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Dergisi 3(2014) 103-110*
*F. V. Güngördü / Nevşehir Hacı Bektaş Veli University Journal of Social Sciences
3(2014) 103-110*

OBSDIAN AND ITS SIGNIFICANCE FOR CAPPADOCIAN PRE-POTTERY NEOLITHIC

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ABSTRACT

During prehistoric times, due to its natural structure and impressive color, obsidian was a common material for tool production. As a result of chemical analyses, scientists are capable for source analyses on obsidians which have unique elemental compositions in every different sources. By means of these analyses, which obsidian sources were exploited to produce obsidian tools can be identified. This information is significant for archaeologists in the process of realizing inter-regional connections.

Cappadocia region is one of the significant obsidian sources in the Near East. Cappadocian obsidians were exploited and manufactured by local Pre-Pottery Neolithic sites and they were diffused in Syria, Levant and Cyprus. The identification of Cappadocian obsidians in different regions of the Near East is important to show the connections between Syria, Levant, Cyprus and Cappadocia in 10.000 years ago.

Keywords: Obsidian, chemical analyses, Pre-Pottery Neolithic, Near East, Cappadocia.

OBSDİYEN VE SERAMİKSİZ NEOLİTİK DÖNEM'DE KAPADOKYA İÇİN ÖNEMİ

ÖZET

Prehistorik çağlarda hem doğal yapısı hem de etkileyici rengi sayesinde obsidyen alet üretiminde sıkça kullanılan bir hammaddedir. Kimyasal analizler sonucunda ana kompozisyonunun anlaşılabilceği obsidyenin, farklı kaynaklarda farklı birleşenleri içerisinde barındırması bilim adamlarına kaynak analizi yapma imkânı sağlamaktadır. Bu sayede farklı yerleşimlerde ele geçen obsidyen aletlerin üretiminde, hangi doğal kaynakların kullanıldığı saptanabilmektedir. Bu bilginin arkeologlar açısından önemi ise, yazının olmadığı prehistorik çağlarda bölgeler arası ilişkilerin obsidyen üzerinde yapılan bu analizler sonucunda saptanabilmesidir.

Yakındoğu'nun en önemli obsidyen kaynaklarından biri Kapadokya bölgesidir. Kapadokya obsidyenleri günümüzden 10.000 yıl önce hem bu bölgedeki yerel Seramiksiz Neolitik Dönem yerleşimleri tarafından kullanılmış hem de Suriye, Doğu Akdeniz ve Kıbrıs gibi Yakındoğu'nun diğer bölgelerine de yayılmıştır. Yakındoğu' da farklı bölgelerde Kapadokya obsidyenin saptanması, Kapadokya'nın

Kıbrıs, Suriye ve Doğu Akdeniz bölgeleri ile günümüzden 10.000 yıl önceki ilişkilerini göstermesi açısından önemlidir.

Anahtar Kelimeler: Obsidyen, kimyasal analizler, Seramiksiz Neolitik, Yakınođu, Kapadokya

I. OBSIDIAN AND ITS CHEMICAL CONFIGURATION

For prehistoric times, long before the existence of writing systems, scientists must rely on materials which are available to understand the prehistoric inter-regional connections. For that reason obsidian has a crucial significance in Near Eastern archaeology

The term obsidian derives from the Roman named Obsius who lived in Ethiopia (Balkan-Atlı, 2008: 191). Categorized as a glass, obsidian consists of 70% silicon dioxide which is related to rhyolite and granite, and also some non-silicious materials (Balkan-Atlı, 2008: 191; Whittaker, 1994: 69). Obsidian results from the rapid cooling of molten rock after a volcanic eruption. If the molten rock does not cool rapidly enough, crystals separate and the rock loses its glass quality (Whittaker, 1994: 69).

Obsidian mainly has a black or green color. Emergence of these different colors is related to the oxidation status of the chemical elements. For example the existence of magnetite causes a black color or hematite a reddish color and iron a green (Balkan-Atlı, 2008: 191).

Especially in prehistoric times, obsidian was seen as perfect raw material for tool production. Due to its more delicate nature relative to other materials, obsidian can have a finer cutting edge. Consequently it is used to manufacture blades and projectile points, (Whittaker, 1994: 69).

Geochemical analyses allow us to identify the elemental composition of obsidian samples. Archaeologists can use these signatures to locate the source of the raw material. Hence archaeologists can infer the inter-regional connections in prehistoric times by means of these geochemical analyses (Andrefsky, 2000: 41-42, Leute, 1987: 101).

Scientific studies on obsidian started in 1960s and continued to develop in more recent years (Shackley, 2008: 199). Today different geochemical analysis techniques (such as X-Ray fluorescence spectrometry (XRF), Particle included X-ray emission analysis (PIXIE), Electron used microprobe analysis (EMPA) and Instrumental neutron activation analysis (INAA) are using on obsidian. Each technique requires different samplings and provides different information (Andrefsky, 2000: 43).

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II. OBSIDIAN SOURCES IN THE NEAR EAST

In the Near East, Anatolia, Caucasia and some Aegean islands contain obsidian deposits. Obsidian from Caucasian sources tends to be found mainly at Transcaucasian sites. On the contrary, Anatolian obsidians appear at many different regions in the Near East (Chataigner, Poidevin, Arnaud, 1998: 518).

Obsidian sources in Anatolia can be separated into different groups based on location: Central Anatolia, Southeastern Anatolia, Northeastern Anatolia, Northern and Western Anatolia (Renfrew, Dixon, Cann, 1966: 33)

III. OBSIDIAN SOURCES IN CAPPADOCIA

In Cappadocia, obsidian deposits are known in the provinces of Nevşehir, Niğde, Aksaray, east and south-east of the south end of the Tuz Gölü (Todd, 1980: 30). In the Acıgöl area, Kaleiçi, Acıgöl, Güneydağ, Kocatepe-Acıgöl and Hotamış Dağ are the main obsidian sources (Todd, 1980: 30). The Acıgöl and Çiftlik deposits are the oldest obsidian beds in Anatolia (Ercan, Şaroğlu, Kuşcu 1994: 506). Obsidian sources in the Göllü Dağ region (Niğde, Melendiz plain) are known from the Kömürcü Köyü area, Sırça Deresi and Kayırlı (Todd, 1980:33). According to the chemical analyses, Göllü Dağ obsidians can be divided into two different groups as Göllü Dağ-East and Göllü Dağ-West (Chataigner, Poidevin, Arnaud 1998: 525-526). Moreover Nenezi Dağ contains a high dome with a large obsidian flow on its western bank and there are some highly poisonous Barium-rich obsidian sources exist in Hasan Dağ (Karakapı and Tahtayayla) (Ercan, Şaroğlu, Kuşcu, 1994:506).

IIIa. Cappadocian Pre-Pottery Neolithic Sites and Obsidian

As it mentioned above, Cappadocia region contains numerous obsidian sources. These different obsidian deposits were exploited by both Cappadocian Neolithic sites and also some other Near Eastern Neolithic sites.

In Aksaray province Aşıklı Höyük is one of the better known Pre-Pottery Neolithic settlements. The architecture of Aşıklı Höyük consists of clustered rectangular mudbrick dwellings, streets, alleys and also some monumental buildings (Esin, 2000: 22-24; Esin, Harmankaya, 2007: 268).

The chipped stone industry of Aşıklı Höyük is mainly based on obsidian. Nenezi Dağ and Kayırlı obsidian deposits were exploited by Aşıklı Höyük's inhabitants. Knapping occurred both at these sources and also at Aşıklı Höyük (Esin, Harmankaya, 2007: 266). The chipped stone

assemblage contains cores, blades, bladelets, small triangles, lunates, arrowheads, scrapers and burins (Balkan-Atlı, 1994: 221).

Musular which is located only 300/400 m. northwest of Aşıklı Höyük, is another Pre-Pottery Neolithic site in Aksaray province with significant obsidian artifact deposits (Özbaşaran, 2000a: 129). The Pre-Pottery Neolithic architecture of Musular consists of Building A, units N and Z, and some rock-cut and built channels (Özbaşaran et al, 2007: 274).

As at Aşıklı Höyük, the chipped stone industry of Musular is mainly obsidian and the raw material can be sourced to Göllü Dağ and Nenezi Dağ obsidian sources. The chipped stone assemblage there contains cores, flakes, blades, scrapers, arrowheads, borers and burins (Kayacan, 2003: 7, Özbaşaran, et al, 2007: 276, Duru, Özbaşaran, 2005: 22-23).

Kömürcü Kaletepe which is located on the northern slope of Göllü Dağ on a rhyolitic formation is an obsidian workshop where both the exploitation and knapping processes were carried out (Balkan-Atlı et al. 1999: 3, Balkan-Atlı, Binder, 2001: 1). This site contains both Middle-Paleolithic and Pre-Pottery Neolithic layers (Balkan-Atlı, Binder, 2007: 218).

Kömürcü Kaletepe has a unique type of naviform bidirectional core which has not been found on any other Anatolian Neolithic sites (Balkan-Atlı, Binder, Cauvin, 1999: 138). These cores were used to produce bidirectional blades which are significant to manufacture arrowheads. Moreover the site also yields prismatic blade production assemblages. According to Nur Balkan-Atlı and Didier Binder these two different production techniques require a high proficiency (Balkan-Atlı, Binder, 2001: 12, Balkan-Atlı, Binder 2007: 219).

IIIb. Cappadocian Obsidians in the Near East

In the Near East, Cappadocian obsidians were found in Syria, Levant and Cyprus. In terms of diffusion, evaluations can be classified in two different aspects.

Firstly, as a raw material, Cappadocian obsidians have been found in Syria, Levant and Cyprus. Göllü Dağ obsidians have been identified at Syrian Pre-Pottery Neolithic sites such as Mureybet, Cheikh Hassan and Jerf el-Ahmar. They also were recovered from the well-known Southern Levantine Pre-Pottery Neolithic site of Jericho as well as the Cypriot Neolithic site Khirokitia (Chataigner, Poidevin, Arnaud, 1998: 523-525, Renfrew, Dixon, Cann, 1968: 325). In addition, Kömürcü obsidians were found at some Syrian Pre-Pottery Neolithic sites such as Dja' de, Mureybet and Halula (Balkan-Atlı et al. 2000: 46, Balkan-Atlı, Binder, 2001: 14). Kömürcü examples have been identified in another Cypriot Neolithic site,

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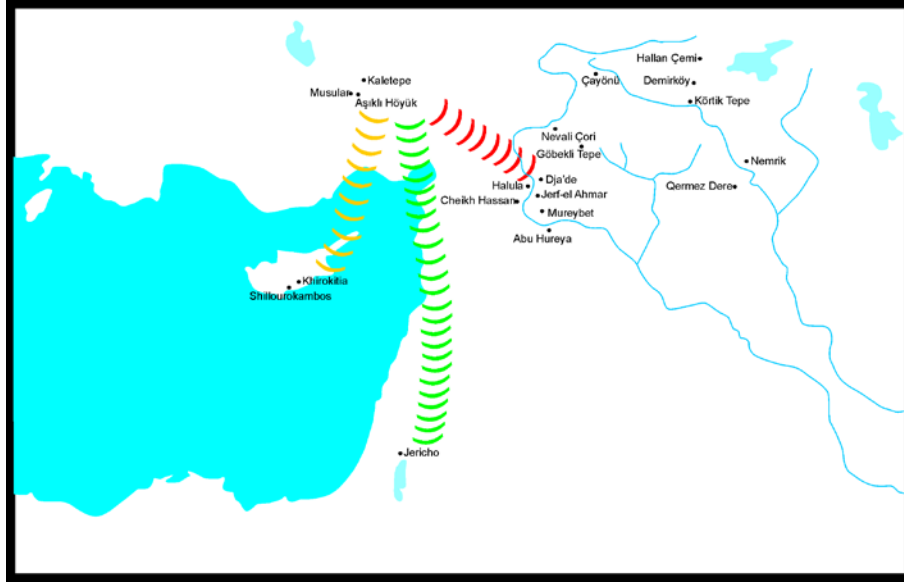
Shillourokambos (Balkan-Atlı et al. 2000: 46, Balkan-Atlı, Binder, 2001: 14, Briois, Gratuze, Guilaine, 1997: 105).

Secondly, in terms of knapping techniques, the Kömürcü Kaletepe obsidian workshop produced two types of blades: bidirectional and prismatic. Although bidirectional blade production has been documented in Syria and Levant at sites the Kaletepe style has only been recovered at Dja' de. Prismatic blade production has been identified in Syria and Cyprus at sites such as Mureybet, Tell Halula and Shillourokambos (Balkan-Atlı et al. 2000: 46, Balkan-Atlı, Binder, 2001: 14).

VI. SIGNIFICANCE OF OBSIDIAN IN CAPPADOCIAN PRE-POTTERY NEOLITHIC CONTEXT

Obsidian is one of the common materials for tool production especially in prehistoric times due to its fascinating color and natural structure. Its fingerprint quality is crucial for archaeologist when the process of understanding the interregional connections in prehistoric times when long before the writing systems exist. By means of source analyses on obsidian, archaeologists can identify the sources and then establish a relation between the source location and the archaeological context where the finished product belongs.

The Cappadocia region has a significant role in the Near East for 10.000 years due to both its central location and its possession of valuable raw materials. In particular Cappadocia was one of the most significant obsidian producing areas of the entire Near East. Geochemical analyses show that Cappadocian obsidians reached in Syria, Levant and also Cyprus revealing long distance cultural interactions 10. 000 years ago. Moreover their presence at the Cypriot Pre-Pottery Neolithic sites Shillourokambos and Khirokitia indicate maritime connections between Cappadocia and Cyprus during earlier periods.



Map: Diffusion of the Cappadocian Obsidians 10.000 years ago

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