Glass *exagia* from Stobi
Steklene uteži (exagia) iz Stobija

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Abstract
The paper presents the glass weights discovered during the excavation between 2009 and 2012, contextually belonging to the last stage of organized and urban life in Stobi. There are three circular glass weights used for measuring golden coins. The glass weights were discovered in similar contexts chronologically: one was discovered in one of the dwellings constructed between the radial and circular walls of the summa cavea of the Theater after it went out of use, the second one in a storage unit that was part of the shops and workshops behind the Semicircular Court, and the third in the Residential and Commercial quarter.
Key words: Stobi, Roman theater, glass weights, glass *exagium*, solidi

Izvleček
Članek predstavlja steklene uteži, ki so bile odkrite med raziskavami mesta Stobi, v obdobju med 2009 in 2012, in sodijo v kontekst zadnjega obdobja organiziranega mestnega življenja. Gre za tri okrogle steklene uteži, ki so jih uporabljali za merjenje teže zlatih novcev. Odkrite so bile v sorodnih kronoloških kontekstih. Ena je bila odkrita v poslopju zgrajenem med zidovi *summa cavea* gledališča Stobi, ko je bilo le-to že opuščeno, druga v skladišču, ki je bilo del trgovin in delavnic za polkrožnim dvoriščem, tretja pa v naselbinski in trgovski četrti.
Ključne besede: Stobi, rimsko gledališče, steklene uteži, glass *exagium*, solidi

Introduction

The Roman city of Stobi is one of the best-preserved archaeological sites in the Republic of North Macedonia. It is built on the confluence of two rivers: Erigon (Crna) and Axios (Vardar; Livy XXXIX.53.16, Heuzey 1873). Its strategic position on the main road connecting the Danube and the Aegean had a crucial role in its development as a commercial and administrative centre, covering the period between the 2nd century BC and the early 7th century AD.

The city was known as oppidum civium Romanorum during the time of Augustus. Later it became a municipium with an established provincial mint under Vespasian. Large public buildings were built in the early 2nd century (theatre, building with arches - library?, the temple of Isis, synagogue). During Late Antiquity, it became an episcopal seat and the capital of the province Macedonia Secunda, at least between 482 and 535 AD. The city's urban layout was transformed with the construction of large private residences, public baths and early Christian churches on the middle and upper terraces, organised within the street network. Surviving

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Figure 1: Stobi ground plan (after Blaževska 2021).

the earthquakes and barbaric raids during the 6th century, the city was finally abandoned at the end of the 6th or beginning of the 7th century AD (Papazoglou 1988, 313–323; Wiseman 1984, 289–314; Wiseman 1986, 37-50; Wiseman 2007, 85–110; Blaževska 2021, 189). The Late Antique city is well preserved as a direct consequence of the fact that there was no urban occupation after it was abandoned (Wiseman 1984, 294). The excavation data shows that during the 6th century, Stobi was still a vibrant city with an active commercial life, visible through the excavated shops and workshops along the collonaded Via Sacra, leading from the main city gate to the Semicircular court and the Episcopal basilica, the presumed centre of the city during this period (Nikolovski 2018, 325).

During the excavations between 2009 and 2011, a large portion of the southwestern part of the city was excavated, positioned between the fortification walls and the Semicircular court, named the Residential and Commercial quarter. This quarter consists of modest residential and commercial buildings, representing the last stage of urban life in Stobi from the late 6th and early 7th century AD (Blaževska 2021). During the same excavations, modest houses dating from the same period were also discovered on top of the *summa cavea* of the Theater and around the Temple of Isis.

During the aforementioned excavations an enormous quantity of material was discovered, including various weights and weighing equipment. Most of them are still unpublished, with the exception of a few that were uncovered in the excavations at the Semicircular Court in 2012 (Nikolovski 2018, 315–319).

The three glass weights that are the focus of this paper were discovered in the context of the last period of urban life in Stobi, in the Residential and Commercial quarter, as well as in the dwellings built on top of the Theater.

The finds

The first sample (CT-09-69) was discovered in one of the dwellings constructed between the radial and circular walls of the *summa cavea* of the Theater after it was abandoned and became a quarry for building material. The context in which the exagium was discovered is dated to the second half of the 6th century AD. The glass weight was made of light greenish glass, and has a circular shape (Fig. 2). It has a diameter of 2.1 cm, is 0.5 cm thick and weighs 3.93 g. It is flat and rough on the backside, and has a rolled rim and a stamped box monogram in the central part (Fig. 3), containing the letters A, E, Υ and O. The context of discovery did not contain other finds related to weighing.

Figure 2: Glass exagium with box monogram (CT-09-69; NIS archive).

Figure 3: Monogram on the exagium (CT-09-69; NIS archive).

The second sample (CT-12-36) was discovered in a closed deposit, on a floor level in Storage room 9 behind the Semicircular court, closely connected to commercial activities. It was made of pale, yellowish glass, and also has a circular shape with a rolled rim and a stamped box monogram in the central part (Fig. 4), containing the letters A, M, O, Υ and T. Like the first sample, its backside is flat and rough. Its monogram is difficult to discern, and I have not identified an analogy. The glass weight has a diameter of 2.15 cm, its thickness varying between 0.64 and 0.84 cm, and weighs 4.35 g. There are numerous other finds in this deposit, but I

Figure 4: Glass exagium with box monogram (CT-12-36; NIS archive).

Figure 5: Glass exagium with a bust of an eparch and an inscription (CT-09-68; NIS archive).

will only mention the ones relevant to weighing: a bronze balance with two bronze scale pans, four bronze coin weights, a lead weight with a pyramidal shape with a ring on top and a square bronze lock (Nikolovski 2018, 319). The context in which this glass weight was discovered completely follows what a money changer's kit would contain. They were usually kept in a closed wooden box. Well preserved boxes with weighing equipment have been found mostly in shipwrecks (Pitarakis 2012, 407–410). The latest coin discovered in the same deposit is a follis struck in Thessalonica between 583-584 AD, during the first years of the reign of Maurice (Nikolovski 2018, 319).

The third glass weight in question (CT-09-68) was discovered in the residential and commercial quarter, in the yard of an enclosure around one of the towers on the northwestern fortification wall. In one of the rooms of this enclosure, multiple weights were discovered and a part of a kampanos - a steelyard. The glass weight is circular in shape, with relief decoration, depicting a bust holding an object with its right hand in the air (Fig. 5). Its backside is flat and rough. The let-

ters read ΘΕΟΔωΡΟΥ. It has a diameter of 2.6 cm, is 0.4 cm thick, and weighs 3.91 g.

Two of the Stobi samples (CT-09-69, CT-12-36) belong to the box monogram type, named Type C according to Entwistle, representing the most common form of circular glass weights. Most scholars agree that the box type of glass weights was predominant between 500 and 550 AD, with the cruciform type slowly but surely superseding it through the course of the second half of the century (Entwistle and Meek 2015, 4). This does not mean that the box type glass exagia were not used during the second half of the 6th century AD, as is the case with two Stobi examples.

The third sample (CT-09-68) belongs to the type with a bust of an eparch with an inscription surrounding it. The eparch usually holds a *mappa* - the linen handkerchief thrown to indicate the start of races in the circus games. The inscription reads ΘΕΟΔΩΡΟΥ, probably the name of the eparch that issued the weight. It has been suggested that the person named Theodoros was an official responsible for the royal treasury, called *comes sacrarum largitionum* (Vladimirova-Aladzhova 2008, 248) during the reign of Justin II and whose seals were laid on contemporary silver objects (Dodd 1964, 244). Theophanes also mentioned an *eparch* named Theodoros, son of Peter, *comes sacrarum largitionum*, as well as an additional prefect bearing the same name during the reign of the emperor Justin I. The third person with the name Theodoros was prefect of Constantinople in 612, during the reign of Heraclius (Vladimirova-Aladzhova 2008, 245). We have to take into consideration that these are only the officials that we know the names of, as opposed to so many that we are unfamiliar within the entirety of the Byzantine Empire. For this reason, I can not be certain in connecting this glass weights' inscription to any of the previously mentioned possibilities, although they remain viable options.

The type with the bust of an eparch and an inscription belongs to Type B according to Entwistle, and it is dated widely because of the possibilities in comparing the names with officials documented in historical sources. The generally accepted date range for this type is between the reigns of Justin II and Heraklios (Entwistle and Meek 2015, 4).

Discussion

Glass *exagia* have been unearthed at various places in the eastern Mediterranean, in Constantinople, at other sites in Asia Minor, Egypt, Crete, Cyprus, along the Danube, etc. One shop in commercial contexts in Sardis has yielded three glass weights, stamped with cruciform monograms, discovered along other coin weights, a copper alloy steelyard with a lead weight, as well as fragments of balance and pans (Crawford 1990, 86). They were also found in commercial contexts in Israel, notably in Tel Naharon, where there are several sets of weights of glass, bronze, and haematite, as well as at the site of Shiqmona, where three glass weights have been discovered (Entwistle and Meek 2015, 3). Glass weights were found throughout the Balkans: in Bulgaria, at least eleven samples (Vladimirova-Aladzhova 2008); in Serbia, at least two samples (Ivanišević and Jovanović 2018); in North Macedonia, at least four samples - three presented in this paper and an additional one from *Heraclea Lyncestis* (Lilčić 2001), etc.

The appearance of the glass coin weights is strongly connected to the widespread fiscal and administrative reforms initiated by the emperor Anastasius and continued by Justinian I. The reforms included a revamping of the copper coinage that saw the introduction of major denominations such as the follis and half follis, and an increase in the number of mints, which subsequently led to a proliferation in the circulation of the gold coinage, exemplified by increased releases of the nomisma and its divisions, the semissis and tremissis (Grierson 1982, 4). It is through this monetary reform that the initial introduction of glass as a material used for coinage weights may have taken place (Entwistle and Meek 2015, 1).

Glass weights vary in color; they are found in shades of blue, brown, red, green, and yellow (Vikan and Nesbitt 1980, 36–37). The advantages of glass as a material over the metal have been stated many times, as it is easy to manufacture, it is readily detectable if tampered with and it is not prone to immediate oxidation or corrosion (Entwistle and Meek 2015, 2). This makes it ideal for smaller denomination coin weights.

Their precise function has been disputed, but the most likely interpretation is that they were used for weighing gold coins. The state issued a gold coin of full weight, as well as fractions thereof, one-half and one third. Glass weights obviously did not compete with bronze flat weights, since they were a very specific tool for weighing the full weight or the fractions of a gold coin. They were very useful for small transactions and were thus used as a complement to their heavier, metallic counterparts. After an examination of the weights of over two hundred glass weights, the eminent Arab numismatist, George Miles, concluded that glass pieces were used for weighing the solidus weighing around 4.55 grams, the semis, weighing ca. 2.27 grams, and the tremissis, weighing around 1.55 grams.

In the Theodosian Code 12.7.1, there is an explanation on how these transactions occurred, and it is explicitly explained how to hold the scales in order to achieve a fair measurement: "when gold is paid, it shall be received with level pans (*aequa lance*) and equal weights (*libramentis paribus*) in such a fashion, naturally that the end of the cord (*summitas lini*) is held with two fingers, the remaining three being free and extended toward the tax-receiver (*susceptor*) so as not to depress the weights (*pondera*) by restraining either of the pans suspended from the tongue (*examen*) of the balance, but so as to permit the level and equal movement of the balance (*stater*)" (Morrisson 2012, 386–387).

The actual weighing was done by a state official called *zygostates*, "the one who weighs with a balance". This official not only weighed, but also verified the quality of the gold coins (Morrisson 2002, 913). In the 6th century, during Justinians' reign, the *zygostatai* were singled out in one of his aedicts as responsible for changing the purity of gold coins (Kazhdan *et al.* 1991, 2232).

There are many questions related to the identification of the official who was responsible for the emitting of a distinct type of *exagia* and it is evidenced by the great variety of monograms (Bendall 1996, 60), related to the names of eparches not only in Constantinople but in all provinces of the Byzantine Empire as well (Feissel 1986; Bendall 1996).

Assumedly, traders acquired glass weights in Constantinople and carried them about in their travels (Vikan and Nesbitt 1980, 37). A hoard of glass weights discovered in Sardis in Asia Minor, challenges this claim however, since Fulghum and Heinz believe that the 21 glass weights bearing monograms of Heraclius are local products, based on the imperfect physical appearance and asymmetrical shape (Fulghum and Heintz 1998, 115).

As indicated by the numerous inscriptions on surviving exagia, other officials not mentioned in the imperial legislation also were involved in the issuance of weights. In the western provinces, *proconsuli*, *viri laudabiles* and *viri clarissimi*, and *anthypatos*, *comes* and *ephoros* in the eastern provinces. Chapter 15 of Novel (CXXVIII) 128 of Justinian, dated to 545 AD, states that the praetorian prefect of the city was responsible for the commodity weights and the Count of Sacred Largesses (*comes sacrarum largitionum*, κομες των θείων θησαυρών) as well as coinage weights of gold, silver and bronze. The *comes* was also responsible for minting all coinage except silver and gold, and until Justinians' reign, the procurators of the mints remained in his authority (Morrisson 2002, 911). All weights and measures were now "to be preserved in the most holy church of each city" (Morrisson 2012, 385). The role of the church as a depository and guarantor of weight standards was very important, and it was closely connected to the influence of bishops as leaders of cities (Paunov 2005, 99). The role of the church in practicing honest weighing and assaying is well exemplified by

an edict proclaimed in Alexandria by John the Almsgiver, on his accession to the patriarchate in the early seventh century (Morrisson 2012, 385–386).

The weight of the glass weights from Stobi is 3.93 g and 4.35 g for the box monogram ones, and 3.91 g for the e*xagium* with a bust of an eparch. The 4.35 g *exagium* is the one closest to the theoretical weight of the solidus, which is 4.55 g. The sample weighing 4.35 g was used for weighing *solidi*, which is the closest comparison in terms of coin weights. For comparison, there are 5 samples of *solidi* discovered at Stobi, weighing between 4.38 g and 4.50 g, minted during the reigns of Justinian and Justin II (Radić and Ivanišević 2006). As can be deduced from the information above, the weight of the glass exagium from Stobi fits the parameters of the weight of the solidi discovered in the city, with a minimal inconsistency.

The remaining two samples weigh less than the aforementioned weight for the *solidi*. There is a possibility that they were used for weighing light-weight *solidi*. The function of these light weight gold coins still eludes modern scholars, even though they have gained significant attention in the last few decades (Gökalp and Gandilla 2015, 323). Their average weight is difficult to determine precisely, but it is always less than 4.00 g, which contributes toward the determination of the function of the two glass weights from Stobi, weighing 3.93 g and 3.91 g, as weights for light-weight *solidi* (Adelson 1957; Hendy 1972).

Additionally, the five *tremissis*, discovered along fragmented bronze scale pans in one of the shops behind the Semicircular court in Stobi (Nikolovski 2018, 319), all vary in weight minimally, even though four out of five were part of the same emission, during the reign of Justin II, issued in Constantinople, but they still represent approximately one third of the weight of the *solidi*. It should be noted that the weight of the *tremissis* was very small to begin with, and it would have been nearly impossible to notice the weight difference from its theoretical weight.

Conclusion

Glass weights were used during a short period of time of approximately 150 years in the 6th and the first half of the 7th century AD throughout the Byzantine Empire. In general, the prosopographical evidence for the dating of glass weights ceases at the same time when the glass-producing provinces Syria, Palestine and Egypt were lost to the Arabs, by the middle of the 7th century AD. The coinciding with the so-called transitional series of glass weights from Egypt in the period between 642 and 692 AD, contributes to this idea (Entwistle and Meek 2015, 12; Entwistle 2016, 293). The tradition was continued by their Arabic counterparts, issued in vast numbers by successive dynasties from the Umayyads to the Ayyūbids (Balog 1976).

The presence of glass exagia in Stobi contributes greatly toward the general picture of the city at the end of the 6th and the beginning of the 7th century AD. It demonstrates that the city and its inhabitants were commercially active, even if the city did not live up to its urbanistic peak. Although a small amount, in combination with other finds connected to measuring and weighing, the glass *exagia* from Stobi offer an insight to the importance of weighing of solidi, the basis of the monetary system of the Byzantine Empire.

Summary

The three glass weights that are the focus of this paper, were discovered in the context of the last period of urban life in Stobi. The first sample (CT-09-69) was discovered in the context dated to the second half of the 6th century AD. The glass weight was made of light greenish glass, has a diameter of 2.1 cm, is 0.5 cm thick and weighs 393g. The second sample (CT-12-36) was discovered in a closed deposit, on a floor level in Storage room 9; it was made of pale, yellowish glass, has a diameter of 2.15 cm, its thickness varying between 0.64 and 0.84 cm, and weighs 4.35 g. The third glass weight is circular in shape, with a relief decoration, depicting a bust with its right hand in the air, holding an object. The letters read ΘΕΟΔωΡΟΥ. It has a diameter of 2.6 cm, its 0.4 cm thick, and weighs 391 g

Glass exagia have been unearthed at various places in the eastern Mediterranean and the Balkans. The appearance of the glass coin weights is strongly connected to the widespread fiscal and administrative reforms initiated by the emperor Anastasius and continued by Justinian I. Glass weights were used during a short period of time of approximately 150 years in the 6th and the first half of the 7th century AD throughout the Byzantine Empire. The presence of glass exagia in Stobi contributes greatly toward the general picture of the city at the end of the 6th and the beginning of the 7th century AD. It demonstrates that the city and its inhabitants were still commercially active.

Povzetek

Članek predstavlja tri steklene uteži, ki so bile najdene v kontekstu zadnjega obdobja urbanega življenja mesta Stobi. Prva najdba (CT-09-69) izhaja iz konteksta datiranega v drugo polovico 6. stoletja. Utež je izdelana iz rahlo zelenkastega stekla, ima premer 2,1 cm, db. 0,5 cm in težo 3,93 g. Drugi primerek (CT-12-36) je bil najden v zaprtem kontekstu, na hodni površini skladiščnega prostora 9; izdelan je iz stekla rahlo rumenkastega odtenka, ima premer 2,15 cm, db. med 0,64 in 0,84 cm, teža znaša 4,35 g. Tretja utež je kroglaste oblike; ima reliefni okras, ki predstavlja doprsno figuro z dvignjeno desnico, v kateri drži predmet. Utež nosi napis ΘΕΟΔωΡΟΥ. Premer uteži je 2,6 cm, db. 0,4 cm, njena teža je 3,91 g
Steklene uteži so znane z več najdišč vzhodnega Sredozemlja in tudi Balkana. Najdbe steklenih uteži za kovance so tesno povezane z obsežnimi fiskalnimi in administrativnimi reformami cesarja Anastazija, ki jih je nadaljeval tudi Justinijan I. Steklene uteži so bile v uporabi relativno kratek čas, približno 150 let, in sicer v 6. in prvi polovici 7. stoletja na območju Bizantinskega cesarstva. Najdbe steklenih uteži (*exagia*) v mestu Stobi dokazujejo trgovsko in gospodarsko aktivnost mesta in njegovih prebivalcev in pričajo o njegovem življenju na koncu 6. in v prvi polovici 7. stoletja.

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