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in the Near East

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Nicola Laneri



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Front cover: *Arms, hands and elements of clothing reveal the anthropomorphic character of Göbekli Tepe's pillars (Pillar 31 in the centre of Enclosure D) (photo: N. Becker, © DAI).*

Back cover: *Detail of Ur-Nammu's stele (Börker Klähn 1982, pl. 39)*

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Casting the sacred: Chalcolithic metallurgy and ritual in the southern Levant

Milena Gošić and Isaac Gilead

Introduction

The Ghassulian culture emerged in the mid-5th millennium BC and lasted roughly till the end of the millennium (Gilead 2011, 14). Neuville (1930) and Albright (1932) named the culture after the site of Teleilat Ghassul, located north-east of the Dead Sea, not far from its northernmost tip. Ghassulian sites are distributed mainly in the Northern Negev, the Dead Sea basin, the southern and the central Coastal Plain, the Shephella and the Jordan Valley (Gilead 2011, 13; Rowan and Golden 2009) (Fig. 14.1). It is the best documented Chalcolithic culture in the southern Levant and also the only metalworking cultural entity, considering that there is no evidence for metallurgy in either the Besorian, a predecessor of the Ghassulian (Gilead 2007), in the Timnian or the Golanian cultures.

The research of the Ghassulian copper metallurgy can be informally divided into a number of aspects. Smelting and production of copper artifacts have been studied from the technological and socio-economic aspects (Levy and Shalev 1989), while finished artefacts have been the subject of symbolic and stylistic analyses (e.g. Bar-Adon 1980; Beck 1989; Gilead *et al.* 1992; Golden *et al.* 2001; Golden 2009b; 2009a; Goren 2008; Ilani and Rosenfeld 1994; Moorey 1988; Shalev and Northover 1987; 1993; Shugar 2000; Shugar and Gohm 2011). The ritual aspects of the metalworking, ritualised procedures of smelting and casting for example, have been largely overlooked. Our intention is to examine the probable protocol of Ghassulian copper production and the nature of the finished artifacts and their symbols from the perspectives of ritual. We argue that Ghassulian copper artefacts were produced for ritual purposes and not for practical use. We wish to understand how the introduction of metallurgy modified the ritual life of the Ghassulian community and how it was related to the transition between early to late Ghassulian. We conclude by discussing the Nahal Mishmar hoard from the perspective of ritualised metallurgy and secondary burials.

The phases of the Ghassulian culture

The Ghassulian sites and artefactual assemblages have been extensively studied since the late 1920s and are relatively well known (e.g. Bourke *et al.* 2001; Elliot 1977; Gilead 1988; 1993; 1994; 2011; Levy 1986b; Rowan and Golden 2009). The Ghassulian as a cultural entity is characterised by underground and surface architecture, rectangular rooms, pottery vessels such as churns, cornets, hole-mouth jars and V-shaped bowls and flint tools such as bifacials, sickle blades and fan-scrapers. Worth noting are also the bone tools, the ground stone industry, ivory carving, spinning and weaving. Most significant, however, and the subject matter of the current paper is the Ghassulian copper metallurgy and its products.

The Ghassulian may be divided in two phases. The earlier phase consists of the bulk of the Ghassulian strata at Teleilat Ghassul, and of sites in the north-western Negev such as Gilat, a few of the Nahal Besor sites and Grar. This phase is radiometrically dated to about 4500–4300 cal. BC. It is followed by a later Ghassulian phase, c. 4200–4000 cal. BC, which is best represented by sites along the Nahal Beer Sheva, such as Abu Matar, Bir es-Safadi, Horvat Beter, Shiqmim (Gilead 2011, 20). There are clear differences between the two phases (Gilead 2011, 19), but, for the time being we will focus on two. Metallurgy is practically unknown in early Ghassulian sites. It has even been suggested to label this phase “*Pre-metallic*” (Golden 1998, 58; 2009b, 47). Metallurgy and copper artifacts characterise the late Ghassulian as is clearly indicated by the abundant remains related to metallurgy that were unearthed in the Nahal Beer Sheva sites. The second difference relates to burial customs. We suggest that the custom of secondary burials in formal off-site cemeteries – in caves and above-ground structures – characterise the late Ghassulian.

The radiometric dating of the secondary burial sites is still limited and problematic. Currently, radiocarbon dates are available only for Shoham (North) (Carmi and Segal 2005), Nahal Qanah (Carmi 1996) and Peqi'in (Segal *et al.*

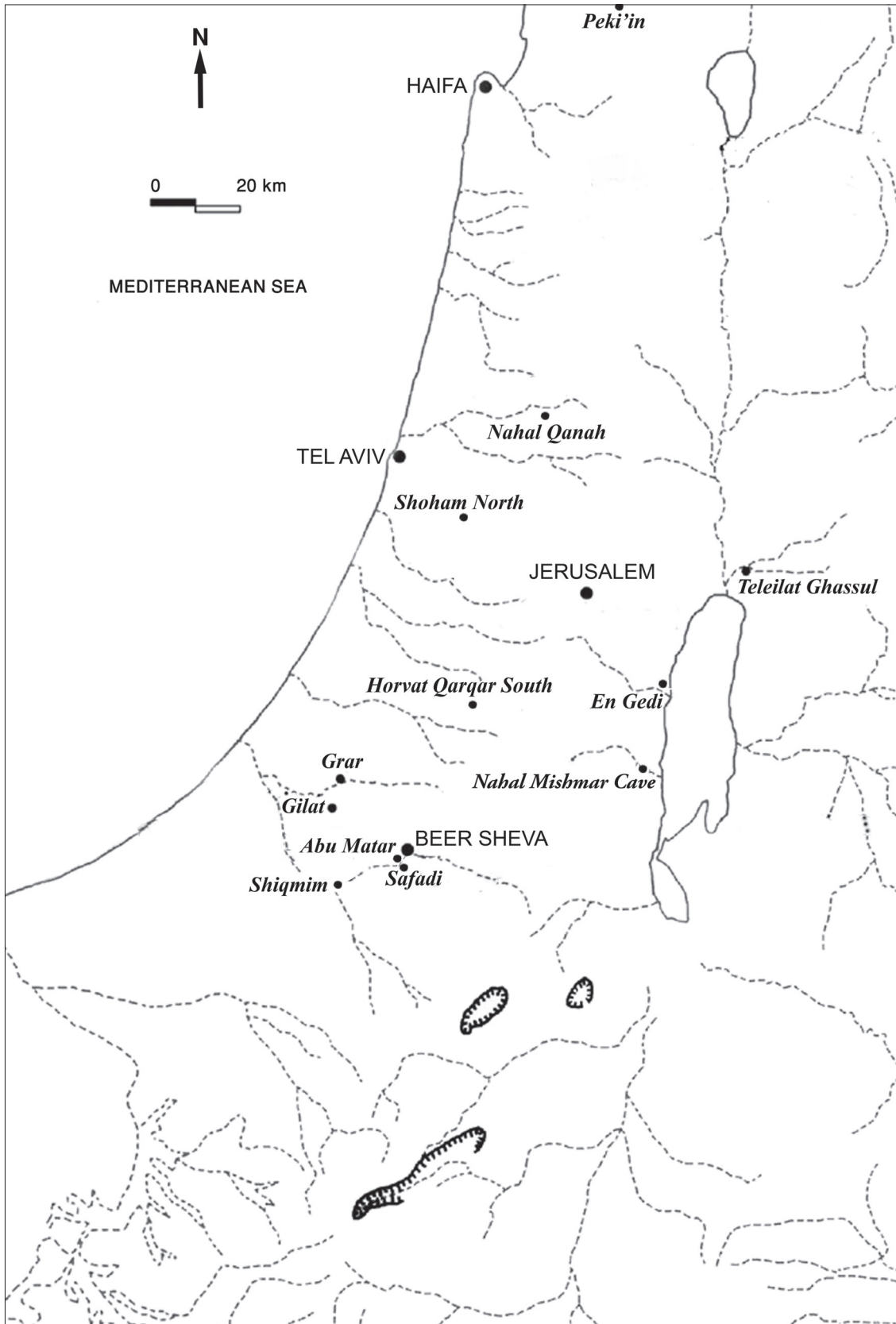


Fig. 14.1: Map of the Southern Levant with major archaeological sites mentioned in the text.

1998). Their 2-sigma distributions are presented in Figure 14.2. The two Shoham (North) dates fall neatly into the late Ghassulian and their average range (72.8%) is 4042–3930 cal. BC (calibrations here and below are based on OxCal 4.1: Bronk Ramsey 2009). Almost of an identical range are the yet unpublished dates from the Horvat Qarqar South cemetery in the southern Shephella, recently excavated by Peter Fabian. The four dates from this site have a 2-sigma range (70.3%) of 4076–3975 cal. BC (Fabian 2012; pers. comm.).

Of the eight Nahal Qanah dates, three were associated with Neolithic occurrences and five come from the Passage (Carmi

1996, 206). The latter were associated with the gold and other Ghassulian artefacts (RT-861A, B, C, E and RT-1545), although one of them, RT-861B, is centuries earlier and we exclude it from the discussion. The ranges of the four Passage dates (Fig. 14.2) indicate that they represent more than one occupational event, but they indicate that the main Chalcolithic occupation of the cave is of late Ghassulian times.

From the Peqi'in cemetery in the higher Galilee, 22 radiocarbon samples are available, but only three of them are considered here (Fig. 14.2) since they are the only ones from the burial phase (Segal *et al.* 1998, table 2). The three dates

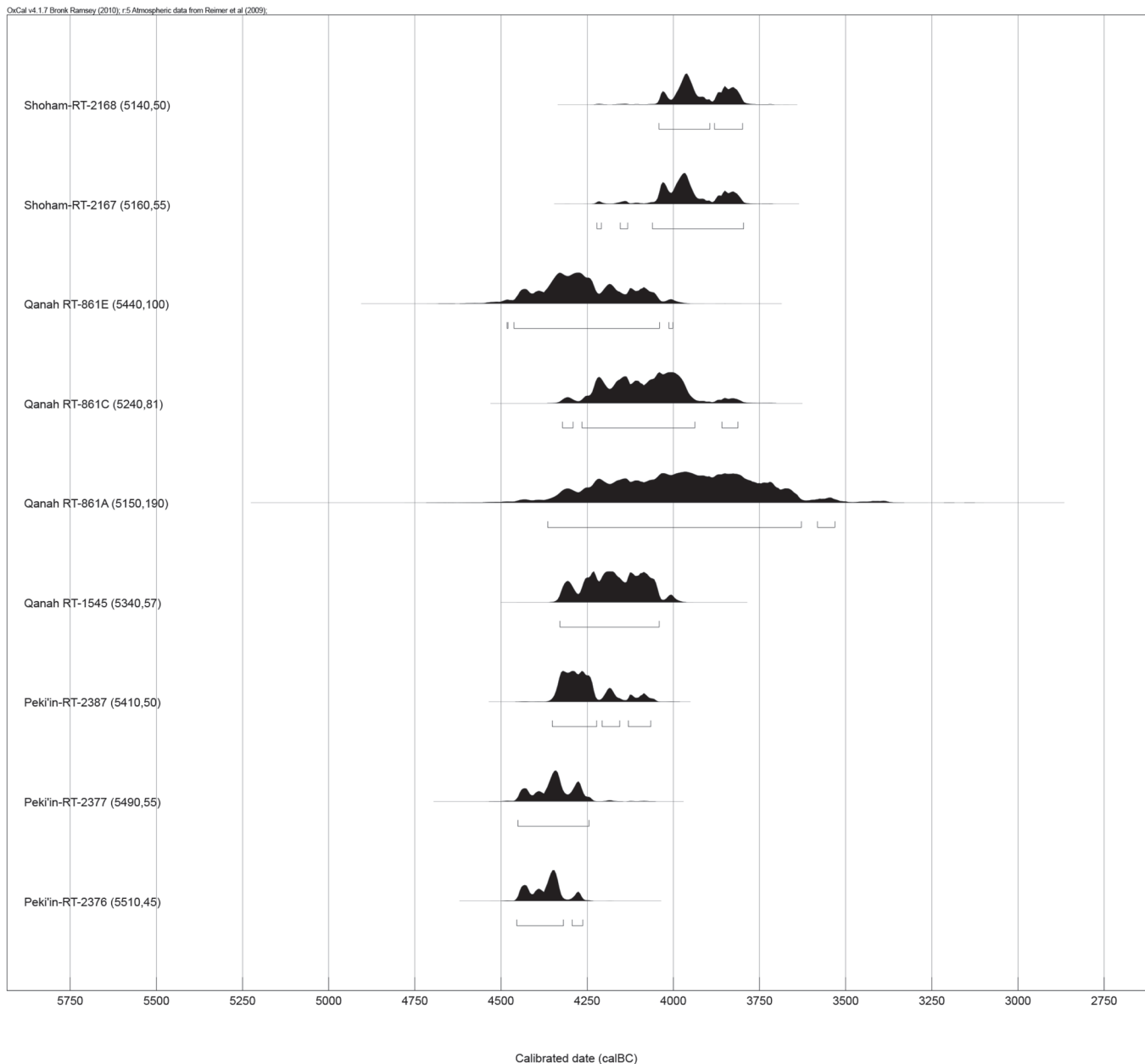


Fig. 14.2: Selected radiocarbon dates from secondary burial caves.

have an average 2-sigma range (62%) of 4363–4312 cal. BC which signifies an early Ghassulian use of the cave and seems not to support our above claim. However, the fact that there are no late Ghassulian dates from the cave has already been noticed by the excavators who suggest that additional research will be needed to understand the chronological implications of the Peqi'in (Segal *et al.* 1998, 711). And, indeed, additional dates are now available and they indicate that the cave was used as burial a ground during the late Ghassulian too (Dina Shalem, personal communication). Since the dates of all the other burial caves clearly indicate a late Ghassulian use, and since additional research is needed to better understand the chronology of Peki'in, it seems that our contention that the secondary burial is a late Ghassulian custom can be maintained.

Ghassulian metallurgy

Metallurgical remains such as production debris and finished artefacts, have been discovered at many late Ghassulian sites, including settlements in the Northern Negev (Eldar and Baumgarten 1985; Gilead *et al.* 1992; Namdar *et al.* 2004; Perrot 1955; Shalev and Northover 1987), burial caves (Gal *et al.* 1997, 145; Gopher and Tsuk 1996, 114–115; Gophna and Lifshitz 1980, 8; Perrot and Ladiray 1980, 41, fig. 142.1; Segal 2002) and at Nahal Mishmar (Bar-Adon 1980, 24–133). Nahal Qanah is unique, since it is the only site where Ghassulian gold has been found, along with copper artifacts

Metalworking practices

Traces of metalworking have been found in number of sites, including Abu Matar (Gilead *et al.* 1992; Perrot 1955), Bir es-Safadi (Eldar and Baumgarten 1985), Shiqmim (Shalev and Northover 1987) and Nevatim (Gilead and Fabian 2001), and the finds include crucible fragments, furnace remains, ores, slag and finished artifacts.

Two distinct casting technologies were used: open mould and lost wax casting. The process of copper smelting and open mould casting is best documented at Abu Matar (Golden 2009b; Shugar 2000) and Shiqmim (Golden *et al.* 2001; Shalev and Northover 1987), where several kinds of ore, mostly from Feinan, have been used (Hauptmann 1989; Shugar 1998, 114). Evidence of both smelting and casting is scattered in numerous loci across these sites. At Abu Matar, archaeometallurgical debris has been documented in numerous units (Gilead *et al.* 1992; Perrot 1955, 25, 29, 33–34, 79), with particular units described as a workshops (Golden 2009b, 126; Shugar 2000, 244–252). Metallurgy-related artefacts and materials, including ore, slag, crucible fragments and finished artefacts, were also spread out over the entire excavated area of Shiqmim (Shalev and Northover 1987, 366).

Suggested loci of lost wax casting are the Beer Sheva sites (Moorey 1988, 186; Shugar 2000, 216). This is supported by the arsenic detected in the furnace and the crucible slag in Abu Matar (Shugar 2000, 204), the possible ingot from Bir es-Safadi (Golden 2009b, 144) and the finished artefacts (e.g. Eldar and Baumgarten 1985; Namdar *et al.* 2004; Shalev and Northover 1987; Shalev *et al.* 1992). Goren's (2008) recent suggestion that a copper industry operated in the En Gedi shrine or nearby cannot be supported since no metallurgical remains are known from there.

Provenance of the complex metal ores used for lost wax casting (Shalev and Northover 1993; Tadmor *et al.* 1995) is unknown, although several locations have been suggested, including Anatolia, Caucasus, Iranian Plateau, Sinai and Zagros mountains (Ilani and Rosenfeld 1994; Key 1980, 242; Rothenberg 1991, 7; Tadmor *et al.* 1995, 141–142). It is possible that metal was smelted using ores from different origins (Shalev and Northover 1993). No ingots have been found so far and the small amorphous lump of arsenic rich metal found at Nahal Qanah resembles a byproduct of production rather than ingot (Golden 1998, 78; 2009b, 56). A possible exception is a rectangular object made of copper rich in arsenic, antimony and lead, discovered at Bir es-Safadi (Golden 1998, 259; 2009b, 144).

Ghassulian copper artefacts

Ever since the publication of the Nahal Mishmar hoard, the copper artefacts of the Ghassulian culture have been divided into two groups: utilitarian and prestigious (Potaszkin and Bar-Avi 1980, 235). According to this division, utilitarian artefacts were cast in open moulds from pure copper, and the prestigious ones were cast in the lost wax technique from alloyed metals. The division is not entirely consistent and lost wax castings have been made from pure copper in few instances and *vice versa* (Key 1980, 239; Moorey 1988, 185). Dividing copper artefacts into prestigious/ritual on the one hand and utilitarian on the other hand, seems even less valid. First, flint tools such as axes and adzes were widely used throughout the Ghassulian (Gonen 1992, 56–58). Second, the so-called utilitarian copper tools, lack use-wear and are either too thin or too long to be practically used (Tadmor *et al.* 1995, 97). In addition, copper artefacts of both groups are found in the same archaeological contexts: production sites, burial caves (Gal *et al.* 1997, 145; Gopher and Tsuk 1996; Gophna and Lifshitz 1980, 8; Perrot and Ladiray 1980, 41, fig. 142.1; Segal 2002) and in Nahal Mishmar (Bar-Adon 1980, 24–133). In fact, the Nahal Mishmar hoard, with its 423 copper objects, constitutes most of the currently known Ghassulian copper artefacts, which is why most studies (e.g. Bar-Adon 1980; Beck 1989; Elliot 1977; Epstein 1978; Gates 1992; Tadmor 1989; Tadmor *et al.* 1995), both of technology and style, have been conducted on the objects from the hoard.

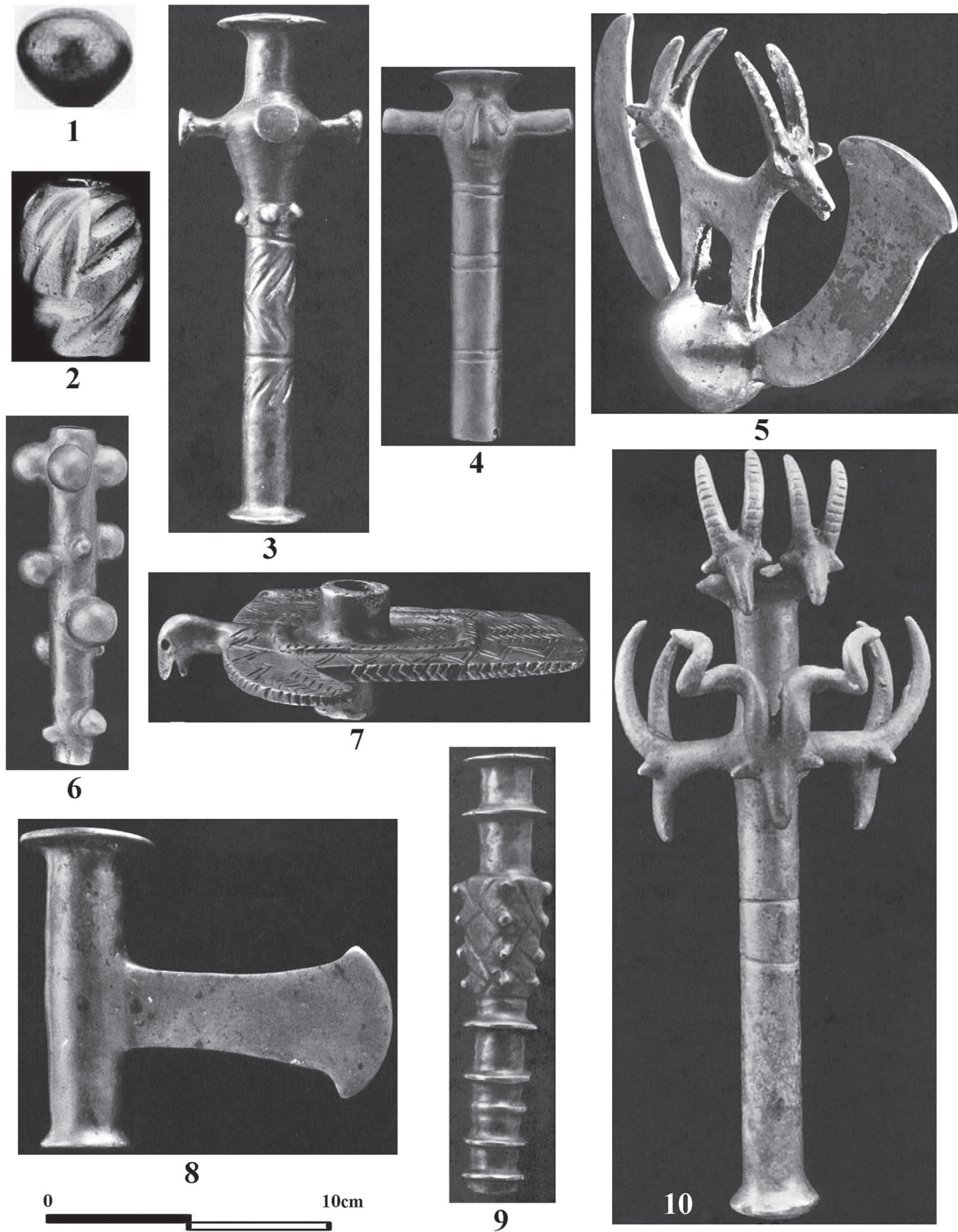


Fig. 14.3: Copper artefacts from the Nahal Mishmar hoard. 1. Macehead (Bar-Adon 1980, 120, no. 184); 2. Macehead (*ibid.*, 118, no. 180); 3. Standard (*ibid.*, 85, no. 110); 4. Standard (*ibid.*, 49, no. 21); 5. Standard (*ibid.*, 101, no. 153); 6. Standard (*ibid.*, 48, no. 20); 7. Standard (*ibid.*, 103, no. 154); 8. Standard (*ibid.*, 98, no. 148); 9. Standard (*ibid.*, 93, no. 129); 10. Standard (*ibid.*, 45, no. 17). Courtesy of the Israel Exploration Society.

Maceheads

The most frequent Ghassulian copper object is the macehead, with over 240 discovered in the Nahal Mishmar hoard (Bar-Adon 1980, 116–131) and several from other sites (Gopher and Tsuk 1996; Shalev *et al.* 1992). Maceheads have a hole for a shaft and can be spherical, piriform, discoid, triangular and flattened. They are mostly undecorated (Fig. 14.3, 1) and few feature grooves (Fig. 14.3, 2) and vertical lines (Bar-Adon 1980, 118). The interpretation of these decorations might be overly speculative. It is probable they were attached to a shaft and displayed, either in a specific location or in a procession. A macehead was an apparent symbol of political or military power, especially on the basis of comparative Egyptian iconography (Baines 1994, 111).

Standards

Standards (Fig. 14.3, 3–10), the second most frequent artefact type, were also fixed on a shaft, but are composite and more diverse in terms of symbols. Most known Ghassulian standards come from Nahal Mishmar (Bar-Adon 1980, 40–102), but they are known from other sites as well, such as Peqi'in, Nahal Qanah, Palmahim and Giva't HaOranim (Gal *et al.* 1997, 151; Gopher and Tsuk 1991, 19; Gophna and Lifshitz 1980, 8; Namdar *et al.* 2004). Since remains of wood were found inside few of them, (Bar-Adon 1980, 40) suggests that standards were carried on staffs, probably in processions.

Sceptres

Sceptres (Fig. 14.4, 1) are similar in shape and composition to standards, but tend to be elongated, narrower and without a shaft (Bar-Adon 1980, 90–93).

Cylinders – “Crowns”

Copper cylinders (Fig. 14.4, 6) better known as “crowns”, have been discovered only in Nahal Mishmar (Bar-Adon 1980, 24–39). The purpose the cylinders were used for is unknown, though it has been suggested that they were used to assemble a portable drum-like altar (Amiran 1985). Ziffer (2007, 54) suggests that they were symbols of political power, used in similar manner as standards and maceheads.

Horns

Three horns were found in the Nahal Mishmar cave (Fig. 14.4, 2). Their shape resembles the horns of plenty from later period (Bar-Adon 1980, 104–105),

Jars

Nahal Mishmar yielded a number of jars, including one with an elongated neck, three basket-like jars and one wide-mouthed jar (Bar-Adon 1980, 106–111).

Open cast mouldings

Objects cast in open mould are adzes, awls, axes, chisels (Fig. 14.4, 4–5) and a hammer (e.g. Bar-Adon 1980; Eldar and Baumgarten 1985; Gal *et al.* 1997; Namdar *et al.* 2004; Shalev and Northover 1987). As has been mentioned, it is likely that these were never used, based on their design, lack of use-wear and abundance of the flint tools in the artefact assemblages.

Skeuomorphic axe

One axe from the Nahal Mishmar hoard stands out in terms of design. The axe (Fig. 14.4, 3) features one sharp and one dull edge and a hole for a shaft in the thickest part of the body (Bar-Adon 1980, 112). Around the hole there is an image of the rope that ties the shaft to the axe. It is a typical example of a skeuomorph: the rope image has no function and only mimics the way a stone axe was tied to a handle. We consider this axe to be of crucial importance for the understanding of the Ghassulian copper metallurgy and we will return to it shortly.

Decoration of the Ghassulian copper artefacts

The symbolic motifs that appear on the Ghassulian copper artefact can be divided into the following categories: (1) anthropomorphic; (2) zoomorphic; (3) floral; (4) tools and weapons as motifs in composite artifacts; (5) abstract; (6) architectural. While the first and the second group are relatively easily identifiable, the definitions of the other groups are somewhat ambiguous.

Anthropomorphic motifs

The first group is relatively easily recognisable (Figs 14.3, 4, Fig. 14.4, 2). The most common anthropomorphic motif is a protruding nose, often shown with two knobs representing eyes. They appear on standards, crowns and horns.

Zoomorphic motifs

The common zoomorphic motifs are ibexes and ibex horns (Figs 14.3, 5 and 10, Fig. 14.4, 2 and 6) and birds (Fig. 14.3, 7, Fig. 14.4, 2 and 6). Some of the animals with shorter horns have been interpreted as goats (Epstein 1978, 29), which would suggest that both wild and domesticated animals are represented. The animal with twisted horns from the Nahal Mishmar standard no. 17 (Fig. 14.3, 10) is possibly Addax or Kudu antelope (Haas in Bar-Adon 1980, 42).

Floral motifs, tools and weapons as motifs and abstract motifs

We choose to present these groups together, as there is yet no consensus for the meaning of all motifs found on the artefacts. Several motifs have been described by Merhav (1993, 41) as floral, who suggests that the bubble-shaped projections on

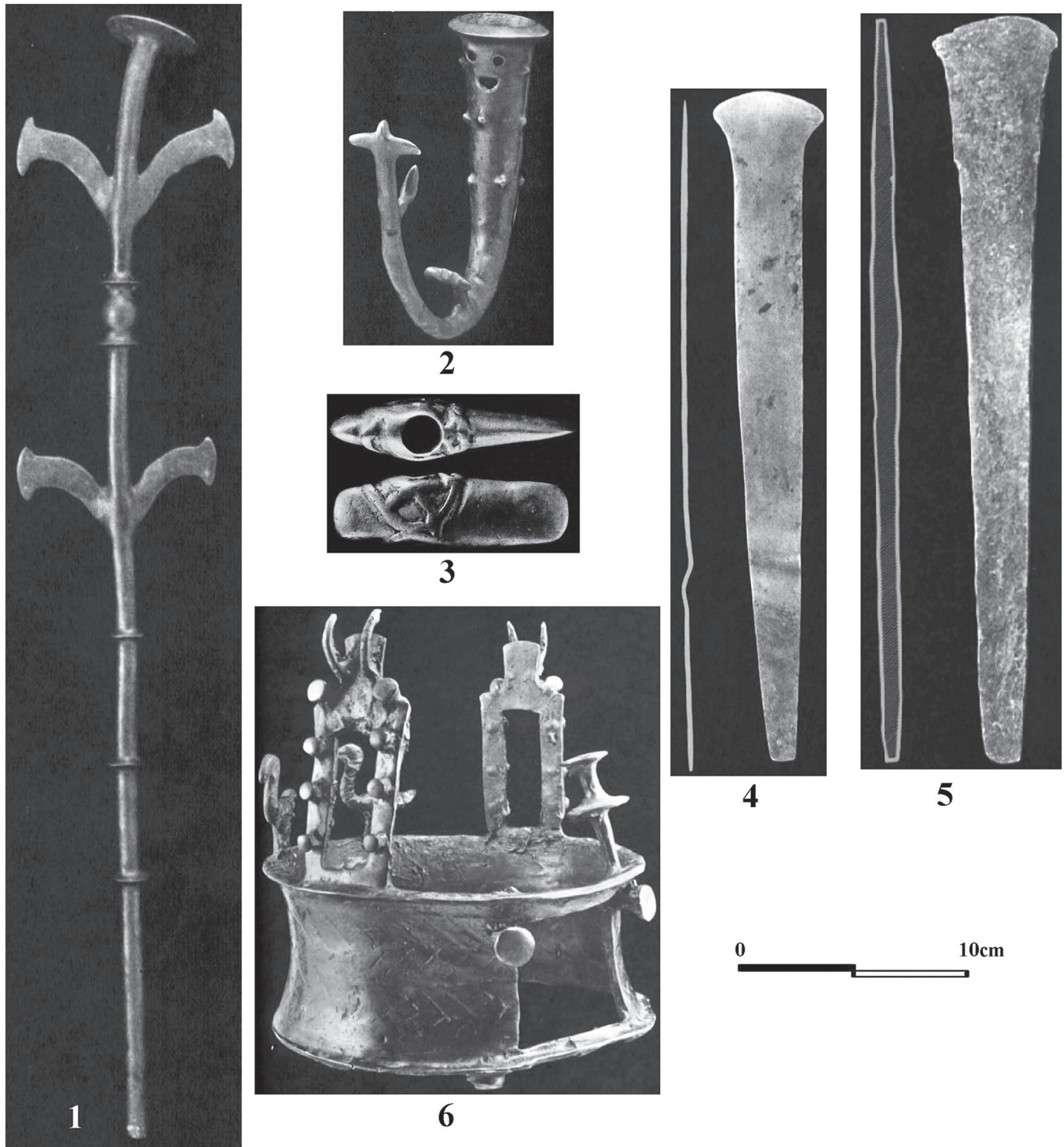


Fig. 14.4. Copper artefacts from the Nahal Mishmar hoard. 1. Sceptre (Bar-Adon 1980, 91, no. 126); 2. Horn (*ibid.*, 104, no. 155); 3. Axe (*ibid.*, 112, no. 163); 4. Chisel (*ibid.*, 113, no. 168); 5. Chisel (*ibid.*, 113, no. 167); 6. Cylinder (*ibid.*, 25, no. 7). Courtesy of the Israel Exploration Society.

standard no. 20 (Fig. 14.3, 6) are grafts on a tree. Merhav (1993, 35) also suggests that the knobs found on several standards (Fig. 14.3, 9) and scepters represent buds. The problem with interpreting knobs as buds, other than the abstractness of the form, is that they are also found on a standard with three ibexes on top, instead of the expected flower, (Bar-Adon 1980, 47). Tools, as parts of the design of standards, constitute the last type of symbols, and include mostly chisels (Fig. 14.3, 5 and 8) and maceheads (Fig. 14.3, 3).

While it is very likely that some standards, such as no. 148 (Fig. 14.3, 8) (Bar-Adon 1980, 98) and no. 153 (Fig. 14.3, 5) (Bar-Adon 1980, 100), are decorated with chisels and a blade, we have shown that similar motifs (Fig. 14.4, 1) have been interpreted either as blades (Merhav 1993, 23) or floral motifs, and even as a branching tree (Epstein 1978, 29). In addition, the discoid image found on many standards and interpreted as a part of a floral motif (Merhav 1993, 35), may represent a discoid macehead.

Probably the most frequently repeated symbol on standards and scepters is a macehead (Fig. 14.3, 3–5), which is also found as an independent copper artefact. Although only several maceheads are decorated, it is frequently the decorated part of a standard and includes also knobs, spiraling curves, diagonal and horizontal ridges, horizontal lines and protrusions similar to the flaring endings of standards (Bar-Adon 1980, 52–87). Other abstract motifs include herring bone (Fig. 14.3, 3 and 7, Fig. 14.4, 6), vertical and diagonal grooves (Fig. 14.3, 2) and ridges. Buds and bulbs interpreted by Merhav as floral motifs could easily be considered abstract as well.

Architectural motifs

Although there are more claims for architectural motifs (Merhav 1993, 35), we discuss here only the “doorways” on the aforementioned cylinder (Fig. 14.4, 6). These have been interpreted as gates of either a temple (Bar-Adon 1980, 133; Epstein 1978, 26; Merhav 1993) or a palace (Ziffer 2007, 53). The fact that there are no palaces in the Ghassulian architecture, even though numerous sites have been excavated, makes the latter interpretation hard to accept.

The situation is somewhat more complex with temples. Architectural elements at Gilat (Alon and Levy 1989; Levy 2006, 835–844), Teleilat Ghassul (Bourke *et al.* 2001; Elliot 1977; Hennessy 1982; Seaton 2008), and En Gedi (Ussishkin 1980), have been interpreted as temples-shrines-sanctuaries. However, it has been shown that this interpretation is problematic for Gilat and some of the structures at Teleilat Ghassul (Gilead 2002). The En Gedi complex (Ussishkin 1980) and structures in Area E at Teleilat Ghassul (Seaton 2008) were likely used for ritual purposes, although “temple” is not the adequate term.

The representations of the door might also signify an entrance to a house. Alternatively, they could also be related to the door representations on ossuaries, which, as we will see soon, are quite common.

Similar motifs in ivory, ceramics and stone

All of the above mentioned motifs are found on Ghassulian artefacts made of other raw materials such as pottery, stone and ivory. These motifs are found on ossuaries, pottery vessels and the Teleilat Ghassul paintings and ivory figurines. Common symbols include what we described above as abstract, anthropomorphic, zoomorphic and architectural elements.

Ceramic ossuaries offer the greatest variety of analogies. They have been found in numerous burial caves, such as Azor (Perrot and Ladiray 1980), Nahal Qanah (Gopher and Tsuk 1996), Peqi'in (Gal *et al.* 1997), and Palmahim (Gophna and Lifshitz 1980). Considering their use and frequent representation of doors, ossuaries can be understood as houses for the deceased that, deposited in a burial cave, represent an ideal village (Elliot 1977, 23). However, they have been interpreted also as temples (Bar-Adon 1980, 132–133; Epstein 1978, 29) and as barns (Bar-Yosef and Ayalon 2001).

Common motifs on ossuaries include anthropomorphic (Epstein 1978, 29, pl. 6c–d; Gal *et al.* 1997, 149, fig. 3; Merhav 1993, 33, fig. 4.5) and zoomorphic motifs (Merhav 1993, 33, fig. 4.3; Milevski 2002, 138–140) as well as doorways (Epstein 1978, 30, pl. 6d; Gophna and Lifshitz 1980, 3, fig. 3; Merhav 1993, 33, fig. 4.3).

Protruding noses found both on ossuaries and on copper artefacts are a common motif of what Epstein (Epstein 1978, 22–23) labels the Golan idols made of basalt. Thus, although the Golanian is an independent cultural entity (Epstein 1998), it is related to the Ghassulian from the chronological (Gilead 2011) and symbolic aspects.

Motifs found in copper artefacts are also found on pottery vessels other than ossuaries. Representations of ibexes has been found on a crater from Qarqar (Fabian 2012). Two unique bird shaped vessels have been found at Palmahim (Gophna and Lifshitz 1980, 4–6) and the spread out wings of the birds resemble the so called bird-shaped standard (Bar-Adon 1980, 102). Two birds are also found on a pottery vessel discovered in Northern Negev (Amiran 1986). The vessel has the same basket handle found on copper jars in Nahal Mishmar. A pottery version of the copper jar is also known from the mortuary site of Kissufim Road (Goren and Fabian 2002, fig. 4.2).

Ceramic figurines with the protruding nose have also been found (Gal *et al.* 1997, 153). The “The Gilat Woman” ceramic figurine (Commence *et al.* 2006, 742–746; Joffe *et al.* 2001) is sitting on an object similar in shape to a copper crown. Ivory figurines (Perrot 1959) discovered in Bir es-Safadi also have the characteristic Ghassulian nose.

The complete list of analogies between motifs found in copper artefacts and rest of the Ghassulian material culture is too lengthy to be present here, and what we offer is an overview of commonly shared motifs. However, the overview clearly demonstrates that no other medium exhibits the variety of motifs found in copper artefacts.

These common motifs not only connect the copper artefacts with the rest of the Ghassulian material culture world views,

but also affirm that metallurgy should be treated from symbolic and ritual perspectives. In the following section, we will discuss symbolic meanings and ritual significance of these artifacts and the probable process of their production.

The Ghassulian copper symbols in socio-ritual context

The motifs on the copper artefacts represent all aspects of the world of the 5th millennium Southern Levant: people, wildlife, domestic animals, tools, weapons, probably flora, and numerous other abstract motifs, some of which may signify abstract concepts. Admittedly, interpretations of floral motifs, which are of less obvious shape, are more problematic than others, but it is likely that some of the identifications of motifs are correct. In addition, the horns might have been used for liquids, adding other aspects of surrounding biological and material world. Even if we exclude the floral motif and the liquids, the variety of symbols found in copper artifacts is far greater than in any other medium.

We turn now to the axe (Fig. 14.4, 3) mentioned above and the concept of skeuomorphism. Skeuomorph is an artefact, or a part of an artefact, designed to mimic material or appearance other than the one of which the artefact is made. There are different reasons for producing a skeuomorph such as production of ceramic vessels that imitate more valuable metal vessels (Frieman 2010, 37), which is hardly case in the case of a Ghassulian copper axe. Another explanation of skeuomorphism is sympathetic magic (Knappett 2002, 111). The object is made to look like another object, so that it would have magic power over that object, like in the case of voodoo-dolls, suggesting that the person producing such objects is a magician.

In case of Nahal Mishmar axe, a new material and technology are used to produce an artefact in a shape of the well familiar flint axe, which mimics a more common raw material. It is, indeed, a representation of a flint axe in a new medium. Through the creation of this axe, and the creation of axes, chisels and the other artefacts described above, the Ghassulian metal-workers produced ceremonial tools, symbols, and not utilitarian artefacts. In this context it is worth mentioning another ceremonial tool, the sickle made of ivory uncovered at Bir es-Safadi (Perrot 1964, 92, pl. 3.1). In producing the copper artefacts, the smiths demonstrated their power of material transformation, their unprecedented control over the new technology, and through it, symbolically, over the physical world.

The socio-ritual context of Ghassulian metallurgy

Why did the Ghassulians choose copper as the medium in which to express, so diversely, different aspects of their world? Considering the amount and variety of copper objects, as well as the sophistication of their production, we should not assume that this was accidental, but rather look for reasons behind this

conscious choice. Copper metallurgy was a newly developed and highly sophisticated technology of the later phase of the Chalcolithic period. It is unknown whether the technology was locally developed since there are no earlier examples of the lost wax technique and the no plausible sources from where the copper-working technology could arrive. Even though there are earlier dates for copper smelting in south-eastern Europe and Iran (Frame 2004; Radivojević *et al.* 2010), the finds are not comparable to the Ghassulian metallurgy in the scale of production, sophistication of the casting techniques and the abundance of artefacts.

It has been suggested (Goren 2008, 393) that when a new technology develops, it goes through a phase of intensive ritualisation, while the practical use of the products of the technique are only subsequently explored and developed. The Ghassulian metallurgy reflects this phase, both in the nature of the artefacts and their early date. Everyday practical use tends to involve extensive production of simple forms and, while it might appear so in case of maceheads, it is not comparable to the quantities of flint tools. It is problematic to restrict the explanation of prehistoric metalworking to aspects of craft specialisation and economy (e.g. Craddock 1995; 2001; Levy and Shalev 1989; Shugar 2000), since it overlooks the ritual significance of the craft (Budd and Taylor 1995). In addition, the role of ritual in coordinating production is fairly common in pre-industrial societies (Pfaffenberger 1992, 501).

The Ghassulian copper assemblage readily suggests that metallurgy was highly significant for the build-up of the communal identity. Through identity, people perceive themselves and one another as belonging to certain group in which they play an active part (Díaz-Andreu and Lucy 2005, 1). Individuals trace their sense of belonging to a certain group through shared practice and material culture (Casella and Fowler 2005, 7–8). On the one hand, copper artefacts have a potential to serve as the symbols of communal and ritual identity, while on the other hand, a group of individuals, metal-workers, establishes its role and identity within the society through producing such symbols. We have already mentioned the potential magical value of symbolic artefacts, and this probably qualified the Ghassulian metal-worker as a magician. The symbolic role of artefacts suggests that the technology was understood not only in practical terms, but also conceived in the realm of ideas, symbols and beliefs. The active role of artefacts in social interactions, especially ritual, has been discussed extensively, both through study of symbols (Hodder 1982) and material agency (Gell 1998; Knappett and Malafouris 2008). According to Costin (1998, 3), it is during the creation of these artefacts that they become invested with the meaning and power. In other words, if objects are ritual, it is highly probable their production was ceremonial.

This is why we argue that the technology itself – the production process, from preparing the smelting to the finished artefacts – was ritualised. There is ample ethno-historical evidence to support this proposition. The ritual artefacts were

not merely physical products; they were invested with meaning and power to act and communicate during rituals.

Considering in terms of ritualised production the abundant evidence of metalworking at the Nahal Beer Sheva sites, we suggest that those sites emerged not only as the centers of new technology, but also as centers of new ritual practices incorporated in metalworking. Moreover, the distribution of archaeometallurgical debris in the features of the sites, indicate that the ritualised production was not secretive as has been suggested (Levy and Shalev 1989, 366). Even though some metallurgical activities were conducted in the subterranean units (Perrot 1955), there are numerous indications of above-ground activities, including smelting furnaces (Gilead *et al.* 1992; Shalev and Northover 1987). No fencing or isolation of metallurgical installations, which would suggest that the metalworkers intended to keep their practice secret, was reported. Instead, it is more likely that the ritualised production of metals and metal artefacts was a significant ritual event, important for the community in general. The diversity of Ghassulian ritual practices, beyond gods and temples, has been shown (Gilead 2002; Rowan and Ilan 2007) and the metalworking rituals reaffirms this diversity.

Ghassulian metal-workers and copper artefacts as agents

It is common for ritual objects to be conceived as powerful, as being invested with a magical potential and thus, as having a life of their own, as having agency – the ability to influence and contribute significantly to the ritual and its success. Although initially defined as the intentional or unintentional acting power of humans (Giddens 1984, 9), it is considered that artefacts can pose agency too. Gell (1998, 17–21) makes a distinction between *primary* agency of human social agents and *secondary* social agents – objects. This division emphasises both hierarchy and interdependence between different agents; while primary agents have the power to act and affect the world and society, either intentionally or unintentionally, they do so in a material world – a world of objects. Secondary agents provide the medium for action. If a ritual artefact is considered a secondary agent of ritual agency, than the master of ritual – be it a priest, shaman or chief – is the primary agent, who exercises its power through ability to control and direct the ritual.

In case of the Ghassulian copper metallurgy, the most apparent control is in the hands of the smith, who transforms the ore – rock – to metal and casts it into symbols with ritual agency. The artefacts did not suddenly turn out to be ritual during the ceremony – they were made ritual. Investing them with the ritual and magic agency was part of their production and we suggest that the Ghassulians used copper solely for rituals. Although pottery and lime-plaster have been produced earlier, these transformations are neither as striking nor as obvious as turning stone into metal. The heath and the vivid

colours of the smelting furnace must have dramatised the process, making it an even more extraordinary event. The research of Ghassulian metallurgy concentrates mainly on rational-technological aspects of the craft although it has been shown that the ritual-rational dichotomy, so embedded in the contemporary western thought, is not universal but rather a modern social construct (Brück 1999).

Ritualisation of metalworking

The transformational nature of metallurgy has been often emphasised as the reason for its frequent ritualisation. Looking at it this way, it is not surprising that in many societies – from Siberia to Africa – there are cases of smiths being either closely related to shamans or priests, or of smiths being religious figures (Cline 1937, 131–139). The problem is that it is impossible to excavate the ritual, and the archaeological materials are somewhat limited on their own, which is why we turn to ethnography.

Metallurgy can be ritualised either through myths and legends, through ritualisation of the actual metalworking, or both. Examples that demonstrate this have been documented around the world, and the most numerous and detailed reports come from Africa. We will offer here only a brief overview of the aspects of ritualisation.

Among the peoples of Siberia metallurgy is ritualised and the famous saying “Smith and shaman come from the same nest” comes from the Siberian Yakuts (Eliade 1978, 81). Their initiation rites of novice smiths have been documented (Popov 1933, 262) as well as myths relating the smith not only to the shaman, but also to the civilising hero (Eliade 1978, 82). The role of the smith as the civilising hero, who brought agriculture, metalworking and social organisation, prevails in numerous African mythologies (Eliade 1978, 93; Herbert 1993, 32, 151–155; Richards 1981, 226–227, 232). Smiths are also frequent participants of ancient Greek myths (Blakely 2006; Sawyer 1986) and in Canaanite and Sumerian myths (Dietrich and Loretz 1999; Hallo 1971; Kramer and Maier 1989). Famous smiths are known from the Bible as well (Lewy 1950–1951; Sawyer 1986).

Rituals start with the preparation for smelting and are too elaborate to be described in detail. Most common is the engendering of metallurgy, making it a process where metal is borne out of a sexual intercourse between female and male entities (Eliade 1978; Goucher and Herbert 1996; Herbert 1993; Richards 1981; Schmidt 1996b; 1997; 2009). Thus, objects such as furnaces, bellows, tuyères, etc, acquire the role of female, male or specific reproductive organs. Connection with ancestors is often considered important and is mostly exercised through chants and prayers during the process (Herbert 1993, 60–70; Richards 1981, 229) or in the contents of medicines used. Medicines are substances used during the smelting to ensure the successful outcome of the process. The lists of medicines are long (e.g. Cline 1937, 130–139; Goucher and Herbert 1996,

44; van der Merve and Avery 1986, 253–254, 256–257) and commonly include anything from slag leftovers from ancestral smelts to blood and body parts of scarified animals and plants otherwise used to treat infertility or other conditions. Taboos are also an important part of the metallurgical ritualisation and relate, mostly but not exclusively, to the exclusion of women from the process (Brandon 1996, 69; Goucher and Herbert 1996, 46; Herbert 1993, 92–94; Schmidt 1996a, 78–93; van der Merve and Avery 1986, 254).

There is a consensus concerning the magical quality of those rituals (Herbert 1984; Richards 1981; Schmidt 2009; van der Merve and Avery 1986) and it has been noted (Gilead 2002, 122), that it is sensible to assume that magic, considering its universal nature, was practiced by the Ghassulians as well. The aforementioned examples support our idea that Ghassulian metallurgy, which was a newly adopted practice, was conceived in the realm of magic and ritual. The purpose of looking into these ethnographic examples is not to draw direct analogies, but to look for the common aspects of magic and ritual in traditional metallurgies.

Metallurgy, Nahal Beer Sheva and secondary burials: late Ghassulian developments

We discussed earlier the Chalcolithic metallurgy of the Southern Levant as a late Ghassulian phenomenon. We have also emphasised that the introduction of metallurgy was not the only change that occurred in the transition between the early and late Ghassulian.

The shift of the bulk of the northern Negev settlements towards the Nahal Beer Sheva area (Gilead 2011, 19–20) is worth noting. This is reflected in the fact that the phase is sometimes referred to as the Ghassul-Beersheba culture (Perrot 1955, 183). While it is difficult to argue that the Nahal Beer Sheva sites owe their establishment to metallurgy, it is plausible that major sites, such as Gilat and Teleilat Ghassul, declined due to the new technology practiced in the Nahal Beer Sheva sites. Copper metallurgy became a new manifestation of Ghassulian spirit and ritual behavior, and the smiths attained a ritual status and power. Petrographic analyses of pottery assemblages from different sites carried out by Goren (1995) show that the pottery assemblage of Nahal Mishmar is the most diversified in this part of the country since it included ceramics that originated from a number of regions. This observation not only refutes the relations between Nahal Mishmar and En Gedi, as suggested by Ussishkin (1971) and Goren (2008), but also establish the hoard as a ritual assemblage that represented different regional Ghassulians settlement.

Ghassulian metallurgy introduced a new ritual behavior, starting with metal-smelting, through shaping of the artefact, to the use of the finished artefacts in rituals. Its transformational quality demonstrated the unprecedented control of the smiths over the material world and suggests that they were most influential members in their communities. Levy (1986a, 1998)

defines the social organisation of the Ghassulians “chiefdom” with a group or an individual in power imposing control over smiths and their production. However, there is no clear evidence of such a society in Chalcolithic times (Gilead 1988, 434). Furthermore, the abovementioned examples of metal-workers being also masters of rituals make it more likely that the smiths were masters of their craft and masters of ritual.

Copper working and secondary burials: two aspects of ritual change

Beyond the introduction of metallurgy and its related rituals, burial customs also changed in late Ghassulian times. There are 91 primary burials at Gilat, an early Ghassulian site (Gilead 2011). They are located in an open space in the southern part of the site, near the alleged sanctuary (Smith *et al.* 2006, 337). Even though inhumations and dislocated burial have been found in Nahal Beer Sheva late Ghassulian settlements, such as Abu Matar (Perrot 1955, 173), they differ from those of Gilat since burials were found in variety of contexts, including burials below walls (Perrot 1955, 173–174) and small burials in stone construction (Perrot 1955, 176).

The only place in the Nahal Beer Sheva that is associated with cemeteries is the late Ghassulian site of Shiqmim, where mortuary customs are quite different from those of Gilat. Cemetery 1, located near Me'zad Aluf (Levy and Alon 1982, 42–46), features 22 mortuary stone circles. Skeletal remains consist of disarticulated limb and cranial bones of minimum 49 individuals, indicative of secondary burials. Cemetery 3 (Levy and Alon 1987) features both cists and grave circles. Cists were used as receptacles for the decaying bodies and were located in the close proximity to the grave circles. Like Cemetery 1, grave circles contained mostly limb and cranial bones, typical of secondary burial. Fragments of ossuaries that were found in Grave Circle 23 at Cemetery 3 further demonstrate the similarity of burial practices at the Shiqmim cemeteries and in the secondary burial caves.

We discuss above the late Ghassulian date of the off-site cemeteries for secondary burial, mostly in caves. These cemeteries feature ossuaries with the above mentioned architectural, zoomorphic and anthropomorphic motifs, signifying close symbolic ties to copper artefacts, few of which found in these burial grounds. The secondary burials and the copper artifacts are of the same cultural phase; share the same set of symbols and, frequently, the same archaeological context. They are two facets of a wider ritual change that occurred in Ghassulian.

The connection between metallurgy and burial-related rituals is may be best illustrated by Nahal Mishmar and its hoard. The Nahal Mishmar hoard was discovered in a niche in a cave chamber (Bar-Adon 1980) and it does not seem that the hoard comes from a burial (Ilan in Golden 2009b, 63). Nonetheless, its location in the cave points to the significance of the cave as a ritual/sacred place.

Several hypotheses attempt to explain the origin and the meaning of the hoard. It has been suggested that the hoard originated in En Gedi (Goren 2008; Ussishkin 1971), although a previous study negated such an option (Goren 1995). Tadmor (1989) suggests that the hoard belonged to traders since the artefacts were made of different alloys which implies that objects were produced by different craftsmen who had access to various ores. Gates' (1992) explanation, fairly similar to that of Tadmor's, suggests that the hoard belonged to nomadic pastoralists who were also the craftsmen. Her explanation focuses on the repair patches found on some of the artefacts (e.g. Bar-Adon 1980, 35, 38, 75). Garfinkel (1994, 176) suggests by that the hoard is an intentional burial of worn out ritual paraphernalia. However, most of the artefacts are not damaged and other reasons for their disposal must be sought.

We suggest that the copper artefacts should be understood in terms of their "life histories" and the ritual behavior of their makers. It is probable that as a ritual cycle has come to an end, so did the "life" of the objects. Whatever the reason, artifacts were laid to rest and their concealed disposal in a cave signifies their vanishing from the community of living, similar to the custom of concealing the dead in the secondary burial caves,

Conclusions

We have shown that the Ghassulian copper artefacts exhibit a variety of symbols such as zoomorphic, architectural, abstract and probably floral and political. Those symbols should not be understood as signifying deities, either unknown (e.g. Elliot 1977) or deities from later periods in the Near East, such as Inanna, Domuzi, etc. (e.g. Merhav 1993), but rather as symbols of the Ghassulian physical and spiritual worlds. Copper artefacts such as chisels and adzes should not be regarded as utilitarian tools but rather as symbolic signifiers of a yet unknown nature. As we have mentioned, they have no use-wear and were unfit for practical usage. The most illustrative example of a tool symbol is the axe with decoration resembling a rope that tied a stone axe to its handle. The shaft-hole suggests that it was displayed in a ritual in a manner similar to the way maceheads and standards were displayed.

Beyond their symbolic decoration, the actual processes of smelting and casting these artefacts should be understood in terms of ritual behavior. The contemporary western understanding of metallurgy is fairly recent and it cannot reflect the way metalworking was practiced and conceived by the Ghassulians. The symbolic and ritual nature of the artifacts supports this claim. Understanding metallurgy, beyond its technical aspects, as a ritual practice, has implications on our understanding of the ritual practices of the late Ghassulians. We assume that metalworking, in the Nahal Beer Sheva sites for example, was a ritual practice of its own right. The master of the craft created copper artefacts as a master of ritual. By transforming the stone into metal and further casting it into

sacred symbols, he demonstrated his unprecedented control over the material world.

Several features characterise the late phase of the Ghassulian, after centres such as Gilat and Teleilat Ghassul declined: sites along the Nahal Beer Sheva were established, metallurgy emerged and secondary burial becomes predominant. Even though the late Ghassulian continues in many aspects the early Ghassulian, the transition to the late phase signifies a dramatic change in world views and ritual.

It is difficult to relate the introduction of metallurgy to the emergence of secondary burial in off-site cemeteries and to the prominence of the Nahal Beer Sheva sites. However, it seems that this change was most pronounced in the ritual sphere and it might be that controlling the new ritual behavior – the metalworking – was crucial for the growing importance of the Nahal Beer Sheva sites.

Secondary burials sites, mostly in caves, are also a late Ghassulian feature. This custom can be tied to the copper artefacts on two grounds. To start, copper artifacts are found in the caves with secondary burials. In addition, we have demonstrated the close symbolic ties between the ossuaries, funerary offerings and copper artefacts. In this context, we regard the Nahal Mishmar hoard as an intentional cave burial of copper artefacts. Even though we cannot yet explain the relationship between metallurgy and secondary burials, both signify a clear ritual shift between early and late Ghassulian.

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