

PERSONAL ORNAMENTS AT THE NAHAL MISHMAR CAVE OF THE TREASURE



View of the lower canyon of Nahal Mishmar, as seen from the mouth of the Cave of the Treasure. Photograph by B. Langford.

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The Chalcolithic period in the southern Levant (ca. 4500–3800 B.C.E.) witnessed a few major social, economic, and cultural developments in comparison to preceding Neolithic cultures (e.g. Rowan and Golden 2009). Sedentary populations increased greatly and settlements flourished in areas previously only sparsely occupied, including the northern Negev and the lower Jordan valley, the latter housing the type-site of Teleilat Ghassul, after which the cultural horizon Ghassulian is named. Subsistence of permanent villages was based on intensified agricultural production, including horticulture and animal husbandry, the latter of which were exploited not only for flesh, but also for secondary products, such as milk and hair. Increased specialization is attested in pottery and lithic production, stone working, and ivory carving. Innovation is observed in a large variety of material spheres and in artistic representations with metallurgy being the most innovative of all crafts (Golden 2008). Late Chalcolithic metallurgy became world-renowned in 1961 due to the discovery of a hoard containing over 400 objects, inside a natural cave in Nahal Mishmar, a dry canyon in the Judean Desert (Bar-Adon 1980; figs. 1 and 2). While the hoard from the “Cave of the Treasure,” as it came to be known, was the focus of numerous investigations pertaining to its metallurgic technology, artistic milieu, and socio-cultural attribution

(Sebanne et al. 2014 and references therein; Goren’s article in this issue); other artifactual categories found in the cave, as well as the cave’s environment and stratigraphy, were only briefly discussed in the excavation report (Bar-Adon 1980).

The Cave of the Treasure constitutes an integral part of the Ghassulian Chalcolithic presence in hard-to-access caves located in the cliffs of the Dead Sea escarpment in the eastern margins of the Judean Desert, investigated during the last 60 years (Davidovich 2013). Two main interpretations for this phenomenon were suggested over the years. Some scholars view the caves as herders’ shelters or storage installations related to seasonal movements of semi-nomadic pastoral groups (e.g. Gates 1992), while others believe that the caves served as a temporary refuge place for groups of people fleeing from the sedentary areas in turbulent times (e.g. Ussishkin 1980). A recent regional inspection of this phenomenon, conducted by one of the authors (Davidovich 2008), supports the refuge model based on the spatial and morphological traits of the cliff caves. The Cave of the Treasure contains the most diverse and abundant remains of all the caves and was a major site for the population that fled to the Judean Desert, which may have been the reason for the concealment of the hoard in this particular cave. The hoard itself is viewed as the accumulated wealth of a community, possibly stored in a shrine

prior to its deposition in the remote cave (Ussishkin 2014; Sebanne et al. 2014).

Despite the comprehensive research surrounding the hoard, little is known about the community that owned it. Therefore other artifact categories found in the cave are of utmost significance, especially those reflecting socio-cultural and economic processes, such as personal ornaments. In light of recent developments in the study of the latter during the Chalcolithic periods (Bar-Yosef Mayer et al. 2004; Rowan et al. 2006; Bar-Yosef Mayer and Porat 2010; Pickard and Schoop 2013; Bar-Yosef Mayer and Porat 2013) and given the cultural significance of the Cave of the Treasure, we decided to restudy the collected assemblage. The new insights discussed below enhance our understanding of personal ornaments and their socio-economic role in the Chalcolithic southern Levant.

PERSONAL ORNAMENTS FROM THE CAVE OF THE TREASURE

Three excavation seasons were conducted at the Cave of the Treasure between 1960 and 1962. During the first two seasons several personal ornaments were collected from the excavated deposits: three shell pendants, one trapezoidal stone palette, and an unknown number of small beads made of faience, agate, shell, and lapis lazuli which were only partially reported and illustrated (Bar-Adon 1980: 150–52, Ill. 22, 24). All artifacts were assigned a Chalcolithic date, although their exact stratigraphic context is unknown since the cave was not excavated using discrete spatial/stratigraphic units and lacked sufficient field documenta-



Figure 1. Location of the Cave of the Treasure in Nahal Mishmar. Photograph by B. Langford.

tion. While some objects were collected from the “Chalcolithic layer,” according to Bar-Adon’s final stratigraphic scheme, others were found in the “intermediate layer” (Bar-Adon 1980) and could not be assigned to any period with certainty. It should be stressed that apart from Chalcolithic remains, a few Early Bronze Ib sherds (Davidovich 2013) and a large collection of Roman period artifacts were found inside the cave, the latter mostly in the uppermost layers (Bar-Adon 1980).

The entire personal ornaments assemblage is currently stored in the Israel Antiquities Authority (henceforth IAA) storerooms and was partially presented in the original publication. Very few bead assemblages from the Ghassulian Chalcolithic have been studied and published in detail (e.g. Bar-Yosef Mayer and Porat 2013, Rowan et al. 2006), and to date, no scientific treatment of the subject exists in the literature. Thus, the small but diverse bead assemblage from the Cave of the Treasure constitutes an important contribution to the growing database of Levantine Chalcolithic beads.

Glossary for Bead Terminology

Glazed Enstatite: A synthetic material based on a mineral composed of magnesium silicate (also known as soapstone or talc). This is a very soft material, but after heating becomes very hard. Glazed enstatite was made by crushing the steatite and adding water to form a paste, mixing it with various components including glazing material, and heating it at high temperatures (over 900°C) to form enstatite (Bar-Yosef Mayer et al. 2004; Bar-Yosef Mayer and Porat 2010).

Shell: The exoskeleton of mollusks composed of calcium carbonate (CaCO₃). There are several classes of mollusks, the most common in the archaeological record of the Chalcolithic southern Levant being gastropods (snails) and bivalves. Some shells have a shiny inner shell layer referred to as nacre, also known as mother-of-pearl; this is found on the three pendants from the Cave of the Treasure.

Mohs Scale: A scale that compares hardness of minerals, with 1 being the softest (talc) and 10 the hardest (diamond). For example, flint, the most common raw material used by prehistoric humans (hunting, cutting, drilling etc.) is made of quartz and measures 7 on the Mohs scale. Carnelian, another type of quartz, is of the same hardness.

Stone Beads: Three stone types were discovered at Nahal Mishmar: limestone (calcite), usually white or off-white in color, occurs locally in the southern Levant; carnelian, a translucent mineral made of quartz and usually red or orange in color, possibly found as pebbles in the Negev or Sinai; and lapis lazuli, a stone which is mostly blue and known in antiquity to come from Afghanistan.

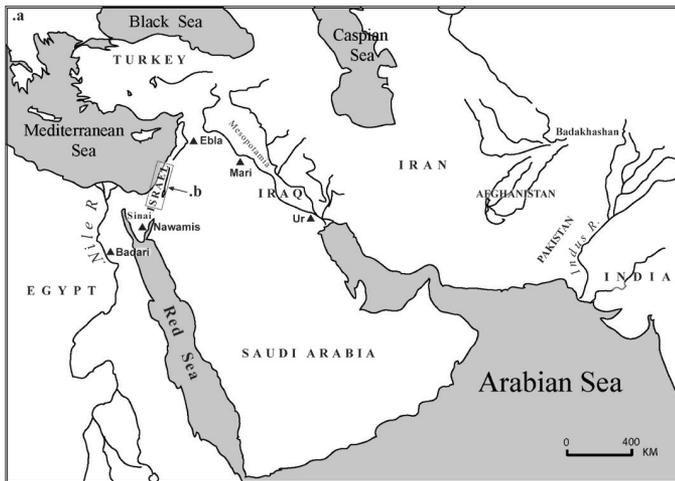


Figure 2a. Map of the Middle East showing the origins of raw materials and technologies with sites mentioned in the text marked as triangles. Map by N. Porat.

Beads (fig. 3)

Table 1 summarizes the information on the beads, and provides identification and measurements of these artifacts based on inspection under a stereomicroscope and analysis with a scanning electron microscope with energy dispersive x-ray spectroscopy (SEM-EDS). It is supplemented by additional information here.

Three short round beads were defined as shell beads in the original publication based on their structure; this identification is confirmed under the microscope. They were probably produced from a large gastropod, such as the *Lambis* genus. Another bead was made of calcite and was brighter and smoother than the shell beads. Its different dimensions also suggest that it was manufactured separately from the shell beads.

Seven carnelian beads were easily recognizable by their distinct reddish hues, translucency, and hardness. The surface of the beads was shaped by pecking, with associated scars visible under the microscope followed by filing. Two of the beads have a straight profile, while the other two have a truncated convex profile. One of the smaller dark red beads has a pentagonal transverse section. One carnelian bead is significantly different and much larger than the previous six carnelian beads. The bead's raw material is opaque and varies in color from orange to cream; one of the ends of the bead is crumbling, suggesting that it may have been heat-treated or accidentally exposed to fire.

One bead in the assemblage stands out, its dark blue color with small white veins being very distinctive of lapis lazuli. Its material was confirmed under SEM as containing lazurite and häüynite, minerals that are the components of lapis lazuli. The bead's dimensions and shape are similar to those of the white shell beads.

Three green beads were identified as made of glazed enstatite, a material also known from a number of other Chalcolithic sites (see glossary, p. 268). The technological process involved in the production of this type of bead is as yet unconfirmed, but these beads offer some clues for a better understanding of that process. In one of the specimens (61-1244) we noted an incision in the center along its circumference, suggesting that it was intended

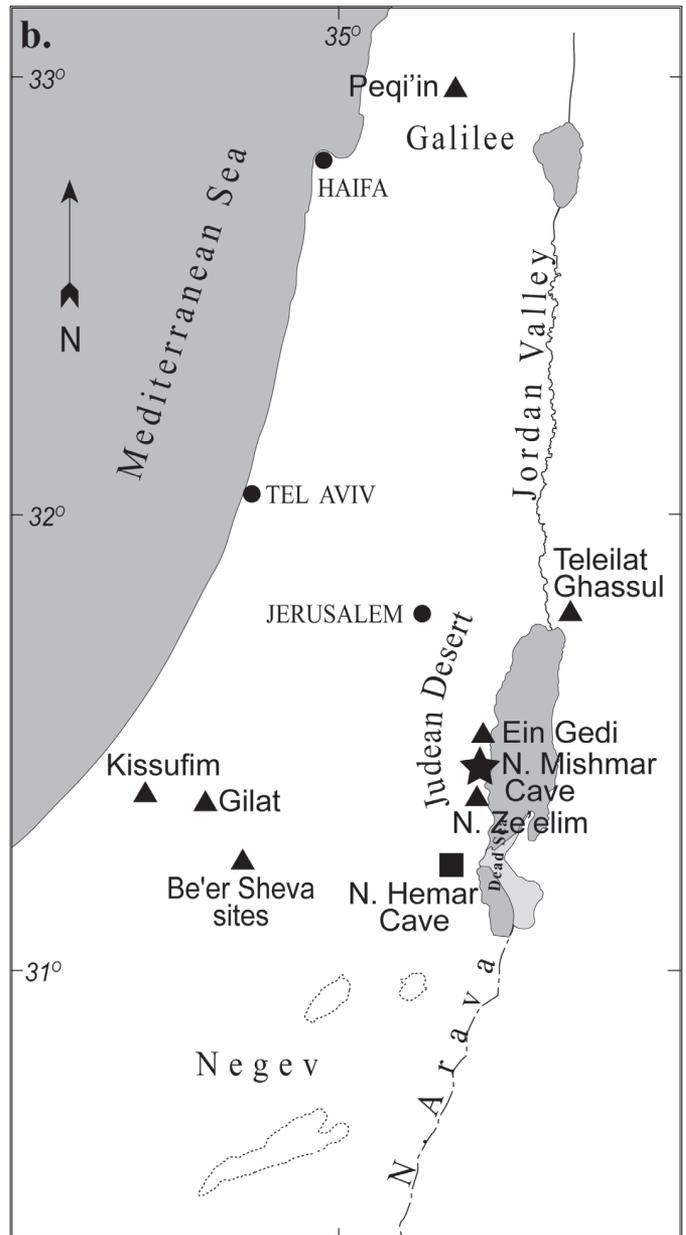


Figure 2b. Map of sites mentioned in the text. Star: the Cave of the Treasure at Nahal Mishmar; triangles: Chalcolithic sites; square: Neolithic site; dots: modern cities. Map by N. Porat.

to divide this bead into two. Alternatively, this specimen may be composed of two beads, which adhered to each other during the production process. In another specimen (one of the two specimens designated 61-1245), a crack along the surface from one end to the other constitutes another unusual phenomenon deserving further investigation, and possibly indicates the rolling of steatite paste prior to heating. A depression observed in one end of this specimen may suggest that this bead comes from the end of a row of beads sliced from the same roll (Bar-Yosef Mayer and Porat 2010). In the third specimen (the second specimen designated 61-1245) there are reddish colored "cracks" on the surface. This could be a result of the drying process during the firing of the bead, and correlates with the presence of iron in this specimen as observed under the SEM.

Pendants and Palette (fig. 4)

Three mother-of-pearl pendants were found in the Cave of the Treasure. They resemble the trapezoidal double-holed pendants typical to the Ghassulian Chalcolithic, but are rectangular rather than trapezoidal. Their dimensions and other observations are described below. All pendants were made of either the Red Sea *Pinctada margaritifera* or the Nilotic *Chambardia rubens*, but the absence of indicative morphological characteristics hindered a precise taxonomic identification. All measurements below are given in mm.

- **Item 61-1129:** Length – 22.62; width – 20.25; Thickness – 2.16; diameter of left hole (h1) – 2.77; diameter of right hole (h2) – 3.20. The holes were drilled near the upper edge of the pendant. It seems that one of the holes was damaged during its manufacture, and another was immediately drilled, as suggested by the filing observed around the damaged hole. However, it is also possible that the pendant was very heavily used, and is therefore worn very smooth throughout. Signs of stringing (use wear) are visible on the exterior edges of the two holes, but the absence of use wear on the other face of the pendant suggests that the pendant was sewn onto a cloth. Beads could have been strung on, for example, flax strings (attested in the earlier, Neolithic cave of Nahal Hemar, Schick 1988).
- **Item 61-1130:** Length – 24.05; width – 19.85–21.29; thickness – 1.44; h1 – 3.20; h2 – 3.21. On this pendant are remains of the outer calcitic layer of the shell, pointing to either *P. margaritifera* or *C. rubens*. The edges of the pendant are slightly damaged, and this seems to have occurred in antiquity. The pendant is highly polished, and grooves, which are the result of stringing, are observed at the edges of the holes on the nacreous side of the shell, near the edge of the pendant, similar to the previous item.
- **Item 61-1134:** Length – 21.95; width – 15.32 (top) to 17.11 (bottom); thickness – 1.59; h1 – 2.87; h2 – 2.67. The pendant is very slightly trapezoidal and highly polished. Concentric striations are visible in the holes, possibly indicating that a mechanical drill (bow drill or pump drill) was used.

The trapezoidal palette is made of limestone. Its maximum length is 39.94 mm, its width varies from 20.12 mm (top) to 33.5 mm (bottom), and it is 6.28 mm thick. Filing and polishing were carried out on a crude surface, possibly sandstone, and marks of this activity are clearly visible on the item.

THE SIGNIFICANCE OF PERSONAL ORNAMENTS IN THE CHALCOLITHIC LEVANT

The personal ornaments at the Nahal Mishmar Cave of the Treasure include beads, pendants, and a palette. The stone beads were made of various raw materials: mollusk shell, calcite, carnelian, glazed enstatite, and lapis lazuli. Bar-Adon (1980) had referred to the carnelian beads as agate and mistook the glazed enstatite

beads for faience. The lapis bead, only briefly mentioned in the original excavation report, is a rare find in sites in Israel, and is probably the earliest lapis lazuli bead known from the southern Levant. Two lapis lazuli beads were excavated at the fourth millennium B.C.E. *nawamis* field (cluster of burial structures) of El Abar 27 in southern Sinai (Bar-Yosef Mayer 1999: 96). However, since this raw material is present in Predynastic sites in Egypt (e.g. Petrie and Quibell 1896: 10, 44), its presence should not come as a surprise, despite its remote origin, most likely in the Badakhshan region of Afghanistan or elsewhere in Central Asia (Casanova 1999).

Another raw material with possible remote origins is the glazed enstatite, a common material in Chalcolithic sites in the Levant and beyond. The three specimens from Nahal Mishmar, along with another group from Nahal Ze'elim (a "purse" made of beads, superficially published by Aharoni 1961: 15, pl. 7: A-D), are the

only ones in Israel in which the original green-turquoise color was well-preserved. Two similar beads were found at the Ein Gedi Shrine (Ussishkin 1980: 25). Green-glazed enstatite beads are known from Badarian sites in Egypt (ca. 4400–4000 B.C.E.), as well as from sites in Mesopotamia, and as far as the Indus valley (Bar-Yosef Mayer and Porat 2010). Newly discovered specimens from a Chalcolithic site in Anatolia seem to have a slightly different composition from our specimens (Pickard and Schoop 2013).

A few carnelian beads, ranging between 3 and 10 mm in outer diameter (average 6 mm), are known from Neolithic sites, as well



Figure 3. Beads of Nahal Mishmar. Photograph by T. Rogovski, courtesy of the Israel Antiquities Authority.

as from other Chalcolithic sites such as the burial cave of Peqi'in (Bar-Yosef Mayer and Porat 2013). These examples are usually larger than the small beads encountered in the Cave of the Treasure, which seem to be among the earliest beads of such a small size made of this hard material (7 on the Mohs scale), testifying to the remarkable technological proficiency of the artisans producing them (Groman-Yaroslavsky and Bar-Yosef Mayer, in preparation).

The shell beads were produced from a large shell, possibly *Lambis truncata*, a large Red Sea gastropod and well-known from other Chalcolithic sites. Most notably, bangles from this shell were encountered in sites such as Gilat and Shiqmim, as well as in the *nawamis* tombs (fig. 2). The similar shape and dimensions of the lapis lazuli and shell beads may indicate that they were used together in a single piece of beadwork, as is attested in later periods where the combination of these two materials and colors was common, for example at Ur, Ebla, and Mari. The pairing of blue lapis lazuli with red carnelian was also common in Mesopotamia (Pittman 1998).

Other shell artifacts from Nahal Mishmar include double-holed pendants. Similar items are scattered in several Chalcolithic sites, the largest concentration being from the Kissufim burial ground (Bar-Yosef Mayer 2002). Another group of six similar pendants, made of shell and bone, was found by Aharoni in Cave 49 in Nahal Shafan, Judean Desert (Aharoni 1961: 14, pl. 8: C). Two of the six pendants he mentions have diagonal incisions similar to those from Kissufim, but such incisions were not observed in the Nahal Mishmar specimens. The latter were also significantly smaller than those from Kissufim.

The trapezoidal limestone pendant resembles dozens of such palettes from other Chalcolithic sites, and it may have had a ritual function (e.g., Rowan and Golden 2009).

Although all items described and discussed above are dated to the Chalcolithic period, the possibility that a few beads date to one of the other two periods present in the cave, Early Bronze IB and Roman, cannot be ruled out. However, as most artifacts and raw materials have parallels in other Ghassulian Chalcolithic sites or in contemporaneous Near Eastern cultures, we assume that they are correctly assigned to this period.

The personal ornaments from the Cave of the Treasure are the products of several technological traditions and *chaînes opératoires*. It appears that both the bead-making technology (e.g.

glazed enstatite) and the raw materials, with the possible exception of limestone and calcite, originate in regions distant not only from the Judean Desert, but from the Ghassulian cultural sphere in general. Thus, the personal ornaments from the cave are powerful manifestations of the long-range cultural contacts of the Ghassulian. The raw materials and the finished products probably circulated within Ghassulian communities and between the Ghassulian and neighboring cultural entities by means of exchange (e.g. Rowan and Golden 2009).

In accordance with the refuge model, it is hypothesized that the personal ornaments were obtained by members of the community that fled to the Cave of the Treasure, as well as to other Judean Desert cliff caves, prior to the refuge episode. When the latter occurred, the beads and pendants reached the cave in two probable forms: either as parts of personal adornment, or as beadwork decoration on textiles or basketry as evidenced in

Nahal Ze'elim. The large corpus of textiles and basketry uncovered in the Cave of the Treasure, preserved due to the excellent preservation conditions in the cool and dry Judean Desert caves, does not contain attached beads or pendants; however, these could have been detached during post-depositional processes over the last six millennia. The beads and pendants were finally deposited in the cave during or towards the end of the temporary refuge episode, before the occupants left the cave for an unknown destination.

The beads and pendants functioned as personal ornaments and as such, they likely also had symbolic significance, possibly related to their colors. The lack of clear stratigraphic and material contexts does not enable any further assessment of this subject. It

is hoped that rigorous collection of personal ornaments in other Chalcolithic sites, as well as future scientific analyses of these artifact categories, will enable researchers to assess more clearly the issues of social and cultural identity, symbolic meanings, and technological advances.

Acknowledgments

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Figure 4. Pendants and palette of Nahal Mishmar. Photograph by T. Rogovski, courtesy of the Israel Antiquities Authority.

Table 1. Personal Ornaments of Nahal Mishmar.*

Catalogue Number	Bead Material	Color	Beck Type	Outer Diameter	Inner Diameter	Height	Perforation	Chemical Analysis (SEM)
61-1129	mother of pearl	nacre, yellowish	pendant two holes	–	–	–	from inside	–
61-1130	mother of pearl, <i>Chambardia?</i>	nacre, yellowish	pendant two holes	–	–	–	from inside	–
61-1131	limestone	beige	trapezoid palette	–	–	–	none	–
61-1134	mother of pearl	nacre, yellowish	pendant two holes	–	–	–	from inside	–
61-1241	shell	off white	I.B.2.b	7.13	2.57	5.54	straight	–
61-1242	shell	cream	I.B.2.b	7.32	2.41	4.06	straight	–
61-1243	calcite	white	I.B.2.b	8.34	3.31	5.84	straight	–
61-1244	glazed enstatite	green	I.B.2.b	2.98	0.8	2.7	straight	Si, Mg, Ca (Al, Cu)
61-1245	glazed enstatite	green	I.B.2.b	3.57	1.25	2.81	straight	Si, Mg, Ca (K, Fe, Cu)
61-1245	glazed enstatite	green	I.C.2.b	3.41	1.32	3.19	straight	Si, Mg, Ca (K, Fe, Cu)
61-1246	carnelian	orange translucent	I.B.2.b	5.21	1.66	2.87	from two ends	–
61-1246	carnelian	orange translucent	I.B.2.b	4.63	0.86	2.37	from two ends	–
61-1246	carnelian	orange translucent	I.B.1.f	4.18	1.27	2.02	from two ends	–
61-1246	carnelian	orange translucent	I.B.1.f	3.94	1.39	2.75	from two ends	–
61-1246	carnelian	dark red translucent	XII.B.2.b	3.73	1.35	2.22	from two ends	–
61-1246	carnelian	dark red translucent	I.B.1.f	3.29	0.85	2.08	from two ends	–
61-1246	shell	off white	I.B.2.b	6.07	2.64	3.42	straight	–
61-1247	lazurite and haüynite	blue, white spots	I.B.2.b	7.72	3.9	4.74	straight	Si, Ca, Al, Mg, Na, K, S (P, Cl, Fe)
61-1249	carnelian	orange to cream opaque	I.B.2.f	11.46	2.63	6.92	from two ends	–

*Catalogue numbers correspond to numbers used by the Israel Antiquities Authority. All measurements are in mm.

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