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Petrographic Analysis of Pottery from the Early Bronze Age Tomb 80 in the 'En Esur Cemetery

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The purpose of this study was to determine the provenance and nature of the raw materials used to manufacture the Early Bronze Age pottery assemblage recovered in Tomb 80 at 'En Esur (see Gorzalczany and Sharvit, this volume). Twelve samples were selected from the assemblage for petrographic analysis (Table 1).

For the present analysis, it was important to first assess the geologic setting of the site, located on the southern fringes of the Menashe Hills (Umm el-Faḥm Hills). The area is covered mostly with chalk and marl of the Senonian-Paleocene Mount Scopus Group and by Quaternary alluvial sediments (Sneh, Bartov and Rosensaft 1998). Chalk and chert rocks of the Eocene Maresha and 'Adullam Formations outcrop on the syncline of the Menashe Hills, in close proximity to the site. The Umm el-Faḥm area, located south of Naḥal 'Iron, is an anticline characterized by Cenomanian and Turonian carbonatic rocks (limestone and dolomite) accompanied by some volcanic intercalations, such as basalt and tuff (Picard 1956; Sass 1968:115–116).

Table 1. Petrographically Analyzed Pottery Samples from Tomb 80

No.	Locus	Basket	Fig. No. (see Gorzalczany and Sharvit, this volume)
1	177	1538	Fig. 10:2
2	178	1592	
3	178	1659	Fig. 10:11
4	178	1702	
5	178	1644	Fig. 10:6
6	178	1615	
7	178	1625	Fig. 12:12
8	178	1624	Fig. 10:9
9	177	1539	Fig. 10:3
10	178	1617	Fig. 10:8
11	178	1628	
12	170	1520	Fig. 12:11

Results

Most of the samples (Table 1:1, 2, 5–9, 11, 12) are characterized by b-fabric with weak optical orientation. The matrix, which is somewhat carbonatic, also contains carbonate in its silty fraction. A few foraminifera, often silicified, appear in the clay. The usual non-plastic components (f:c ratio $_{\{0.062mm\}}$= ~90:10)[1] comprise fragments of diverse rock types, including limestone, chalk, *nari*, basalt and tuff (c. 300 μm in size), as well as quartz grains, crushed calcite and grog fragments. Elongated voids in the matrix indicate the use of straw as temper, which vanished in the process of firing. In some samples one component is dominant, for example Sample No. 6, in which basalt and tuff fragments are dominant, and Sample No. 8, with crushed calcite as the main non-plastic component. The raw material used for all these samples is unidentified marl and the non-plastic components reflect the geological environment of the site.

Two other samples (Table 1:3, 10) are characterized by a foraminiferous (sometimes silicified) matrix with appearances of aquatic mollusk shells. The non-plastic components (f:c ratio $_{\{0.062mm\}}$= ~70:30) comprise coarse, rounded limestone and chalk fragments of up

to 2 mm in size, as well as some chert, tuff and grog fragments. The lithological assemblage of these samples also reflects the general geological environment of the site. One additional sample (Table 1:4) contains the same non-plastic assemblage as the other examined vessels, including crushed calcite, basalt, tuff, grog, quartz grains and some chert, although the matrix is argillaceous with strong optical orientation and rich in opaques.

The results of the current petrographic study indicate that various types of clay were used to manufacture the pottery in T80, and the non-plastic components in all samples were probably quarried in the general region of the site. This correlates well with the modest characteristics of the tomb and its contents, which are attributed by the excavators to the relatively low socio-economic status of the deceased, i.e., the 'common people' (see Gorzalczany and Sharvit, this volume).

NOTE

[2] The f:c ratio exspresses the relative proportions of the fine (f) and coarse (c) components of a fabric. In this case, the ratio (=0.062 mm) represents the boundary between silt and sand size (Kemp 1985:22).

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