2,1	Colourless, iridescence and sand deposits.	Fire rounded rim, concave base.
36	6	11	D9-A	Bottle?	RDm.: 3,5 H.: 6	Colourless, severe pitting and iridescence.	Concave base.
37	6	12	D9-A	Beaker / Bowl	RDm.: 5 H.: 0,7	Pale green, bubbles, iridescence, severe pitting.	Tubular base ring.
38	6	13	D9-A	Bottle	RDm.: 5,1 H.: 0,4	Blue green, bubbles and iridescence.	Slightly concave base.
39	6	14	D9-A	Beaker / Bowl	RDm.: 3 H.: 2,8	Pale green, bubbles, iridescence.	Out folded foot.
40	6	15	D9-A Unit III	*Unguentarium*	RDm.: 2 H.: 1,8	Colourless, bubbles, iridescence.	Rounded rim, slightly concave neck.
41	6	16	D9-A Unit III	Bottle?	H.: 3	Colourless, severe pitting and iridescence.	Mould-made oval relief on a fragment of the body.
42	7	1	D9-D G.4	*Unguentarium*	RDm.: 2,2 H.: 9	Colourless, bubbles, iridescence.	Rounded rim, neck and a part of pear-shaped body.
43	8	1	D9-F G.4	Bottle	RDm.: 2 BDm.: 0,8	Light blue, bubbles, iridescence.	Rounded rim, shorth neck, shoulder and pointed bottom.
44	8	2	D9-F G.4	Bottle	RDm.: 3 BDm.: 14	Colourless, bubbles, iridescence.	Infolded rim, long cylindrical neck and flat base.
45	9	1	D9-F G.5	*Unguentarium*	RDm.: 5 BDm.: 2,9 H.: 16,8	Blue green, iridescence.	Candle-stick *unguentarium*. Rounded rim, flat base.
46	9	2	D9-F G.5	Bottle	RDm.: 2,7 BDm.: 3,6 H.: 11,8	Blue green, iridescence.	Funnel Mouth, neck and body with spiral coil,

							slightly concave base.
47	9	3	D9-F G.5	Bottle	RDm.: 1,7 BDm.: 3,2 H.: 9,1	Colourless, iridescence, pitting.	Rounded rim, long cylindrical neck, slightly concave base.
48	9	4	D9-F G.5	Bottle	RDm.: 2,4 mxDm.: 8,9 H.. 1,1	Colourless, bubbles, iridescence.	Rounded rim, long cylindrical neck, slightly pointed base.
49	9	5	D9-F G.5	Bottle	RDm.: 3 BDm.: 7,5 H.: 5	Light blue, bubbles, iridescence.	Rounded rim, cylindrical neck, slightly concave base.
50	9	6	D9-F G.5	Bottle	RDm.: 3 BDm.: 14	Colourless, iridescence, pitting.	Rounded rim, long cylindrical neck, flat base.
51	10	1	D9-G EE	*Unguentarium*	RDm.: 1,8 H.: 6,5	Light blue, iridescence.	Rounded rim, tubular body, round base.
52	10	2	D9-G EE	Bowl	RDm.: 10 H.: 1,3	Light blue, iridescence.	Rolled in rim.
53	10	3	D9-G EE	Bowl	RDm.: 3 H.: 1	Light blue, bubbles, iridescence	Tubular base ring.
54	10	4	D9-G SE	Jar	RDm.: 5,6 H.: 4,4	Colourless, bubbles, iridescence.	Rounded rim.
55	10	5	D9-G SE	Bowl	RDm.: 3,8 H.: 1,5	Blue green, bubbles, iridescence.	Tubular base ring.
56	10	6	D9-G SE	Bottle	RDm.: 2,5 H.: 12,7	Light blue, severe pitting and iridescence.	Fire rounded rim, long cylindrical neck.
57	10	7	D9-G SE	Bottle	RDm.: 2,5 H.: 9,2	Light blue, iridescence and severe pitting.	Infolded rim, neck and conical body part.
58	11	1	D9-H	Bowl	RDm.: 12,2 BDm.: 4,9 H.: 5	Opaque yellow, red, blue and green decorations on a dark brown opaque ground.	Millefiori bowl.
59	12	1	D9-I	*Unguentarium*	RDm.: 1,4 H.: 4,4	Dark green. Burns, fractures and amorphous.	Rounded rim.
60	12	2	D9-I	Bottle	RDm.: 3 BDm.: 4,9	Colourless, bubbles, iridescence, very fragmented.	Fire rounded rim, slightly concave base.
61	12	3	D9-I	Bottle	RDm.: 3,8 H.: 9,3	Colourless, bubbles, iridescence.	Rounded rim, coil beneath.
62	12	4	D9-I	Bottle	RDm.: 6,8 H.: 1,8	Colourless, bubbles, iridescence.	Slightly concave base.

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