

## A NOTE ON THE PROVENANCE OF BLACK WHEEL-MADE VESSELS FROM A BURIAL CAVE WEST OF TEL ḤAZOR

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This article presents the results of the petrographic analysis of Intermediate Bronze Age Black Wheel-Made Ware (BWMW) vessels from a burial cave located west of Tel Ḥazor, and of vessels from the same assemblage that are considered to be typical of the Intermediate Bronze Age ceramic repertoire of the region. The BWMW is a high-quality ware with a dark surface, often decorated with white painted stripes. The repertoire of BWMW forms is limited to goblets, cups, jars, kraters, teapots and bottles (Bechar 2015). The ware was first identified at Megiddo (Guy 1938:148). Its distribution seems to be largely restricted to northern Israel, e.g., Ḥazor, Megiddo, Tel Na'ama, Qedesh and Ha-Gosherim (Tadmor 1978; Covello-Paran 1996; Greenberg et al. 1998), and particularly to the Ḥula Valley (Bechar 2015). It is less frequently found in the northern Levant, e.g., in the Beqaa Valley in Lebanon (Tel Ḥizzin; Genz and Sader 2008), the Lebanese coast (Byblos and Tyre; Bikai 1978) and Syria (e.g., Yabrud, Tell Nebi Mend; Abou Assaf 1967; Genz 2010; Philip Graham, pers. comm. 2013). The burial cave under discussion is related to the Intermediate Bronze Age village or small town of Tel Ḥazor, where a significant large and diverse assemblage of BWMW was discovered (Bechar 2015).

Several attempts were made to track the origin of this ware in Syria and Lebanon on the basis of typo-morphological criteria (e.g., Tadmor 1978; Dever 1980:46–52; 1995:287; Bunimovitz and Greenberg 2004), but hardly any analytical studies were carried out. Petrographic analysis of BWMW from Tel Na'ama in the Ḥula Valley, carried out by

Yuval Goren, indicated a clay source in the Lower Cretaceous formations, which outcrops at the foot of Mt. Hermon and in the Lebanon and anti-Lebanon Mountains (Greenberg et al. 1998:23).

The BWMW vessels stand out in their high quality of manufacture and firing attributes, and in their fine, thin walls. Hence, the ware was considered to be the product of a full-time specialized production center within the urban cultural sphere of Syria and Lebanon (Tadmor 1978; Greenberg et al. 1998; Genz 2010). Naked-eye examination of BWMW from sites in Israel, such as the site west of Tel Ḥazor, Tel Ḥazor, Megiddo and Tel Na'ama, shows their fabric to be entirely different from that of other vessels that were found in association with them. This is also true for Tel Ḥizzin in the Beqaa Valley in Lebanon (Herman Genz, pers. comm. 2013). Bechar (2015) suggested a provenance in the Ḥula Valley, mainly based on their prevalence in that area.

The aims of this study are to identify the raw materials that were used to manufacture the selected vessels, determine their geological sources and assess possible geographic regions of manufacture.

### *Method and Samples*

Studies of pottery workshops determined that ancient potters used local clays and temper, and the fabric of the vessels should therefore reflect the geology of the production site. After an assessment of the geological setting of Ḥazor and the surrounding area, the results of the petrographic analysis were compared to the local lithology and to the comparative

collection of thin sections of the IAA. This vast collection spans sites throughout Israel, as well as other parts of the Levant.

Comparison with previous petrographic analysis results of pottery and clay tablets from Ḥazor was also undertaken, as an indication of local raw materials that were used at this site during the Bronze Age (e.g., Shenhav 1964; Goren 2000; Goren, Finkelstein and Na'aman 2004; Zuckerman, Ziv-Esudri and Cohen-Weinberger 2009). The material was also compared with petrographic descriptions of hand specimens of clay and wadi sand that were collected from the area around Ḥazor (Goren, Finkelstein and Na'aman 2004).

The BMWV vessels that were selected for petrographic analysis include three teapots (Getzov, this volume: Fig. 9:8–10), a cup (Getzov, this volume: Fig. 9:6) and fragments of a spout (L107, B102), a base (L108, B1025) and a rim (L108, B1025). Other vessels that were analyzed include two lamps (Getzov, this volume: Figs. 9:3, 5) and an amphoriskos (Getzov, this volume: Fig. 9:2).

#### *Geological Setting of the Site*

The rock units that are exposed at Tel Ḥazor and its vicinity were studied by Sneh and Weinberger (2006). The bedrock of the mound is of Pliocene to Pleistocene conglomerate and interbedded chalk units known as the Ḥazor–Gadot Formation. Basalts are exposed on the northwestern edge of Tel Ḥazor (Sneh and Weinberger 2006). In the immediate surroundings of the mound there is a series of Turonian to Eocene carbonates with sporadic appearances of chert beds, and Pliocene to Pleistocene basalt series.

#### *Results*

*BMWV.*— The raw materials of all the BMWV vessels are homogeneous and characterized by a highly ferruginous matrix. The non-plastic inclusions, ~15% of the ceramic paste, exhibit a bimodal grain-size distribution. The fine fraction consists of 5–10% silty quartz grains, and silt to fine sand-sized rounded iron oxides.

The coarse fraction, ~10% of the ceramic paste, consists of rounded to sub-angular quartz grains, usually ~200 μm and rarely up to 700 μm, and of rounded limestone fragments, ~250 μm, that appear milky or decomposed to varying degrees.

The identification of the raw material, and its provenance, is unclear. A comparison with thousands of thin sections from the IAA collection revealed no parallels. Calcareous marls and soils are the most characteristic raw material for pottery in ancient Israel. The exceptions are several soil types and clay units such as the non-calcareous Lower Cretaceous clay. The occurrence of sand-sized quartz grains supports a Lower Cretaceous source, but other petrographic characteristics that appear in thin sections of vessels made of the Lower Cretaceous formations—such as argillaceous clay, elongated ferruginous and argillaceous shales, siltstone fragments and oolites (for description see, e.g., Greenberg and Porat 1996)—are missing from these samples.

*Other Vessels.*— Two lamps (Getzov, this volume: Fig. 9:3, 5) and an amphoriskos (Getzov, this volume: Fig. 9:2) are characterized by foraminiferous clay. The microfossils indicate Senonian to Paleogene Age. The non-plastic inclusions, ~15% of the ceramic paste, contain rounded chalk and limestone fragments, as well as rounded porphyritic basalt fragments with alteration of the phenocrysts to iddingsite. The basalt fragments have fine plagioclase crystals and their matrix is sometimes vitrophyre. Discrete iddingsite and chlorite grains appear in the matrix. The chlorite grains are yellow-brown with a fibrous radial texture. A few chert and sparitic limestone fragments appear in the paste.

The matrix and the inclusions' assemblage indicate an area in which calcareous and basaltic formations are exposed. The non-plastic components were most probably collected from the wadibed of Naḥal Ḥazor. The raw material used for the vessels corresponds to the lithology exposed in the area of Ḥazor.

*Concluding Remark*

This study indicates that the BMWW was produced from clay that is as yet unknown in other ceramic wares in Israel. This raw material is totally different from that used for

the common Bronze Age pottery at Ḥazor. This fact may point to a foreign origin; however, to be precise, it mainly demonstrates the necessity of a comprehensive comparative provenance study of this ware throughout the Levant.<sup>1</sup>

## NOTE

<sup>1</sup> A petrographic study of BMWW from Tell Nebi Mend and the surrounding Homs District is to be

conducted by Kamal Badreshany (pers. comm. 2013).

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