GLASS IN HITTITES

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The presence of glass objects, and consequently the possibility of a glass technology in Anatolia in the 2nd millennium B.C. remains a neglected topic in glass studies. In order to address this issue, the following two questions should be asked:

-First, what is the archaeological and literary evidence for glass among the Hittites and their neighbours during this very early stage in the history of glass?

-Second, what is the likelihood of glass production i.e. the glass making and glass working in Anatolia, especially among the Hittites during the 2nd millennium B.C ?

The answers require a review of the main archaeological and literary evidence in the light of the history of the Hittites.

If we begin by studying ***the historical conditions*** of the time, Hittite contacts with Hurrian State of Mitanni, Egypt, and the west should be analysed.

As it is well-known, the Hurrians formed the basis of the Mitannian State in about the second half of the 16th century B.C. Mitannian land soon stretched from the Mediterranean to the Habur Valley in Syria and eastward to Kerkuk. This region immediately to the south-east of Anatolia is identified with the earliest large-scale production of glass vessels in the 15th century B.C.

After the invention of "glass" as a material at the end of 3rd millennium B.C., it took hundreds of years to produce ***vessels*** made of glass. The earliest glass vessel fragments come from the excavations at Tell Atchana and belong to the Level VI dating from ca. 1595 B.C.[1] By the second half of 15th century B.C. glass vessels attesting to a lively glass industry were discovered in the Hurrian-Mitannian region in many centers such as Niniveh, Nuzi (Yorgan Tepe), Assur, Tell al Rimah, Tell el Fakhar or Tell Brak and Chagar Bazar in the Habur valley[2].

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1 Wooley 1955, p.300, 304 ; Barag 1985, p. 27, 40, no.4, fig. 1, pl. A 4; Moorey 1994, p.193.

2 Barag 1985, p. 36; for the geographical distribution of 2nd millennium B.C. Mesopotamian glass see: Barag 1970, p.135-149; for a group of glass vessel fragments dating from the 2nd millennium B.C. with a Mesopotamian origin in the collection of Istanbul Archaeological Museums see: Atik 1998, p.365-376, pl.89-95; for the glass from Tell Brak see: Oates-McDonald, p.81-87.

The mid 15th century B.C. was exactly the time when the Hittites began to deal with the Mitanni. From the reign of Tuthaliya (1460-1440 B.C.) onwards, the Mitannian state began to decline under the growing power of the Hittites. During the reign of Suppiluliuma, though the Mitannians lost their dominate position, the Hittite king let the state exist under his control as a part of a diplomatic trick against the Assyrians[3].

This situation marks the Hittite military and political power over a region producing the earliest glass vessels and having a considerable glass industry. Therefore, it would not be possible to think that Hittites were unaware of glass and artifacts made of glass.

At about the same time in Egypt, the reigns of the 18th Dynasty pharaohs, Amenhotep III (1402-1366 B.C.) and Amenhotep IV (1366-1335) are regarded as the golden age of the art of glass[4]. In Malkata near Thebes where Amenhotep III founded a new royal settlement there was a number of glass workshops. It has been discovered that a small glass factory was operating even inside the royal palace[5]. Excavations at Tel el-Amarna, the new capital of Amenhotep IV (who is well-known with the name Akhenaten) revealed a large scale glass industry[6]. The art of glass reached to its peak with the famous throne of Tutankhamen. Various colours of glass together with faience, gold and silver were used for the decoration of this masterpiece.

This Golden Age of glass in Egypt was at the same time when the Hittite Kingdom was ruled by Suppilulliuma (c. 1370-1335 B.C.). During his long reign, it has been attested that the Hittites had close contacts with Egypt[7].

Hittite relations with the west seem rather obscure compared with those of Egypt or Mitanni and the problem of Ahhiyawa is still under large discussion. Glass finds from western Anatolian findspots resemble another fashion in arts and crafts which are comparable with the Myceanean artifacts[8].

[3] Darga 1992, p. 17, Akurgal 1995, p. 45.
[4] For Egyptian glass technology see: Moorey 1994, p.194.
[5] Grose 1989, p. 51.
[6] Petrie 1894, p.1, 15-15, 25-27; Grose 1989, p.52.
[7] Suppilulliuma sent many precious gifts to Akhenaten including heavy silver vessels in honour of the pharaoh's accesion to the throne. The relations were not as frienly as this all the time. For instance, the famous letter sent by the widow of Tutankhamen in order to marry one of Suppilulliuma's sons, ended up with a tragedy: Akurgal 1995, p.46.
[8] For the Myceanean glass finds from Anatolia see: Boysal 1964, Çınardalı 1995, Özet 1992, p.115-132, Özet 1998, p.32, no.3 (or, Özet 2000, p.33, no.3).

Along with political and military events providing evidence for Hittite relations with the large glass production centers of the period, we have a number of *written sources* attesting to the presence of "glass" in the Hittite world.

In Mesopotamia, the cuneiform texts containing information on glass and glassmaking in the 2nd millennium B.C. are either economic records and letters or the *word lists* in Sumerian and Akkadian[9]. The majority of cuneiform tablets with instructions for glassmakers comes from the library of Assurbanipal in Niniveh which belong to the 1st millennium B.C.[10].

The earliest word list bearing information on glass and glasslike materials comes from Nippur dating back to the first centuries of the 2nd millennium B.C. The word "anzahhu" was used to express glass in this very early text. In addition to this, the same word was used in a text which is earlier than the Nippur tablet. This is an inventory belonging to the period of the 3rd Dynasty of Ur, i.e. the end of the 3rd millennium B.C. Therefore, "anzahhu" must have been a Sumerian word and a loan word from Sumerian to Akkadian[11]. On the other hand, the Hurrian word for glass was "ehlipakku"[12]. It was suggested that the word "zapzagaia" (or zapzaki, zapziki, zapzagai) were used in Hittite texts in order to express glass or a vessel made of glass[13] but this term does not take place in "standard" glass texts of Mesopotamia or Anatolia[14].

The discovery of a cuneiform tablet (BM 108561) in Hittite found in Boğazköy and acquired by the British Museum in 1913 bearing instructions for glassmaking reveals that the Hittites had the necessary theoretical information to make glass[15]. Although there were some difficulties of interpretation, it was suggested that the text was a prescription for the making of red glass[16]. Since the language used was found atypical for original Hittite texts, it was concluded that this tablet was brought to Boğazköy from the outside, possibly from Syria[17].

A short time after the publication of this text, two other fragmentary tablets (KBo VIII 65 and KBo XVIII 201) were introduced and unlike the first published example, these two were definitely written in Hittite characters[18]. Similar to the Niniveh texts, materials to make glass were listed in these tablets and the word used for glass was"anzahhu". R. R. Riemschneider soon wrote a detailed discussion on these two

[9] Oppenheim 1970, p.9.
[10] Oppenheim 1970, p.22-23.
[11] Oppenheim 1970, p.18-19.
[12] Oppenheim 1973, p.10-11.
[13] Friedrich 1952, p.260; for the discussion on the word "zapzagai" see: Coşkun 1997, p.69-71.
[14] For the nature of standard glass texts see: Riemschneider 1974, p.264.
[15] Oppenheim 1970, p.23, 67-68, pl.10.
[16] Oppenheim 1970, p.67-68.
[17] Oppenheim 1970, p.67.
[18] Oppenheim 1973, p.11.

tablets along with another example of the same type (KUB XLIII 74)[19]. He also drew attention to another similar tablet from Boğazköy, now in a private collection in Frankfurt[20].

Clearly, the evidence provided by these tablets indicates that the Hittites were interested in the ingredients of glass and making glass, and were well aware of glass as a material and objects made of glass. The similarity of Hittite glass texts with their Mesopotamian counterparts reveals that Hittites received the theoretical information concerning glassmaking from Mesopotamia[21]. After the examination of another glass text in Hittite (KBo XXX 55) and judging from the fact that Hittite documents were much earlier than the Ninive texts, Polvani concluded that the Hittites had their own scientific knowledge for the production of glass[22]

If we look through the *archaeological evidence* for glass in Anatolia, the earliest finds coming from the excavations are beads[23].The earliest of glass beads were discovered in Boğazköy and belong to the Büyükkale IV-D phase, dating earlier than 1700 B.C. i.e. the late Assyrian Trade Colonies period.

In addition to this, an important find from Boğazköy is the rectangular glass bead, now in the collection of the Museum of Anatolian Civilizations in Ankara[24] (fig 1a). The same type of glass beads rectangular in shape, and having lengthwise ribs were produced in many sites at western Asia from Iraq and Iran to Azerbaijan, and Turkey, Syro-Palestinian coast and even in Greece and are datable to the second half of 16th to 14th century B.C.[25].

Other centers yielding glass beads are Alişar, Afyon-Yanarlar and Kusura[26]. The beads from Alişar date both from pre-Hittite and Hittite levels. From the Hittite levels of Alişar comes a number of evil-eye glass beads decorated with concentric circles. Since this type of decoration is common on Chalcolithic pottery, it was suggested that the earlier Chalcolithic traditions had been followed in the decoration of Alişar beads[27].

[19] Riemschneider 1974, p.263-278.
[20] Riemschneider 1974, p.266, n.14.
[21] Barag believes that the Hittite scribes were interested in assembling information on glass: Barag 1985, p.29, 38-39.
[22] Polvani 2001, p.1045-1048.
[23] Moorey 1994, p.193.
[24] Boehmer 1972, p.176-177, no.1820, taf. LXIII.
[25] Stern/Schlick –Nolte 1994, p.122-123.
[26] Glass beads from Afyon-Yanarlar: Emre 1978, p.37-39, şek.149, 156, lev.XLIII (Yanarlar Cemetery was dated to the last phase of the Assyrian Trade Colonies period and Hittite Early Imperial period. For Kusura finds: Lamb 1936, p.54; Lamb 1937, p.273.
[27] von der Osten 1937, p.284.

We can conclude that glass beads were known and used in Anatolia well before the production of the earliest glass vessels in the Hurrian-Mitannian region. It also seems clear that the Hittites had imported the glass vessels from the same region to their capital, Boğazköy.

The earliest known glass vessel excavated in Anatolia comes from Boğazköy. The four fragments belonging to the same vessel were found in Büyükkale in 1956 and are now in the Museum of Anatolian Civilizations in Ankara (fig 1b). The fragments belong to a vessel made with the core technique and close parallels come from Assur, Nuzi, Tell al-Rimah and Tell Atchana[28].

Another important glass find from Boğazköy is a female figurine found in the Upper City, Level 1-B (fig.2). This fine piece, dated to the 14th century B.C. could be a depiction of Astarte[29]. It is probably an import from the Syro-Palestinian region to the Hittite capital. Glass female figurines standing on square bases, holding their breasts with their two hands have a large geographical distribution in the ancient world. Parallels to the Boğazköy figurine were found in Nuzi and Tell al-Rimah in Northern Mesopotamia, Hama, Beth Shean, Megiddo, Lachish, Tell Atchana in the Syro-Palestinian region, Kauklia and Milia in Cyprus; Mycenae in Greece[30]. Anatolia can now be added to this long list representing a remarkable range of distribution.

Excavations undertaken under the direction of Prof. Dr. Aykut Çınaroğlu in Kastamonu, Devrekani, Kınık on the north-western corner of the central Anatolian plateau uncovered important metal vessels and a glass rhyton[31]. These finds were dated to the Hittite Imperial period by the excavator. According to the information received from Prof. Çınaroğlu, the glass rhyton was found in the same context as the metal vessels dating to the 13th century B.C.

Apart from the finds from the Hittite sites, there are recorded glass finds from the Bronze Age centers of the western Anatolian region. A neclace of glass beads had been discovered in 1963 in a tomb in Müsgebi near Halicarnassus[32]. Another site yielding glass objects is Panaztepe near İzmir, Menemen[33]. The general characteristics of these glass beads are similar to the type identified as "Myceanean" and they can either be regarded as imports from Greece or local products following Myceanean fashions and techniques in glass[34].

[28] Boehmer 1972, p.174-175, no.1802, taf. LXIII.
[29] Although the figurine was delivered to the Museum of Anatolian Civilizations just after the excavations in 1957 and published by Boehmer in 1972 Boehmer 1972,p.180, no.1861, taf. LXV., the efforts I paid in order to find the figurine again in the museum did not give any results.
[30] Barag 1970, p.188, 199; Moorey 1994, p.193.
[31] Çınaroğlu 1990-1991, p.53-59.
[32] Boysal 1964, p.81-85, Özet 1992, p.114-133.
[33] Çınardalı 1995, p.79-87.
[34] For Mycenaean glass see: Higgins 1961, p.41-43; Haevernick 1963, p.190-193; Vermeule 1967, p.19-31; Mee 1982, p.22.

The presence and importance of glass as a raw material in Mediterranean trade has been revealed by the glass ingots discovered in the Uluburun shipwreck from the southern Anatolian shore in Kaş near Antalya. The Uluburun ingots were made of blue coloured glass, 5-7cm. in diameter (fig.3). The chemical analysis of the ingots revealed that this glass shared similar characteristics with that used in 18th Dynasty Egyptian glass vessels and contemporary Myceanean glass pendants. Tablets found in Tell el-Amarna mention the loading of glass ingots to the ships on the Syrian coast[35]. This suggests that raw glass was being imported ca. 1300 B.C. from Syria-Palestine to Egypt and Greece via the Mediterranean coast of Anatolia[36].

Another shipwreck providing information on the inclusion of glass in the late 2nd millennium B.C. sea trade along the Anatolian coast comes from the wreck of a Phoenician ship which floundered in Cape Gelidonya, ca. 1200 B.C.[37]. Although the main cargo of this ship was bronze and copper, in the section known as Area P, excavators found hundreds of glass beads mixed with some pottery fragments[38]. The ovoid, spherical or disc-shaped glass beads have close parallels in Lachish and Cyprus[39]

Taken as a whole, historical, archaeological and literary evidence indicates that glass was known and used in Anatolia as early as the 2nd millennium B.C. Since glass and glass objects were extremely rare and precious during this very early period in the history of glass, it would be futile to expect a number of glass finds from any of the ancient sites. Its relative rarity does not demonstrate that glass was unknown in Anatolia, unknown by Hittittes but underlines its high-value.

Although none of the evidence presented above proves that glass as a raw material, or in manufactured form, was made in Anatolia during the 2nd millennium B.C., it does present a few clues which indicate that the possibility of early glass production in Anatolia, especially by the Hittites, should not entirely be ruled out.

During the Boğazköy excavations in 1933, a stone mould believed to be used for the production of glass beads was found[40] (fig.4). The discovery of this mould should not be considered an anomaly given the rich resources of Anatolia and the information available on the production of glass. In addition to the Boğazköy mould for beads, fragments of glass beads found in one of the tombs at Yanarlar necropolis

[35] Bass 1986, p.24, 294.
[36] Bass 1967, p.164.
[37] Bass 1967, p.132.
[38] Bass 1967, p.133.
[39] Bass 1967, p.
[40] Boehmer 1972, p.217, no.2229; Barag 1985, p.39, (Barag asks if this mould was an equipment belonging to a travelling glassmaker or a jeweller: p.39, n.90)

near Afyon are believed to have been broken during production[41] while we could argue for the existence of a long tradition of making glass beads in Anatolia, it is highly likely that more complicated productions in glass such as the glass vessels and the glass figurine of Astarte found in Boğazköy were imports. Still, new finds in Anatolian archaeology may force us to reevaluate our evidence and modify our views even on this last issue.

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[41] Emre 1978, p.38, pic. 156 (Yn. 75 25)

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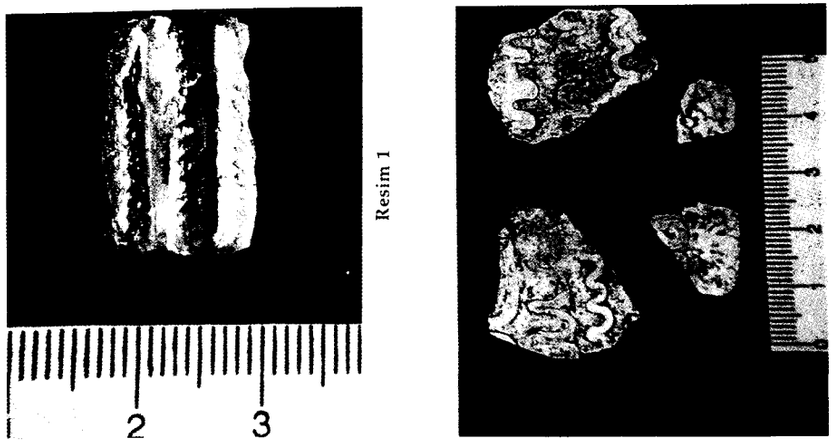

Fig.1a Rectangular glass bead from Boğazköy (Museum of Anatolian Civilizations, Ankara, previously published in: Boehmer 1972, taf.LXIII, no.1820)

Fig.1b Glass vessel fragments from Boğazköy (Museum of Anatolian Civilizations, Ankara, previously published in Boehmer 1972, taf.LXIII, no.1802)

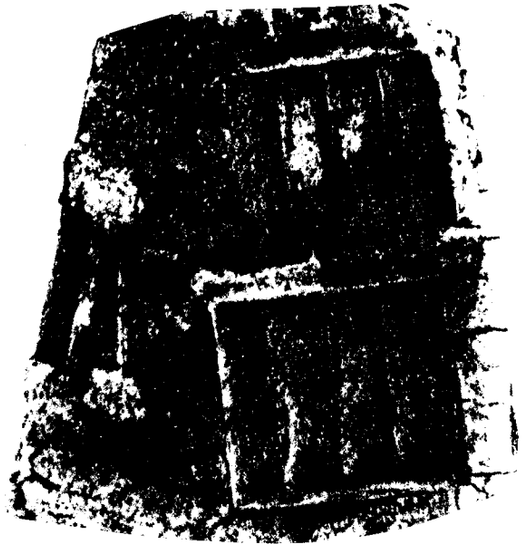

Fig.2 Glass Female Figurine from Boğazköy (Boehmer 1972, taf. LXV, no.1861)

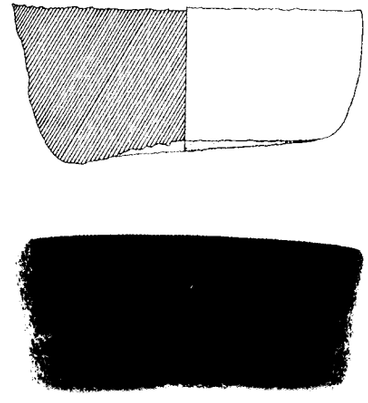

Fig.3 Glass ingots from Uluburun shipwreck (Grose 1989, p.55, fig.21)

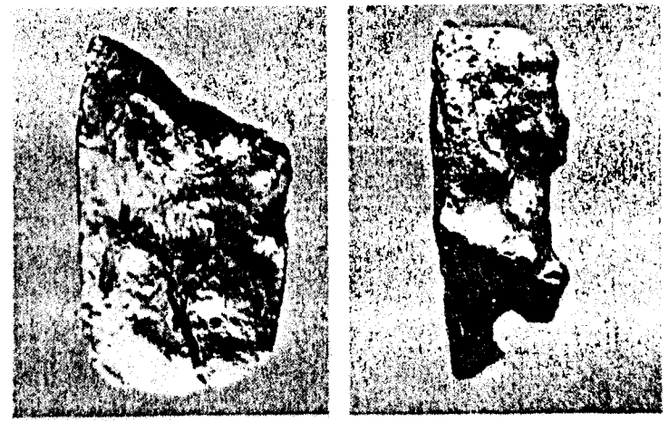

Fig.4 Stone mould from Boğazköy (Boehmer 1972, taf.LXXXVII, no.2229)