On Chalcolithic maceheads and spinning implements

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Introduction

We are grateful to Ben-Yosef *et al.* (above) for their thorough critical evaluation of our recent paper. We identified a group of modified wooden shafts originating in two large complex caves with Late Chalcolithic (Ghassulian) burials in the Negev Desert (Israel) as the earliest Levantine wooden spinning implements (Langgut *et al.* 2016). Their detailed assessment culminated in the alternative hypothesis that the wooden objects functioned as sticks that carried metal maceheads during rituals. This raises several issues that merit serious consideration. Our response to Ben-Yosef *et al.*'s suggestions is divided into two sections, each concentrating on one of the two main technologies under discussion: spinning and metallurgy.

Spinning

The fundamental nature of archaeology is that of repeated surprises. While essentially built on comparative analysis, the evaluation of new discoveries and, specifically, of technological instruments never before described or analysed, cannot be *solely* based on long-held technological concepts. That is particularly so if they are sourced in cultural spheres temporally and spatially remote from the newly discovered artefacts. Most of the arguments presented by Ben-Yosef *et al.* above are drawn from artefacts and artistic representations found in Egypt and Mesopotamia—regions very different from the southern Levant. They are also millennia later in date than the Late Chalcolithic Ghassulian Culture (e.g. the presence/absence of distaffs, the position of spindle whorls and the shape of grooves in spindle shafts in Near Eastern spinning technologies). Although important, these arguments cannot serve as a starting point for determining the technological status of spinning in the Chalcolithic of the southern Levant, which should first and foremost be based on contemporaneous data.

The main point of the critique addresses the biconical lead artefact found fitted onto a wooden shaft at Ashalim Cave, which they perceive as a ritual mace (see also Ben-Yosef

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et al. 2016: 499). This agrees with our initial interpretation that the lead object had been a macehead, albeit unique due to its relatively small size and the rarity of its raw material, compared with the hundreds of Late Chalcolithic metal (copper-based) maceheads known to date (Bar-Adon 1980: 116–31; see also Sebbane 2016: 444–45). We suggested that, later, the macehead was secondarily used as a whorl (Yahalom-Mack *et al.* 2015; Langgut *et al.* 2016: 986).

The main argument posited by Ben-Yosef *et al.* against the identification of the Qina Cave shafts as spindles is their assumption that these shafts once held cultic metal objects intended for ritual processions (following Bar-Adon 1980: 202), which were allegedly robbed from the cave following their deposition. This *argumentum ex silentio* is based on nothing more than mere speculation. There is no evidence for post-burial removal of artefacts from the inner sections of Qina Cave during or after the Late Chalcolithic, nor for modern looting. Metal artefacts, if originally deposited, should have been discovered during our recent work at the cave, much as they appear in other cave burials (see below). Secondly, the placement of mundane, utilitarian objects as grave goods is a common practice in Ghassulian burials. These include spinning-related artefacts (i.e. spindle whorls), which are also present in Qina Cave as part of the mortuary assemblages (for parallels, see Perrot & Ladiray 1980: fig. 77: 6; Rowan 2005: 115 & fig. 9.5: 1–4; Shalem *et al.* 2013: 330 & fig. 9.4: 1–7). Such examples contradict Ben-Yosef *et al.*'s assertion that spindle whorls are not found in Ghassulian mortuary contexts, although their discussion is based solely on burials within settlement sites, and not on the more common Ghassulian practice of secondary burials in extramural cemeteries (mostly in caves, e.g. Nativ 2014; Rowan 2014). By contrast, metal artefacts are relatively rare in Late Chalcolithic burial contexts, and cannot be viewed as part of an essential mortuary component as Ben Yosef *et al.* imply (compare van den Brink 2005 with Sebbane 2016: 455 & footnote 39; *contra* Golden 2010: 66).

Remains of wood were found inside very few of the hundreds of artefacts comprising the Nahal Mishmar Hoard from the neighbouring Judean Desert (Bar-Adon 1980: 40–41, 116). Hence, Late Chalcolithic wooden shafts should not automatically be interpreted as ritual sticks, especially if discovered in significantly different contexts—as are the cases at both Qina and Ashalim Caves. Moreover, a careful examination of the four maces or sceptres from Nahal Mishmar, republished by Ben-Yosef *et al.* (above: fig. 2), shows that three examples (nos 62, 71 & 115 in Bar-Adon 1980) contain no wood at all (no. 62 has a twisted thread within its shaft, and no. 115 has a broken reed). The fourth (no. 107) contains a thin wooden stick with a pointed tip that barely protrudes out of the sceptre. This stick clearly could not have been used to carry the heavy metal item (Bar-Adon 1980: 83). Ben-Yosef *et al.*'s suggestion above that in the Cave of the Treasure finds "there is direct evidence for the use of linen textiles to wrap maceheads or wedge them onto a wooden shaft" is entirely unfounded: the only four items from the Cave of Treasure with textile remains have no traces of wood and nothing in their configuration to support either suggestion (see Bar Adon 1980: 119 & 153; also Ben-Yosef *et al.* above: fig. 3). Thus, the sparse associations between wood or textiles and metal artefacts in the Nahal Mishmar Hoard do not support Ben-Yosef *et al.*'s interpretation regarding the ritual use of wooden sticks, and evidently cannot contribute to the interpretation of the Qina and Ashalim shafts. It should also be

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stressed that all shafts from Ashalim and Qina Caves were modified either with grooves, sharpened tips or intense polishing, the latter most probably resulting from intensive use (Langgut *et al.* 2016: figs 7 & 8). Additionally, the occurrence of linen textiles and wood remains within two basalt spindle whorls from the Judean Desert presented by Ben-Yosef *et al.* (above: fig. 4) supports our assumption that the flax fibres found on the Qina Cave shafts were indeed related to spinning activity.

As for the possibility that the Ashalim Cave artefact was used as a spindle at some point in its use-life (Yahalom-Mack *et al.* 2015; Langgut *et al.* 2016), most of the 'negative' arguments raised by Ben-Yosef *et al.* were already addressed in the original paper (Langgut *et al.* 2016). Their claims that efficient spinning would be impeded by the shaft's rough surface, its asymmetrical pointed tip and the shape of the notch grooved in its upper part refer to the current condition of the shaft, more than six millennia after its deposition. The shape and surface properties of wood, however, even if well preserved under dry conditions, commonly change with time following desiccation. Wooden items can also bend when containing tension wood with gelatinous fibres, a mechanical tissue formed regularly in the upper side in any *Tamarix* branch that did not grow vertically (Fahn 1990). There is no reason to assume that the lead object was not symmetrical when manufactured (contra Ben-Yosef *et al.*), and that its current asymmetrical form is due to use-wear and/or to post-depositional damage (as suggested by Langgut *et al.* 2016: 986).

We have already stressed that while the lead object is relatively heavy compared to typical Late Chalcolithic whorls, it is not beyond the upper limit of known whorl weights (Crewe 1998). Additionally, it is hypothesised that the Ashalim Cave implement was used for plying rather than spinning. This is indicated by the Late Chalcolithic textile industry, which is based on spliced (rather than spun) yarn (Shamir 2014: 145–46). Ben-Yosef *et al.* argue above that the deep notch at the head of the wooden shaft from Ashalim Cave, suggested by Langgut *et al.* (2016) to be a groove to catch yarn while the spindle was whirling, is not a typical spindle groove. As there are no other identified spindles from the Neolithic or Chalcolithic in the Near East, we have no evidence concerning the size, position or depth of such notches, or whether there was a typical standard for their design. From the Late Chalcolithic, we are thus far only familiar with the two grooves identified in Ashalim and Qina Caves, and they show two different forms (Langgut *et al.* 2016: fig. 8, shafts 120 & 127). Finally, the position of the lead object that implies a high-whorl spindle is not only in accord with common Near Eastern practices (as stated by Ben-Yosef *et al.*), but is also supported by the resemblance of Levantine Late Chalcolithic to Pre- and Early dynastic Egyptian yarns, the latter known to be produced by using the high-whorl spindle (Barber 1991: 66–67; Shamir 2014).

Ben-Yosef *et al.* argue that our identification of two wooden sticks from Qina Cave as possible distaffs is problematic, as they suggest that distaffs are very much a Classical European phenomenon. This statement is unfortunately incorrect. Langgut *et al.* (2016: 976) mentioned that the earliest artistic representations of possible distaffs are from mid third-millennium BC Mesopotamia (Barber 1991: 69). Given that spindles and distaffs were commonly produced from perishable materials, such as wood and reed, they very rarely preserve in the archaeological record. Further, being merely sticks, the chances of true distaffs being identified within such archaeological assemblages are even lower than

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those of spindles. As distaffs are not easily identifiable artefacts, our familiarity with them derives mainly from those made of luxury materials (ivory, metal). Indeed, according to Gleba (2011), there is significant confusion in the literature regarding the functional identification of distaffs. Short hand-held distaffs are commonly identified as spindles, while long distaffs have been designated as 'symbolic staffs'. Following from Sauvage's (2014: 222) study of eastern Mediterranean spinning implements, we also suggested the possibility that the wooden shafts from Qina Cave had a versatile function as both spindles and distaffs (Langgut *et al.* 2016: 985).

Metallurgy

A main premise of Ben-Yosef *et al.*'s critique above is their assertion that all Late Chalcolithic metal artefacts "constituted an integral part of Ghassulian cultic practices" and that metal had no utilitarian function within the Ghassulian culture. This assumption, which draws heavily on recent works by Gošić, prompted Ben-Yosef *et al.*'s rejection of any mundane use of the Ashalim Cave object, and, consequently, of the Qina Cave shafts too, although the latter were not associated with metal finds (Gošić 2015; Gošić & Gilead 2015; see also Rowan & Golden 2009: 42). Such a monolithic view of Late Chalcolithic metallurgy as purely ritualistic in nature does not stand up, in our opinion, to scrutiny given the available data regarding the occurrences of metal artefacts and metallurgical remains in Ghassulian contexts (e.g. Levy & Shalev 1989; Golden *et al.* 2001; Shugar 2001; Sebbane 2016). Moreover, it imposes a Durkheimian sacred/profane dichotomy on Ghassulian society, whereas in reality substantial evidence exists for the movement of numerous artefact types (e.g. pottery vessels, flint tools, personal ornaments, spinning-related implements) from the domestic realm to the ritual and mortuary spheres (e.g. Perrot & Ladiray 1980; Ussishkin 1980; Epstein 2001; Levy 2006; Shalem *et al.* 2013). While the metallurgical process may well have been ritually loaded (Gošić & Gilead 2015), the possible utilitarian function of certain metal products (of both simple open casting and the sophisticated lost-wax technique) cannot be excluded. In this respect, Ben-Yosef *et al.*'s treatment of the recent comprehensive study of the Late Chalcolithic maceheads by Sebbane (2016) is specious, as Sebbane makes a clear distinction between simple maceheads (and maces) and sumptuous ones. He argues that the former, which are much more abundant in both the Nahal Mishmar Hoard and Ghassulian culture sites in general, functioned initially as weapons and only later were some of them ritually dedicated (Sebbane 2016: 445, 448–52, 455–57).

A final note relates to Ben-Yosef *et al.*'s (2016, and above) hypothesis that the recent discoveries of the Ashalim Cave lead object and a leaded copper macehead fragment from a site near modern Bet-Shemesh reflect an episode of supply shortage in the arsenic-antimony raw material commonly used in Late Chalcolithic (copper-based) lost-wax casting. While technological advantages may have driven the use of lead as an alternative material for metal objects in lost-wax casting, its limited use (only 2 out of 86 items tested so far; compare Ben-Yosef *et al.* 2016: online supplementary data) and the notable technological differences between the two objects render any suggestion of this kind speculative at best. Furthermore, these two items are radiometrically placed in the fourth quarter of the fifth millennium

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BC (Ben-Yosef *et al.* 2016: fig. 3; Langgut *et al.* 2016: tab. 1). This overlaps with the dating of most Ghassulian metal (copper-based) finds, including the Nahal Mishmar Hoard (Gilead 2011; Davidovich 2013: 129–31). Hence, there is no chronological gap between the exploitation of different metallic ore sources in the southern Levant that could support the notion of a temporary shortage in the supply of certain raw materials.

Summary

The emerging discourse presented in this paper revolves around frequently neglected and rarely preserved archaeological materials, and demonstrates the significance of desiccated, organic-based artefacts in furthering our understanding of hitherto unknown technological advancements and cultural innovations. Leaving aside the question concerning the nature of the artefacts under discussion, this debate will hopefully stimulate further research into Late Chalcolithic technological trajectories, ritual behaviour and the interrelations between functional and symbolic aspects of material culture.

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