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Glass Production and Use in Ancient Mesopotamia, Egypt and Anatolia

Eski Mezopotamya, Mısır ve Anadolu'da Cam Üretimi ve Kullanımı

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Öz

Eskiçağ toplumları ve devletleri, nadir bulunan ve üretimi ustalık gerektiren materyalleri ve ürünleri oldukça değerli bir konuma yerleştirerek kullanmışlardır. İlk üretim merkezinin Eski Mezopotamya olduğu düşünülen cam da üretim zorluğu ve nadir bulunurluğu sebebiyle, ilk olarak Eski Mezopotamya daha sonrasında Eski Mısır ve Eski Anadolu'da oldukça önemli bir konuma yerleştirilmiştir. Cam ilk aşamada, boncuklar, kâseler, vazolar ve şişeler olmak üzere çeşitli ürün modellerinin üretimin de kullanılmıştır. Yapılan çalışmalar, cam kullanımının her ne kadar Eski Mezopotamya toplumunun tamamına yayılmış olduğunu göstermiş olsa da, içeriğinde kaliteli cam oranı yüksek olan ürünlerin daha çok toplumdaki seçkinler tarafından kullanıldığı anlaşılmaktadır. Eski Mısır toplumunda ise, cam tam anlamıyla yüksek zümrede bulunan insanların kullandığı bir materyal olarak değerlendirilmektedir. Eski Mezopotamya ve Mısır medeniyetlerinde, önemli bir emtia olarak kabul edilen camın üretimi ihracatı ve ithalatı siyasal otoritenin tekelinde bulunmaktaydılar. Ayrıca çivi yazılı metinlerden öğrenildiği kadarıyla devletlerarası diplomaside gerçekleştirilen hediyeleşmelerde camdan imal edilmiş ürünler önemli bir yer tutmaktaydı. Bu çalışmada çivi yazılı metinler ve arkeolojik bulgulardan hareketle Eski Mezopotamya, Mısır ve Anadolu uygarlıklarında cam varlığına dair tespit ve değerlendirmelerde bulunulacaktır.

Anahtar Kelimeler: Eski Mezopotamya, Eski Mısır, Eski Anadolu, Cam, Cam Yapımı

Abstract

Ancient societies and states used rare and skilled materials and products, placing them in highly valuable positions. Glass, which is thought to have been first produced in Ancient Mesopotamia, was highly prized and held in important positions in Ancient Egypt and Ancient Anatolia due to its difficulty in production and rarity. In the initial stages, glass emerged in various product models such as glass beads, glass bowls, glass vases, and glass bottles. Although studies have shown that the use of glass was widespread throughout Ancient Mesopotamian society, it was understood that the products with high glass content were mainly used by the high-class people. In Ancient Egyptian society, glass was considered a product for people of high class. In the civilizations of Ancient Mesopotamia and Ancient Egypt, the state monopolized the production activities, export and import of glass by the dynasty. Glass was also exchanged as gifts between states. When we look at the ancient Anatolian geography, it is understood that glass production started in a later period compared to Ancient Mesopotamia and Ancient Egypt, and its role in society is not fully known.

Keywords: Ancient Mesopotamia, Ancient Egypt, Ancient Anatolia, Glass, Glass Making

Introduction

Human communities have developed different cultural and political understandings throughout history within the framework of the physical and human conditions brought about by their geographical locations. In this process, the ancient Mesopotamia region was frequented by many communities due to its important trade route networks and fertile lands fed by the Euphrates and Tigris rivers. Each society that came to the region (Sumerians, Semitics, Gutians, Kassites) brought their unique understanding of life to Mesopotamia and created a cultural richness where local cultural elements and various issues fused. This cultural richness created close ties between cities and states. Thanks to the close ties, the transfer of information between cities could also be ensured, so that the developments occurring in any city in the Mesopotamia region could be transferred to other cities through activities such as trade, population movements, and wars. One of these developments is the production of glass and the use of products made of glass.

According to our current knowledge, glass was first manufactured in Mesopotamia. Glass, which was first produced as simple transparent beads, continued its development as ornaments, daily used glass bowls, bottles, tubes in which cosmetics were stored, and products used in rituals with the development of production technology. Glassware, which has become a product that the upper echelons of society can obtain, has also become a commercial material and one of the valuable gifts sent between states.

Apart from Ancient Mesopotamia, glass production and use were also present in the Ancient Egyptian civilization. As a result of studies, it is understood that the Ancient Egyptian civilization reached glass production technology later than Mesopotamia (Çınardalı Karaaslan, 2013: 16; Loeben, Nolte, and Weethmaan, 2011: 12; Taştemur, 2013: 1). There is, however, one point that is not clear: the question of whether Mesopotamian societies used the same tools and techniques in glassmaking as Egyptian societies or whether they had their own distinct traditions. Studies on glass production in Egypt and Mesopotamia indicate that both regions employed similar methods for glass production. However, despite the use of the same methods, there are regional differences between Egyptian and Mesopotamian glass products (Shortland et al., 2007).

According to our current knowledge, glass production in Ancient Egypt started during the 18th Dynasty, approximately 1500 BC. The Ancient Egyptian civilization, which was geographically surrounded by deserts and far away from external factors, took steps to become a global power during the 18th Dynasty period. In parallel with all these developments, the first activities related to glass in Ancient Egypt were also carried out during this period (Cooney, 1960: 10-11; Nolte, 1971: 167).

Glass became a product of great interest to the society in the Ancient Egyptian civilization, and glass products were valued as much as gold and silver. The production of these products was carried out under the control of the political authority, and the products obtained became status items used by the elite in the society. Apart from daily-use products, glass products were also used as a commercial material and took their place among the gifts sent between states (Ertman, E. L, 2013: 13; Karageorghis, 1995: 76).

Another region that draws attention to the production and use of glass is Ancient Anatolia. It is thought that glass production in this geography developed later compared to the ancient Mesopotamian and Egyptian civilizations. However, some studies on this subject argue the opposite. As a result of excavations carried out in various regions, especially in Boğazköy (Hattusa) and Gordion, glass products were unearthed, and this situation revealed the impression that glass production activities were also present in Ancient Anatolia (Cooney, 1960: 10-11; Karageorghis, 1995: 76; Nolte, 1971: 167; Duncan Jones, 2005: 101; Taştemür, 2018: 205).

Previous studies on the subject of this study have predominantly focused on localized evaluations. These publications typically concentrate on Mesopotamia, Egypt, or Anatolia individually. Furthermore, these publications primarily rely on archaeological findings as the basis for their evaluations. In contrast to these previous works, our study takes a holistic approach by discussing the civilizations of Ancient Mesopotamia,

Egypt, and Anatolia collectively, and comparing their similarities and differences. Additionally, our assessments of archaeological discoveries are supported by quotations from cuneiform texts, thereby presenting a research study that incorporates both written and unwritten evidence.

Glass Production and Use in Ancient Mesopotamia

Mesopotamia is an expression used to describe the region between the Euphrates and Tigris rivers, a large part of which is within the borders of today's Iraq. In the historical process, communities from different regions, especially from the Arabian Peninsula and Asia, migrated to this region. As a result of these migrations, people were culturally mixed with each other. Every development in the Mesopotamia region gradually spread to the whole region, and, as a result of excavations, similar cultural elements were revealed in different parts of Ancient Mesopotamia. One of these similar cultural elements is glass production methods and products.

In the Near East, the oldest known faience materials are dated to the final phase of the Ubaid Period (5500-4000 BC) (Angelini, et al., 2019: 98). According to the data obtained from recent excavations, glass was first produced in the form of transparent glaze in the 4th millennium BC (Taştemür, 2017: 68). Although the history of objects made of glass can be traced back to the 3rd millennium BC, the number and types of glass objects remained limited until the 2nd millennium BC. One of the proofs of this idea is the cuneiform tablet obtained from the library of Ashurbanipal. Information about glass production was found on the tablet obtained from the excavations. Although the tablet was dated to the 1st millennium BC, later studies revealed that it was a copy of the original tablet written in the 2nd millennium BC. This is one of the indicators that glass production activities in the Ancient Mesopotamia region date back to the 2nd millennium BC (Coşkun, 1997: 68; Dardeniz, 2019: 229; Luckner, 1994: 79; Memiş, 2020: 5; Nicholson, 2007: 117).

In addition to the library of Ashurbanipal, a cuneiform tablet dated to the reign of the Babylonian king Gul-kishar (1696-1690 BC) describing the production of colored glass and the content of the products produced, including information about the furnaces used in glass production, was found near the present-day city of Baghdad. Apart from this information, two terms related to the lapis lazuli stone, which is abundant in Mesopotamia, are mentioned in this tablet. One of them is "natural", and the other is "artificial". It is understood from these terms that glass is likened to the artificial form of lapis lazuli stone. Apart from these two texts that provide important information about glass making and use, another tablet dating to the 1st millennium BC mentions glass making as well as the rituals performed before the production begins. These texts and the information obtained from archaeological findings show that glass production in Ancient Mesopotamia started earlier than in Egypt and Anatolia (Eker, 2017: 16; Taştemür, 2013: 1).

When we look at the stages of glass production, it is understood that sand, soda, and limestone were used as raw materials, and these materials were processed by means of crucibles in the production centers established in Eshnunna, Nineveh, Eridu, Tell Atchana, Tell el-Cudeyde, Dinkha Tepe, Nuzi, Tell el-Rimah, and Tell el-Fakkar regions. According to the documents, there are three types of furnaces at different stages in these centers called "bît kûri". The first of these are the furnaces called kûri ša abni. The second one is kûri ša siknat ênâtpel-ša, which are cast furnaces with porous lower parts. The third furnace example is the lidded furnaces called Kûri ša takkani. The heat of these furnaces was provided by burning poplar logs in the first stages. However, the heat could not be kept constant in this method. Due to the technical knowledge of the period and the use of poplar logs, the furnaces could be raised to a maximum temperature of 1000-1100° degrees. However, 1500°C, which is necessary for healthy glass production, could not be reached. For this reason, glass masters used soda to melt the material and bring it into glass form (Eker, 2017: 17; Gündüz, 2002: 35; Hasdemir-Kanyak, 2010: 107-108).

When we examine the techniques used in glass production, the first technique is the casting method. With this method, the glass is melted in crucibles, poured into molds of the desired shape, compressed, and then the desired product shape is obtained. The second method is based on the principle of shaping elasticized glass using a metal rod. The first examples of this technique were uncovered during the excavations at Assur-Nuzi in the second half

of the 15th century BC to the 14th century BC (Eker, 2017: 27-28; Taştemür, 2013: 17-18). According to the information obtained from the glass vessel found during the excavations in Alalakh, the earliest use of glass dates back to around the 1500s BC (Barag, 1962: 19; Matsumura, 2020: 103-104). The mosaic glass bowl fragments recovered from the 13th century BC level of the Alalakh (Tell Atchana) excavations are also significant examples of this technique (Taştemür, 2013: 18). When we examine the materials made using the mosaic technique, a blue bowl with a round mouth, and a deep bowl in which red, brown, green, and white colors are used together draw attention. Another technique is based on gold engraving on glass. This technique is one of the indicators of the status difference in the use of glass mentioned earlier. With this technique, high-value products were obtained by making gold ornaments on transparent glass. Apart from these main methods used to produce artifacts from glass, there are also Sandwich Gold Glass, Strip Mosaic, Lowering-Collapsing-Suspension, Lost-Wax, Glass Sagging, Mould-Blown, Blowing Methods, etc. (Eker, 2017: 27-28; Taştemür, 2013: 18-21; Tek, 2007: 154-155).

The glass vase, found in the city of Tell el-Rimah as a result of excavations and dated to approximately 1450 BC, is the oldest known example of a glass vase in the Mesopotamia according to current knowledge (Gündüz, 2002: 36). The main color of the vase is blue, but there are also yellow and white wavy motifs on it. According to current knowledge, the process of creating colors on the vase and other glass products differs for each color. It was determined that the glass, which was transformed into blue color using cobalt and copper oxide, was also transformed into yellow color by using lead oxide. As a result of studies, it is thought that the motifs on the glassware were created by means of an iron rod while the glass was not yet cooled. As a result of this production process, the first examples of glass objects in Ancient Mesopotamia were produced in the form of transparent solid beads. The glass rod fragments, dated to 2300 BC and unearthed in the excavations of the city of Eshnunna (Tell Asmar), are among the first examples of production (Frankfort, 1934: 57-58). In the following period, Mesopotamian glass masters were able to produce items such as jars, cylinder bottles, bowls, cups, and drinking vessels by shaping the glass. Considering these products, it is evident that glass production technology developed over time (Çınardalı and Karaaslan, 2013: 34; Moorey, 1982: 30).

According to information obtained from cuneiform texts and archaeological findings, the use of glassware in ancient Mesopotamian societies was not limited to a certain segment of society, but rather widespread. When looking at findings from tombs dating back to the Middle Assyrian Kingdom period, it becomes apparent that glassware was not only found in the tombs of high-class individuals but also in the tombs of low-income people belonging to the lower strata. However, the amount of glass products unearthed in the graves of low-income people was much less than that of high-income people, and the glass quality of the products varied significantly, indicating a class difference within society. Furthermore, the glassware recovered from the graves of lower-class individuals in the Ur excavations mainly comprised necklage beads. It is worth noting that these items were not made of pure glass but instead were crafted from materials like faience or lapis. This disparity in the use of glass indicates a distinction between the elites of society and the common people (Woolley, 1934: 370; Oppenheim, 1973b: 262; Çınardalı - Karaaslan, 2013: 38; Zettler, 2020: 25). The expressions *"The ploughmaster of the [palace] giv[es] one glass of car[damom...]"* and *"One glass of cardamom [...] for the use of the chief confectioner of the palace."* in a text dated to the Neo-Assyrian period have an important place in terms of showing that the use of glass occurred at every level of society (SAA 12 77: i 6, ii 16).

Apart from their daily use, glass products were also valued as an export item by the ancient Mesopotamian states. As a result of excavations in Boğazköy, it is thought that glass products were sent from Babylon to the Hittites. Another use of glass products for the states of Ancient Mesopotamia was in the exchange of gifts between states. It has been determined, through finds unearthed as a result of excavations in Gordion, that glass bowls were sent as gifts from Assyria to the Phrygians. This is one of the most important indicators of the value given to glass products (Oppenheim, 1973a: 264; Özet, 1987: 591; Taştemür, 2017: 71).

Another use of glass objects is in religious rituals. It has been observed that glassware was used in both large-scale

religious ceremonies and individual worship, which may be considered as a sign of gratitude. The phrase, *"When you are to strew salt on the bread (and) the [glass ves]sel, [you say]: "May Nikkal accept, may Kidin[birbir listen]!" You return and treat the gods."* found in a text dating to the Neo-Assyrian period, is significant in showing the use of glassware in rituals (SAA 20 37: 20).

Glass Production and Use in Ancient Egypt

Ancient Egypt was a civilization that developed around the Nile basin and relied on the river for its livelihood. Due to its geographical location, the Egyptian civilization remained isolated from external factors and had a unique religious, cultural, military, and architectural structure compared to other communities of the time, including Ancient Mesopotamia and Anatolia.

The history of Ancient Egypt was divided into historical periods: the Pre-Dynastic Period, Archaic Period, Old Kingdom, First Intermediate Period, Middle Kingdom, Second Intermediate Period, New Kingdom, Third Intermediate Period, and Late Period. These divisions were the result of political events experienced by the civilization. The New Kingdom period marked a turning point for Ancient Egypt as it opened up to the outside world in military, political, and commercial terms.

Until the New Kingdom period, Egyptian civilization was not influenced by external sources and continued to develop in accordance with its geography. It developed its own materials and models in various fields such as astronomy, mathematics, construction, medicine, and production. One such material and model was the production and use of glass.

According to current knowledge, glass production in Ancient Egypt began after 1500 BC, which is a later period compared to Ancient Mesopotamia. In fact, glass production in Ancient Egypt started in the 18th Dynasty period according to the chronology of Ancient Egypt (Bianchi, 1983: 29; Nicholson, 2007: 1-3). One of the important examples of glassware of this period is the scarabs. The glassy scarab dating to the time of Tuthmosis III (1479 – 1425 BC) and the scarab with granular and carved interior dating to the time of Amenhotep II (ca. 1427–1401 BC or 1427–1397)are noteworthy examples of glass objects. These objects can be characterised as glassy faience (Lilyquist and Brill, 1995: 9). Believed to possess magical powers and hold significant importance in religious ceremonies, scarabs were also highly valued as commodities for export. These scarabs, often regarded as symbols of luck and protection in other regions, were imported and replicated within Minoan and Mycenaean cultures. Among these imported objects, a scarab that also served as a seal stands as the oldest known artifact of its kind (Schlick-Nolte, et al., 2011: 37)

When analyzing glass production in ancient Egypt, it is observed that the production was completely monopolized by the dynasty. During the reigns of Amenophis III (1390-1353 BC) and Amenophis IV (Akhenaton) (1353-1336 BC), glass production workshops were established in Malkata and Tell el-Amarna under the palace. Excavations have revealed approximately 750 pieces of glass materials in Tell el-Amarna, and although the exact number is unclear, it is believed that three or four glass production facilities were found. Additionally, two large glazing workshops were discovered in these workshops. Apart from the cities of Malkata and Tell el-Amarna, it is known that there were glass production workshops in the city of Qantir in the 13th century BC (Bower, 2005: 388; Hasdemir and Kanyak, 2010: 109; Pusch and Rehren, 1999: 172; Vanthuyne, 2012/2013: 397).

Glass production in ancient Egyptian civilization was accomplished by melting materials such as iron oxide, quartz sand, silica, lime, copper, and sand in crucibles made of terracotta in the aforementioned workshops. Through studies conducted on the subject, it has been determined that there are some differences in the proportions of these raw materials used in ancient Egypt compared to modern glass production. Specifically, the silica and lime ratios were lower and the iron oxide ratio was higher than in modern glass production. The main reason for this difference is related to the melting temperature. In glass production, materials are melted at 1500°C and shaped into glass form. However, since it was not possible for the aforementioned melting pots to reach this

temperature with the technology available during ancient Egyptian times, the proportions of the materials were altered and the heating temperature was reduced to 1000°C to melt the raw materials into glass form. Subsequently, the melted raw materials were rapidly cooled to obtain amorphous glass material, which could then be shaped and utilized for various purposes. In the glass shaping stage, the object to be covered with glass is first formed. The formed object is then attached to an iron rod and inserted into the melted glass in the melting pot, and covered with glass. Afterwards, the model covered with glass is heated and rotated around its own axis to obtain a smooth surface. Materials with motifs are made by adding motifs onto the hot glass with rod-like tools and then rotating it. Apart from adding motifs, the material can also be shaped with iron rods while it is still hot. These processes result in the production of various types of vases, ornaments, vessels, lamp vessels, hanging lamps, various symbols, and beads. Additionally, glass figurines from the period of Amenophis III and a glass mask made by removing the face print of Akhenaton were also unearthed as a result of excavations (Bianchi, 1983: 30; Gündüz, 2002: 34; Hardwick, 2013: 117; Rehren, 2000).

Various products were obtained during the early periods of glass production and processing methods. However, in the following periods, this process turned into three main production models. The first of these is the single-handled circular jug and jug called oenochoe. These products were used for filling and transporting various liquids. The second is the alabastron, a narrow, elongated bottle with a narrow head, which was formed by compression with cylindrical tools, and these bottles were generally made to hold fragrances. The third vessel form is the amphora, which has a wide body, a narrow neck, a pointed bottom, two handles, and a lid. These materials, which were formed in the three different forms mentioned above, are generally blue in color and decorated with various motifs. When we look at the reliefs and decorations on them, it is seen that festoon, palm leaves, and monkey figures are used, although not frequently, with a wavy line structure made using yellow and white colors (Eker, 2017: 41; Gündüz, 2002: 253).

Various products were produced during the early stages of glass production and processing. However, over time, this process evolved into three main production models. The first is the single-handled circular jug called oenochoe, which was used for filling and transporting various liquids. The second is the alabastron, a narrow elongated bottle with a small head that was created by compressing cylindrical tools, and these bottles were typically made to hold fragrances. The third vessel form is the amphora, which has a wide body, a narrow neck, a pointed bottom, two handles, and a lid. These items, which were crafted in the three different forms mentioned above, are generally blue in color and decorated with various motifs. Upon examining the reliefs and decorations on them, it is apparent that festan, palm leaves, and monkey figures are used, although not frequently, with a wavy line structure created using yellow and white colors (Eker, 2017: 41; Gündüz, 2002: 253).

These products, which were produced in ancient Egyptian civilization and used by the elite members of society in their daily lives, also had a commercial value for both the domestic market and for export. Based on information obtained from written texts and archaeological findings, it is understood that glass was exported to various regions, particularly Alasia (Cyprus), during the reign of Amenophis III. The challenges associated with glass and glass material production, as well as the privileges granted to owners of these products, suggest that the state was involved in exports (Karageorghis, 1995: 75-76).

When looking at the Amarna letter EA 148, which is a response from Abi-Milku, likely a governor, to the king's letter, it can be understood that the first letter sent to Abi-Milku by the king requested for glass. The text in question includes the following expressions:

To the king, my lord, [m]y god, my Sun: Message of Abi-Milku, your servant: I fall at the feet of the king, my lord, seven times and seven times at the feet of the king, My lord, have I fallen. The king, my lord, has written concerning raw glass that I have. I have given to the king, my lord, one hundred shekels worth… (Moran, 1992: EA 148 1-8; Rainey, 2015: EA 148 1-8).

Similarly, letters numbered EA 235, 314, 323, and 331 contain correspondence between the king and governors named Sitanna, Pur-Batu, Yidya, and Shipti, respectively. In letter EA 323, written by a person named Yidya to the king, the following statements are made regarding this matter:

To the king, my lord, my god, my Sun god, the Sun from heaven: Message of Yidia, your servant, the dirt at your feet, the groom of your horses. At the two feet of the king, my lord, verily prostrated myself seven times and seven times, on the back and on the stomach. I am guarding the [pl]ace (temple?) of the king, my lord, and the city of the king, just as the king, my lord, the Sun god from heaven, has said. Inasmuch as the king, my lord, spoke about raw glass, behold, I have sent to the k[ing], my [lord], thirty(?) (pieces) of raw glass.… (Moran, 1992: EA 323 1-16; Rainer, 2015: EA 323 1-16).

Glass Production and Use in Ancient Anatolia

Our first information about the production and use of glass in ancient Anatolia was obtained as a result of excavations in Alalah. Crucible fragments used in glass production were found during the excavations. In addition to the Alalah finds, a tablet related to glass production was also discovered in Boğazköy (Hattusa). When the content of the tablet is examined, there is information on the production of glass, the transformation of glass into a product, and the color of the glass. The tablet refers to glass as “Zapzagai” or “Zapzaki” by the Hittites. Additionally, the text mentions "Babylonian stone." The reason for this expression may be that the glass product mentioned is blue in color, and blue is specific to the lapis lazuli stone, which was abundant under Babylonian rule. This suggests that there was an interaction between the Babylonians and the Hittites, or there was a gift exchange between the states. It has also been suggested that the Hittites borrowed glass-making techniques from Babylon, hence the term “Babylonian stone”. Despite the tablet found in Boğazköy, which gives information on glass production, excavations did not reveal a glass production facility belonging to the period, and the concrete products obtained were only simple transparent glass beads. This situation brings to mind the idea that there may not have been glass production in the Hittite country, and that the existing glass products may have been brought to the Hittite country through trade, booty, or gift-giving methods. (Dardeniz, 2019: 234; Taştemür, 2018: 205 70-71 Tek, 2005: 110).

As a result of excavations in Anatolia, materials related to glass were found not only in Boğazköy and Alalah. Excavations at Afyonkarahisar-Kusar and Yanarlar, Alisar, Gaziantep-Saraga mound, and Gordion yielded fluted beads (with a hole in the center) dating back to the 2nd millennium BC. In the necropolis of Çavlum, various blue-colored beads dating back to the 17th century BC were found. These beads found in the necropolis were also found during excavations in various regions of Anatolia. After these excavations and the dating of the excavated products, it is known that there were glass products in Anatolia until 1200 BC. However, there is no data on glass in Anatolia between 1200 BC and the 9th century BC. After the period between these dates when glass production was interrupted in ancient Anatolia, as a result of excavations carried out in the regions within the borders of the Urartu State, various glass beads and remains of glass production workshops were found. Thus, it was understood that the presence of glass in Anatolia was seen again in the 8th century BC. (Eker, 2017: 17; Saldern, 1959: 26; Taştemür, 2018: 105).

The glass bowl, recovered during excavations in Gordion, the capital of the Phrygian Kingdom, dates back to the 8th century BC and is recorded as the first glass bowl found in Anatolia. However, it is thought that this bowl is not of Anatolian origin. The fact that the structure of the bowl is very similar to the Assyrian bowls brings to the forefront the idea that the product was sent to the region by Assyria. Anatolian societies, which were behind Egypt and Mesopotamia in terms of production technology, entered a significant development process in terms of glass processing skills since this date. To make the shapes on the produced objects recognisable in detail, glass coating was applied on the shapes, and the casting technique was developed, and the first glass bowls of Anatolian origin were produced. The discovery of glass bowls dating back to the 1st century BC, as a result of the studies carried out in Gordion, is one of the examples of the development process of glass production in ancient Anatolia. In

addition to the bowls found in Gordion, the fact that crucibles used in glass making were found during the excavations is another evidence for the existence of glass production in Anatolia. Although glass production gained momentum in Anatolia with this process, when the raw materials of the glass obtained as a result of the studies are analyzed, it is thought that these materials were brought from Assyria. The reason for this is the predominance of lead oxide and copper used by the Assyrians in glass making in the production materials of the products unearthed in the Urartian excavations. (Atik, 2004: 31; Eker, 2017: 17-18; Özet, 1987: 592-596; Saldern, 1959: 26; Tek, 2005: 11-12). As a result of the excavations, over 170 fragments associated with glass production through the core process were discovered in Gordion. The glass production activities at Gordion employed core-forming, which is one of the oldest methods for creating glass vessels. The significance lies in the fact that this technique originated in Northern Mesopotamia around 1500 BC, indicating the influence of Assyrian effect on Phrygian glass production (Duncan Jones, 2005: 101-103).

Conclusion

Based on the study and information obtained, it is understood that glass was considered a high-quality product that revealed class differences within society. It held such an important position that it was the subject of tablets, especially in Mesopotamian and Ancient Egyptian civilizations. The difficulty of production and visual beauty of the products obtained from glass probably explain why they were so valuable.

From the findings, it is clear that glass production was generally overseen by political authorities and carried out in workshops in regions such as Babylon, Nineveh, Eridu, Tell Atchana, Tell el-Cudeyde, Dinkha Tepe, Nuzi (Yorgan Tepe), Tell el-Rimah, Tell el-Fakkar in Mesopotamia, and Malkata, Tell el-Amarna, and Qantir in Egypt. Archaeological data shows that glass production was carried out with different methods and types of furnaces in workshops. Societies in the region diversified their products by developing these furnaces over time.

With the development of production techniques, cups, glasses, bottles, and ornaments were produced for daily use, and these products had different colors and patterns. Glass was also among the gifts sent as part of inter-state relations, and it was used as a commercial product by the states of the period. Information obtained from written and archaeological data shows that glass was exported from Ancient Mesopotamia and Egypt to other regions. The Amarna letters indicate that commercial activities were carried out between Ancient Egypt and Cyprus for glass and its raw materials. Additionally, the glass bowl obtained from the Gordion excavations and dated to the 8th century BC is an indicator of inter-state trade and diplomacy. Mycenaean and Minoan finds are another indication of this interaction.

When we look at the Ancient Anatolian civilizations, it is understood that the production and use of glass were more limited compared to the Ancient Mesopotamian and Ancient Egyptian civilizations. Some opinions put forward as the reasons for this situation are that glass production in Anatolia was very late, and that society adopted the colored stones obtained by making use of various mines found in Anatolia. For this reason, interest in glass was low. Different opinions, on the other hand, claim the opposite and argue that glass production in Anatolia was distributed to various regions and that the public was interested in these products. The scarcity of available information on the production of glass and glassware in ancient Anatolia makes it difficult to conclude whether glass or glassware was produced as early as in ancient Mesopotamia and Egypt. However, when the data obtained as a result of various excavations are evaluated, it is concluded that glass production workshops and kilns in Ancient Anatolia were operating as workshops using advanced techniques by the 8th century BC.

As a result of the evaluations made within the scope of the study, it was observed that the ancient Mesopotamian, Egyptian, and Anatolian civilizations used similar methods in terms of production technologies, although they achieved sophistication in glass production and its use during different periods. This situation reveals that there was interaction between these geographical regions. Besides the interaction that emerged through political and commercial relations among the civilizations of Ancient Mesopotamia, Egypt, and Anatolia, it can be seen that the

production and use of glass were influenced by ancient cultures in the Aegean Islands and Ancient Greece. This situation clearly demonstrates that these civilizations had an impact not only on each other but also on other regions.

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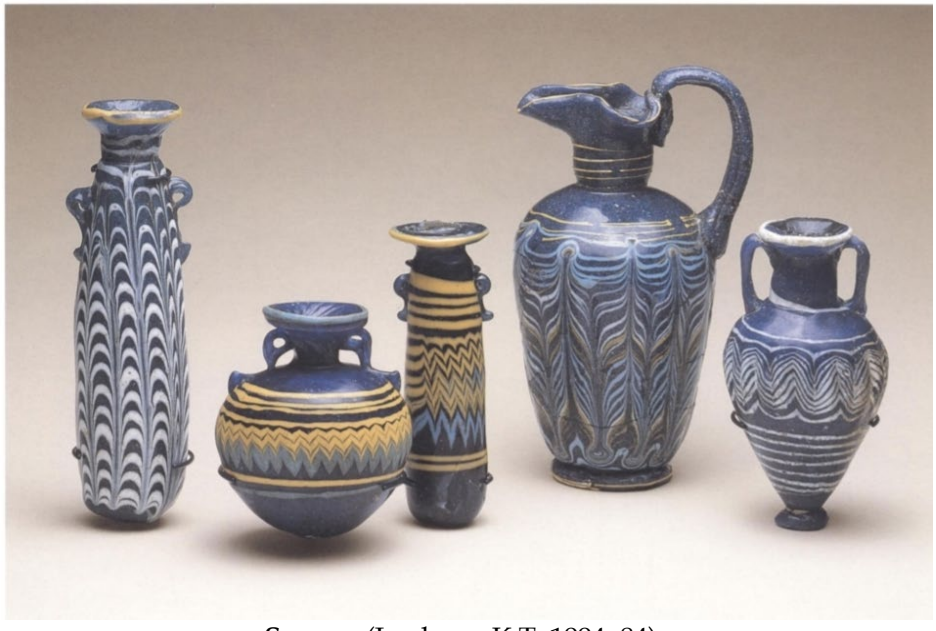
Appendix

Fig 1. Rim disc and thread-decorated rod-shaped glass Ancient Egypt New Kingdom Period 18th or 19th Dynasty (1400-1225 BC).

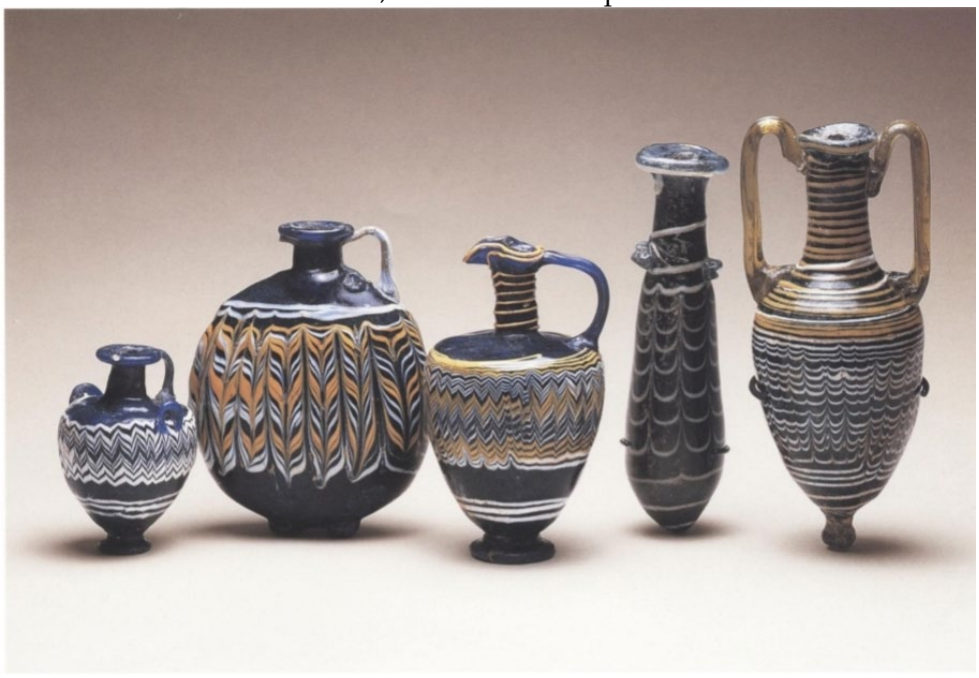
Source: (Nicholson, 2007: 82).

Fig 2. Left to right: Alabastron, Aryballos, Alabastron, Oinochoe and Amphoriskos.



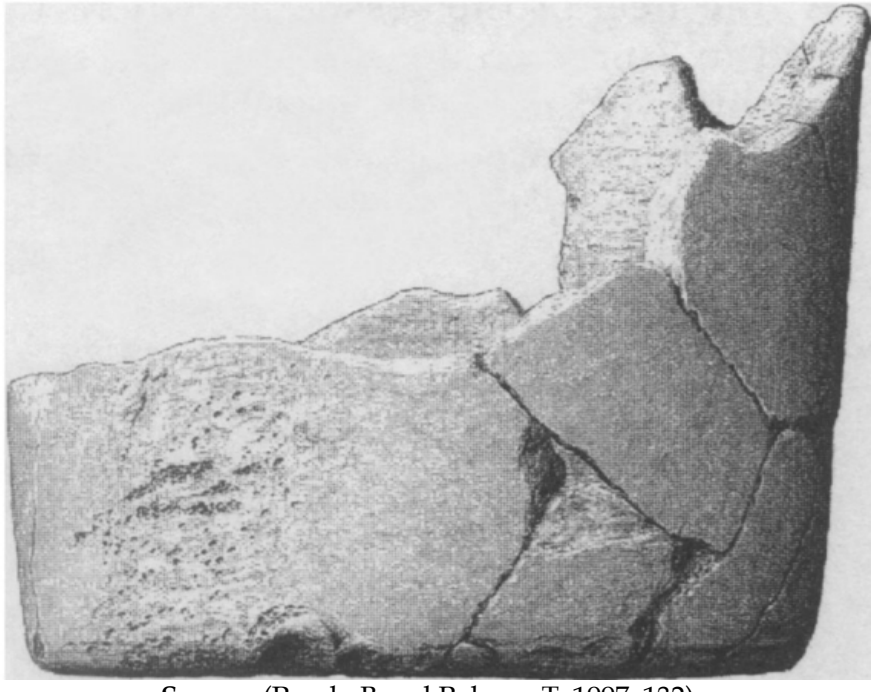
Source: (Luckner, K.T, 1994: 84).

Fig 3. Left to right: Hydriske, LentoidAryballos, Oinochoe, Alabastron and AmphoriskosAlabastron, Aryballos, Alabastron, Oinochoe ve Amphoriskos.



Source: (Luckner, K.T, 1994: 85).

Fig 4. Glass Melting Pot. Qantir/Ancient Egypt



Source: (Pusch, B and Rehren, T, 1997: 132).

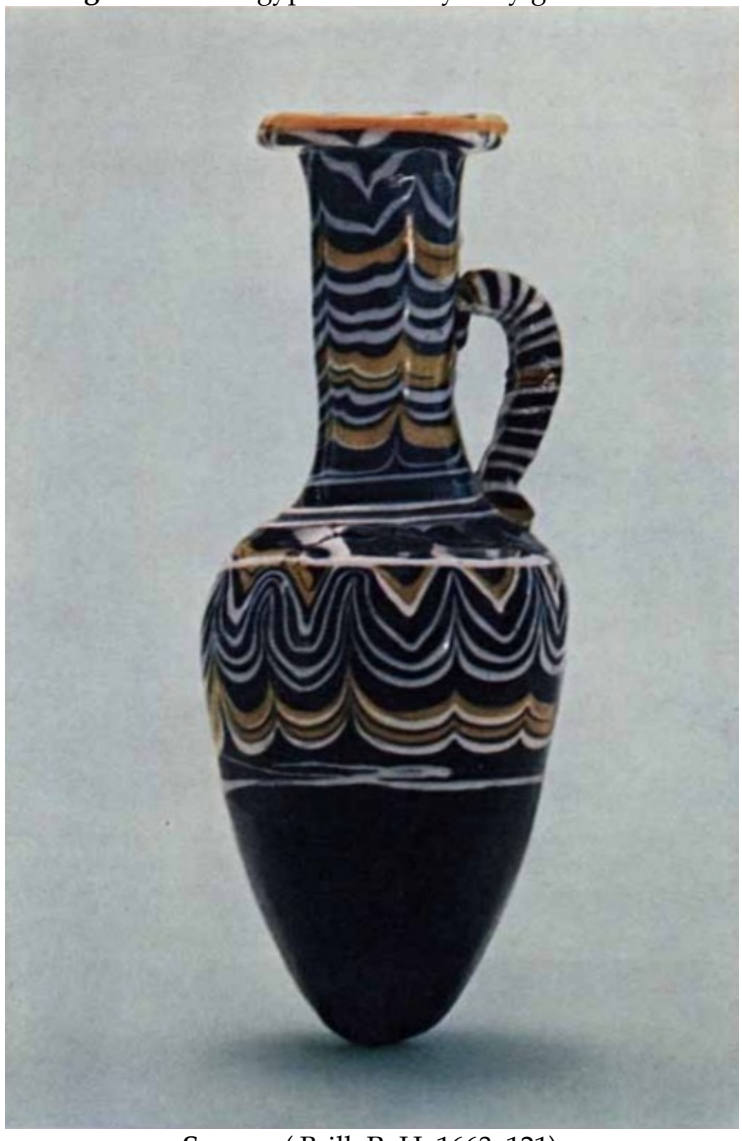
Fig 5. King Akhenaten's blue face mask made of glass.

Source: (Ertman, E. L, 2013: 14).

Fig 6. Turquoise glass bowl dating to Thutmose III

Source: (Loeben vd., 2011: 18).

Fig 7. Ancient Egyptian 18th Dynasty glass vessel.



Source: (Brill, R. H, 1663: 121)

Fig 8. Glass vase from Tell el-Rimah.

Source: (Iraq Museum - Baghdad)

Yazar Katkıları: *Fikir %30-70; Tasarım %50-50; Denetleme%50-50; Kaynaklar %30-70; Veri Toplanması ve/veya İşlemesi %70-30; Analiz ve/ veya Yorum %70-30; Literatür Taraması %50-50; Yazıyı Yazan %60-40; Eleştirel İnceleme %40-60*
Hakem Değerlendirmesi: *Dış bağımsız.*
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