The organization of basanite bifacial production at Giv'at Kipod Quarry, Israel: Towards an 'Alyawara Day' model of extraction

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Abstract:

Hunter gatherers as well as farmers used a variety of lithic raw materials to shape their world, in which some were perceived as having symbolic or mythical content. While the anthropological literature demonstrates that the extraction of raw materials of special significance was often performed differently from that of other more 'ordinary' raw materials, identifying this in the archaeological record is difficult. In this paper we wish to shed new light on this topic using the Late Neolithic-Early Chalcolithic basanite bifacial tool production site of Givʿat Kipod, Israel. In the southern Levant basalt axes and adzes have long been understood to embody greater symbolic content than the flint axes and adzes that dominate the Neolithic and Chalcolithic bifacial assemblages. By comparing the results from our excavations at the site of Givʿat Kipod to other production and extraction sites we exhibit how the organization of production was different than that related to the more common flint extraction in the region. While at most production and extractions sites the manufacture of various types of items is documented and the presence of tools, especially *ad hoc* tools, indicates that a variety of activities were performed at the locale of extraction, in the case of Givʿat Kipod the production was focused solely on the manufacture of bifacials with a marked lack of evidence of other significant activities. We attempt to provide guidelines to characterize different exploitation patterns between raw materials of varied social significance using these differences.

Keywords: ground stone tools, bifacials; basanite; Neolithic; quarry; Givʿat Kipod; Southern Levant

1. Introduction

The role of raw material procurement in hunter-gatherer and early farming societies has been a topic of many studies. These refer to issues such as mobility patterns, trade and exchange, the perception of the landscape as well as to the mythical powers often relating to quarries (*e.g*., Hayden 1987; Darvill 1989; Cooney 1998; Le Roux 1998; Pétrequin *et al*. 1998; Özbek 2000; Wilson 2007; Risch 2011). Significantly, several ethnographic studies demonstrated that different raw material sources are often ascribed different meanings, which

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are associated with distinct procurement strategies (*e.g.*, Binford & O'Connell 1984; Taçon 1991; Brumm 2010).

Archaeologically, the importance of certain raw materials is often argued via the exploration of differences in their treatment and life-history compared to that of other raw materials exploited by the same population (*e.g.*, Cauvin 1998; Healey 2001). While archaeological research invests considerable efforts to produce correlations between artefacts and specific outcrops of raw materials in the landscape (*e.g.*, Campbell-Smith 1965; Gluhak & Hofmeister 2009; Özbek 2011), we still know very little about how behavioural patterns and procurement strategies differed between the extraction of common raw material and raw materials of some "special" significance. In this paper we attempt to explore such differences through an in-depth investigation of the basanite bifacial production site of Giv'at Kipod, Menashe Hills, Israel, the only basaltic axe production site known in the Levant, and comparison to other flint workshops. Although bifacial tools, primarily axes and adzes, are widely considered to have been endowed with symbolic as well as utilitarian significance, it is often observed that the symbolic content varies greatly (*e.g.*, Bradley & Edmonds 1993: 53; Thomas & Tilley 1993; Cooney 1998; Pétrequin *et al*. 1998). In the southern Levant, bifacials made of raw material other than flint, are repeatedly argued to bear greater symbolic weight (*e.g.*, Rosen 1997: 97; Yerkes *et al*. 2003; Barkai 2005: 39-40).

Drawing on the results of our excavation, the organization of basalt bifacial production at the site of Giv'at Kipod (Shimelmitz *et al*. 2005; Rosenberg *et al*. 2008; Rosenberg & Shimelmitz 2010), is reconstructed. By way of comparison with other quarry and production sites in the southern Levant, differences in the organization and exploitation of raw materials are then defined. It is argued that unlike other quarry sites, in which a wide range of tool types were produced (*e.g.*, Wreschner 1963; Ronen & Davis 1970; Gopher & Barkai 2011; Nadel *et al*. 2011; however see Vardi 2015), the production sequences at Giv'at Kipod are indicative of solely of bifacial manufacture. Moreover, there is no evidence that any other activity took place at the site. Thus Giv'at Kipod represents a very specific and, in a sense, specialised field of practice. However, no evidence for standardization in morphology or size was noted, pointing away from specialized craft production (*e.g.*, Costin 1991; 2005; Shafer & Hester 1991; VanPool & Leonard 2002). Using these differences we attempt to provide guidelines to characterize varied exploitation patterns between raw materials with different social significance.

2. Raw material and bifacial tools in the southern Levant

The geological landscape of the Levant is rich in flint outcrops scattered over most parts of the region with a distance of no more than a day walk from any point on the map (*e.g.*, Bar-Yosef 1991; Hovers 2001; Delage 2007). As such, the prevalence of flint among knapped stone tools is apparent already in the Lower Palaeolithic, with the exception of some of the earliest sites in the Levant, where basalt was also common (Bar-Yosef & Goren-Inbar 1993; Goren-Inbar 2011). The intensive use of flint in the Levant probably reflects the greater control knappers could exert over the reduction process, and the sharper edges produced (*e.g.*, Bar-Yosef 1994).

The exploitation of rock types other than flint intensified with the introduction of new production technologies during the Epipalaeolithic period, when ground stone tools made of basalt, limestone, and other raw materials became prevalent (*e.g.*, Wright 1993; Rosenberg 2011; Rosenberg *et al*. 2012). Nevertheless, even in this period, flint clearly dominated the lithic assemblages (*e.g.*, Shea 2013).

While within the Neolithic some artifacts were produced from specific raw material, such as sickle blades that were made from flint (*e.g.*, Gopher 1989) and the Pre-Pottery Neolithic A

(PPNA) bowls and platters that were made of limestone (Rosenberg 2008), other artifacts were made from a range of raw materials (*e.g.*, Wright 1993; Rosenberg 2011). The use of a variety of raw materials to manufacture a specific tool type characterized the production of bifacial tools in the southern Levant. Although primarily made of flint (*e.g.*, Barkai 2005), some were produced on basaltic rocks, limestone, and other more 'exotic' raw materials (*e.g.*, Garfinkel & Dag 2006; Rosenberg *et al*. 2008; Rosenberg & Gopher 2010; Rosenberg 2011; Gluhak & Rosenberg 2013; Rosenberg and Gluhak 2015; Vardi 2015).

Axes and adzes have long been identified as instruments used by ethnographic horticulturist and Neolithic societies for altering their environments and as a means of symbolic expression, specifically pertaining to men (*e.g.*, Campbell-Smith 1965; Burton 1984; Claris & Quartermaine 1989; Darvill 1989; Bradley & Edmonds 1993: 53; Pétrequin & Pétrequin 1993: 359-361; Thomas & Tilley 1993; Cooney 1998; le Roux 1998; Pétrequin *et al*. 1998). These tools first appear in the southern Levant during the PPNA period (ca. 11,500-10,500 Cal BP) and were manufactured and used until the end of Chalcolithic Period, ca. 3,900 Cal BP (*e.g.*, Barkai 2011). The rare cases of bifacial tools that were made of materials other than flint, and specifically miniature bifacials, were often argued in the Levant to be "votive" or to bear a greater symbolic content than the more common flint bifacials (*e.g.*, Rosen 1997:97; Barkai 2005:39-40). In the case of the PPNA, this was systematically examined and it was demonstrated that the ground stone bifacials mostly lacked use-wear, while the flint bifacials were heavily used and re-sharpened (Yerkes *et al*. 2003; Barkai 2005: 369).

3. Giv'at Kipod

Giv'at Kipod is located on the Manasseh Hills, Israel, ca. 20 km east of the Mediterranean Sea shoreline (Figure 1). The site has been explored since 2005 and both surveys and excavations revealed that it was a major extraction site for the production of bifacial tools (Shimelmitz *et al*. 2005; Rosenberg *et al*. 2008). The hill is one of several isolated igneous rock hills found along the southwestern margins of the Jezreel Valley. The lower outskirt of the hill is used for agriculture today and the remains of a small Roman-Byzantine fortress are found on the summit (Raban 1999: 60). The activities, in late antiquity and in modern times, clearly damaged the quarry site and concealed much of the prehistoric remains.

The slopes of the Giv'at Kipod hill are covered with knapped basanite items (Figure 2). Specifically, the southern and southeastern slopes are the richest in terms of accumulations of knapped material, and apparently less affected by later activities. These accumulations consist of hundreds of thousands of flaked basanite debitage and numerous rejected rough-outs. A close look at these massive concentrations of knapped material reveals that, apart from basanite, items made of other materials are extremely rare, and none can be ascribed to the Neolithic-Chalcolithic periods.

The largest of these accumulations, a massive pile of production waste (ca. 50 m long, 15 m wide and ca. 1.0 m thick), was selected for excavation and marked as Locus 1 (Figure 3). The surface of the pile is packed with thousands of production waste items, consisting of fragments, flakes, and bifacial rough-outs. During the excavations, a probe, 1 m wide and 10 m long, was marked, running along the pile's south-north axis. Six m² within it were excavated (I1, I2, I5, I7, I8, I9, Figure 4). Each square in the grid was treated as an independent spatial unit and excavated in 10 cm spits. Sediments were sieved through a 2.4 cm screen. During the field work we separated the chunks and chips from the rest of the assemblage for counting and weighing. All rough-outs and waste items bearing a bulb of percussion were registered and taken for further analysis.

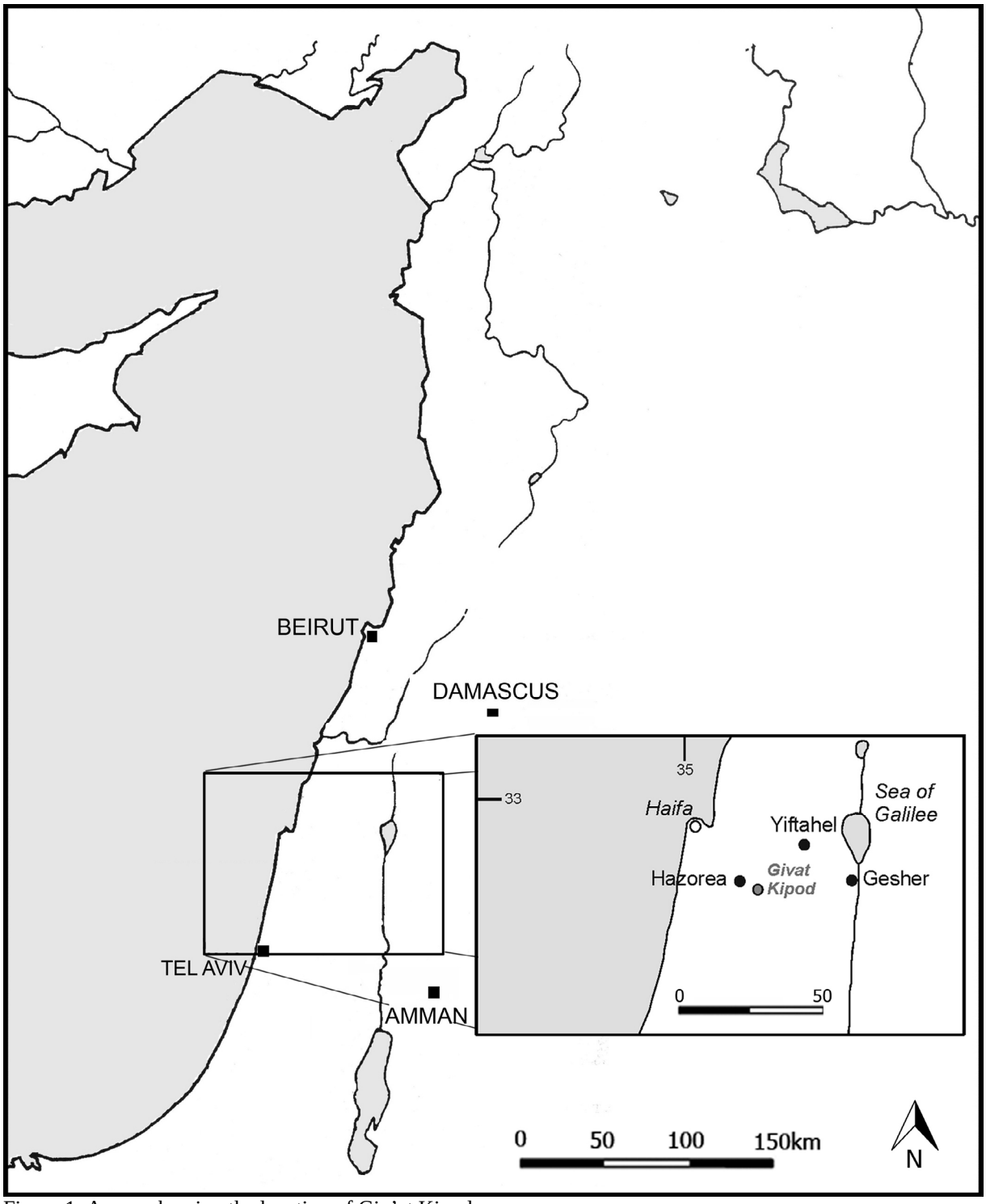

Figure 1. A map showing the location of Giv'at Kipod.

During excavations it became clear that the accumulation of basanite items in Locus 1 is dense and spread from surface to bedrock in the centre of the pile. The areas near the main pile now covered by basaltic sediments are in fact also rich with production debris, suggesting that the scale of production at the site was much more intensive than we can observe today. The centre of the pile reflects the densest accumulation (Figure 5). For example, the excavated volume of Square I5, a single cubic meter, yielded 9,320 knapped items with a total weight of 956 Kg (reflecting the high density of knapped rock compared to soil).

Figure 2. A view over the southern slope of the site.

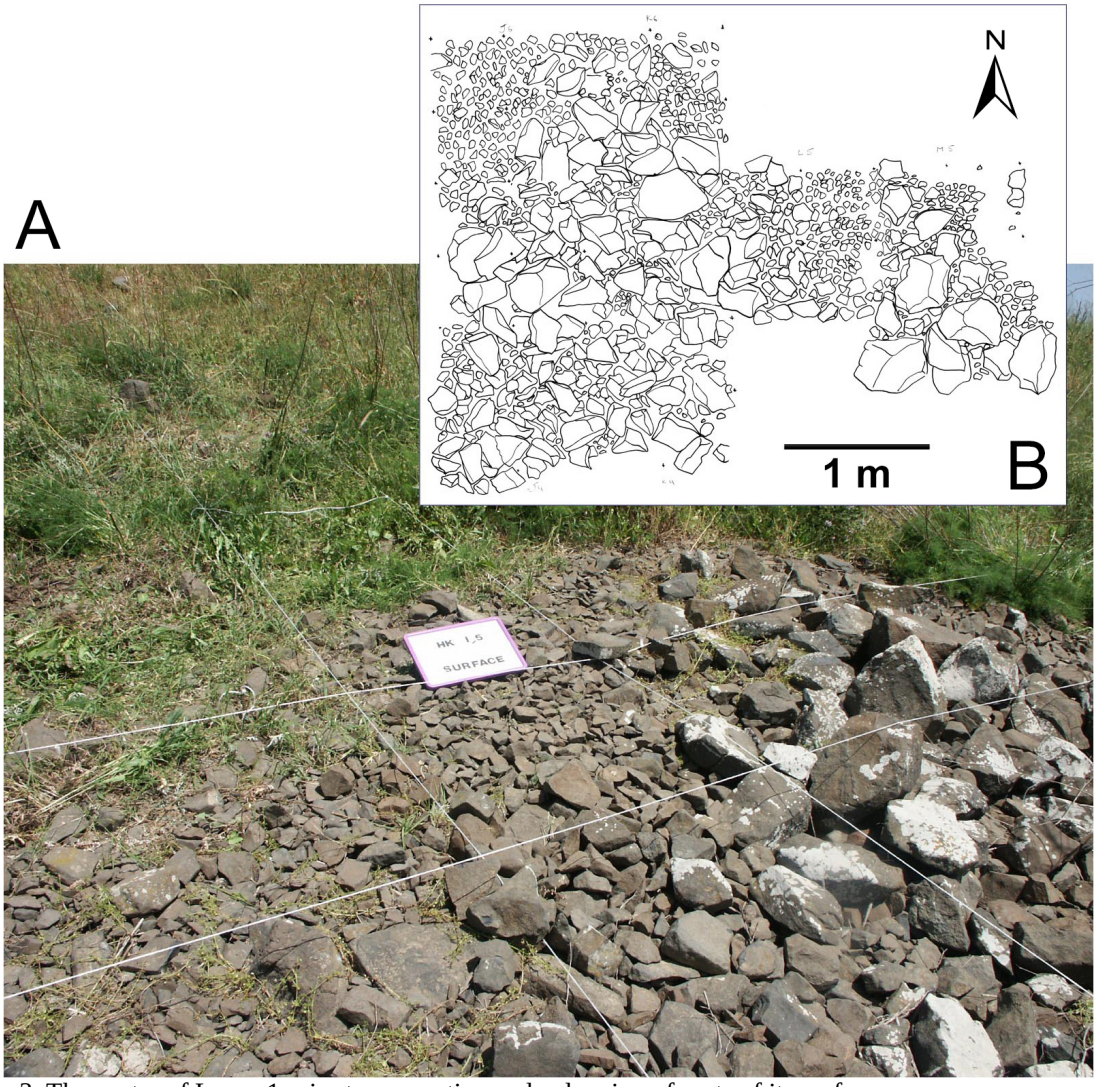

Figure 3. The centre of Locus 1 prior to excavation and a drawing of parts of its surface.

Figure 4. Squares. I7-I9 in Locus 1 during the 2007 excavation.

Two stratigraphic layers were distinguished at the centre of Locus 1: the lower is characterized by basanite items embedded in black-red soil, with a thickness of ca. 20-40 cm and the upper is characterized by accumulation of items with almost no sediment at all (Figure 6). Because the accumulation of sediment is later than the deposition of the waste the differentiation between the two layers noted above is apparently of little significance in terms of the original deposition of the lithic items. We have no clear information concerning the quarrying activity itself, as we reached the bedrock only in a small area in square I5. However, based on the accumulated data form the topography of the pile and the presence of large boulders (some 30-50 cm across), we can suggest that large boulders were quarried out, modified and reduced first into large flakes and then into preforms on site, and that the knappers discarded the production debris downhill.

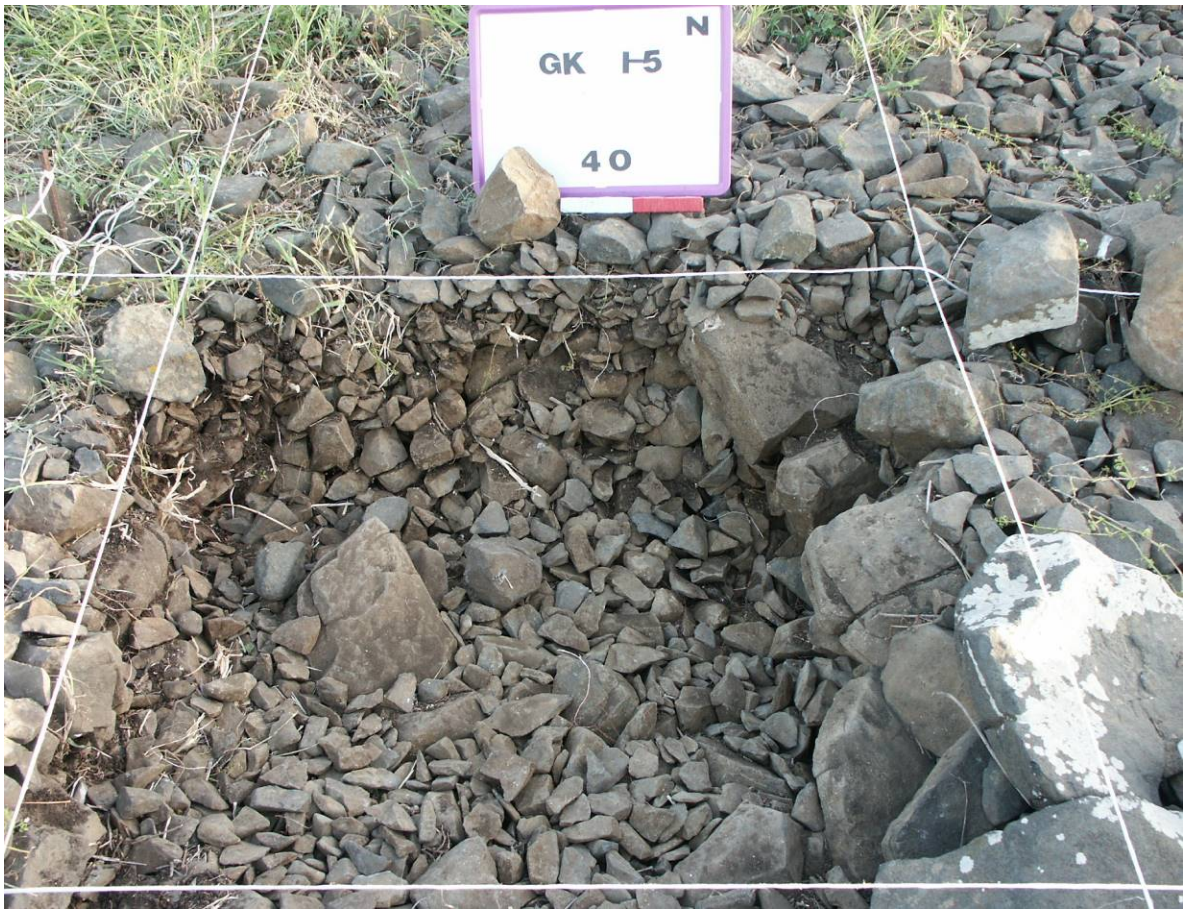

Figure 5. Sq. I5 in Locus 1 during the 2005 excavation.

Figure 6. Square I5 showing the lower part packed with sediments.

No indications of other Neolithic-Chalcolithic activities were found during the survey and excavation. In fact, the only non-basanite items found are some Roman-Byzantine pottery sherds and a few glass fragments, originated probably from the fortress atop of the hill. Small limestone chunks as well as highly decalcified, miniature flint pieces and a few flint chips that are not heavily patinated were found as well. The heavily eroded and decalcified flint items are similar to Palaeolithic material in the region (*e.g.*, Olami 1984). The only reliable information concerning the dating of the Giv'at Kipod quarry and production site is based on the provenance study (Gluhak & Rosenberg 2013), which identified bifacials made of Giv'at Kipod basanite in a series of sites spanning from the PPNA to the Late Neolithic-Early Chalcolithic period.

4. The assemblage of Giv'at Kipod (Locus 1)

4.1. The waste

From the six square meters excavated in Locus 1, ca. 150,000 basanite items were retrieved, weighting more than two tons (Table 1). The majority of the material, both in numbers and weight, are chunks and chips (<1.5 cm). The chunks are predominantly broken, knapped material (non-proximal flake fragments) and various other basanite pieces. This is indicated by the frequent presence of fragments bearing a ventral surface and scars of previous removals along their dorsal face. Items that are smaller than 1.5 cm but still bear a bulb of percussion were labelled as micro-flakes. Other kinds of production waste, including mainly flakes (n=4,366), but also rejected rough-outs (n=116) constitute only 285 kg (ca. 3% in reference to number and ca.12% in reference to weight).

Within the waste we recorded flakes bearing weathered dorsal surfaces which constitute a remnant of the original quarried block of raw material (pre-knapping) as primary elements (bearing at least 30% of the dorsal surface). A process of "decortication" of basanite was noted in other cases (*e.g.*, Ishimura & Addison 2007). Nevertheless, such flakes are few within the assemblage of Locus 1 (2.5%). Flakes are the most common waste artefact found at Giv'at Kipod, constituting 86.9% of the debitage and rough-outs numerically and ca. 50% in weight. The majority of the flakes are characterized by plain platforms. Flakes with different types of modified platforms were recorded separately and are notably less common, constituting only 5.6% of the debitage and rough-outs in numbers and even less in weight. Blades are rare and as none of these demonstrate fine parallel edges or a homogenous cross-section, we believe these are incidental by-products of the bifacial production sequence.

Only one core was retrieved from the excavated volume, while several other 'giant cores' were observed on the surface of Locus 1 (their full description cannot be provided since they are embedded within the pile of Locus 1 in places not excavated yet) (Figure 7). Items bearing remnants of a striking platform from directions other than that they were knapped from were defined as core trimming elements. Although some of these were removed from boulders that were used as cores, most were probably reduced during the manufacturing process of bifacial tools. These appear in a variety of sizes and shapes, probably more common to earlier stages of the rough-out production in which large removals were made. In our preliminary analysis (Rosenberg *et al.* 2008) we mentioned the presence of several retouched items. However, following further study, we now suspect that these "retouched" edges represent, in fact, edge damage, resulting from contact between the basanite items within the pile, especially in places where soft sediments are lacking.

Table 1: The basanite assemblage of Locus 1. *1,154 chunks from the 2007 season were not weighed; their weight was estimated according to the rest of the chunks recorded; **the number of chips is estimated according to series of samples counted and weighed from different squares and spits, including a total of 28,653 chips.

	n	Weight (kg)	% out of debitage and rough-outs (n)	% out of debitage and rough-outs (weight)	% out of all assemblage (n)	% out of all assemblage (weight)
Primary element	126	15.21	2.5	5.3	0.1	0.7
Flake	4,366	147.34	86.9	51.7	2.8	6.3
Modified base flake	279	13.09	5.6	4.6	0.2	0.6
Blade	30	1.60	0.6	0.6	0.0	0.1
Core trimming element	42	8.02	0.8	2.8	0.0	0.3
Core	1	5.20	0.0	1.8	0.0	0.2
Edge damage/ “retouched” items	64	9.26	1.3	3.2	0.0	0.4
Rough-out	116	85.54	2.3	30.0	0.1	3.7
Sum debitage and rough-out	5,024	285.26	100	100		
Debitage and rough-out	5,024	285.26			3.2	12.2
Chunk*	36,203	2004.18			23.1	85.9
Chip**	115,000	42.28			73.2	1.8
Micro-flake	818	0.11			0.5	0.0
Total	**157,045**	**2331.82**			**100**	**100**

Figure 7. Large boulders, 'giant cores' and other waste material on the surface of Locus 1.

4.2. The rough-outs

Rough-outs (Figures 8 and 9) consist of 116 items from the excavated material, while many more were found on the surface near Locus 1 and other parts of the hill. On average they weigh 0.737 kg (s.d. 0.62), although variations are considerable and the heaviest item measures 3.5 kg.

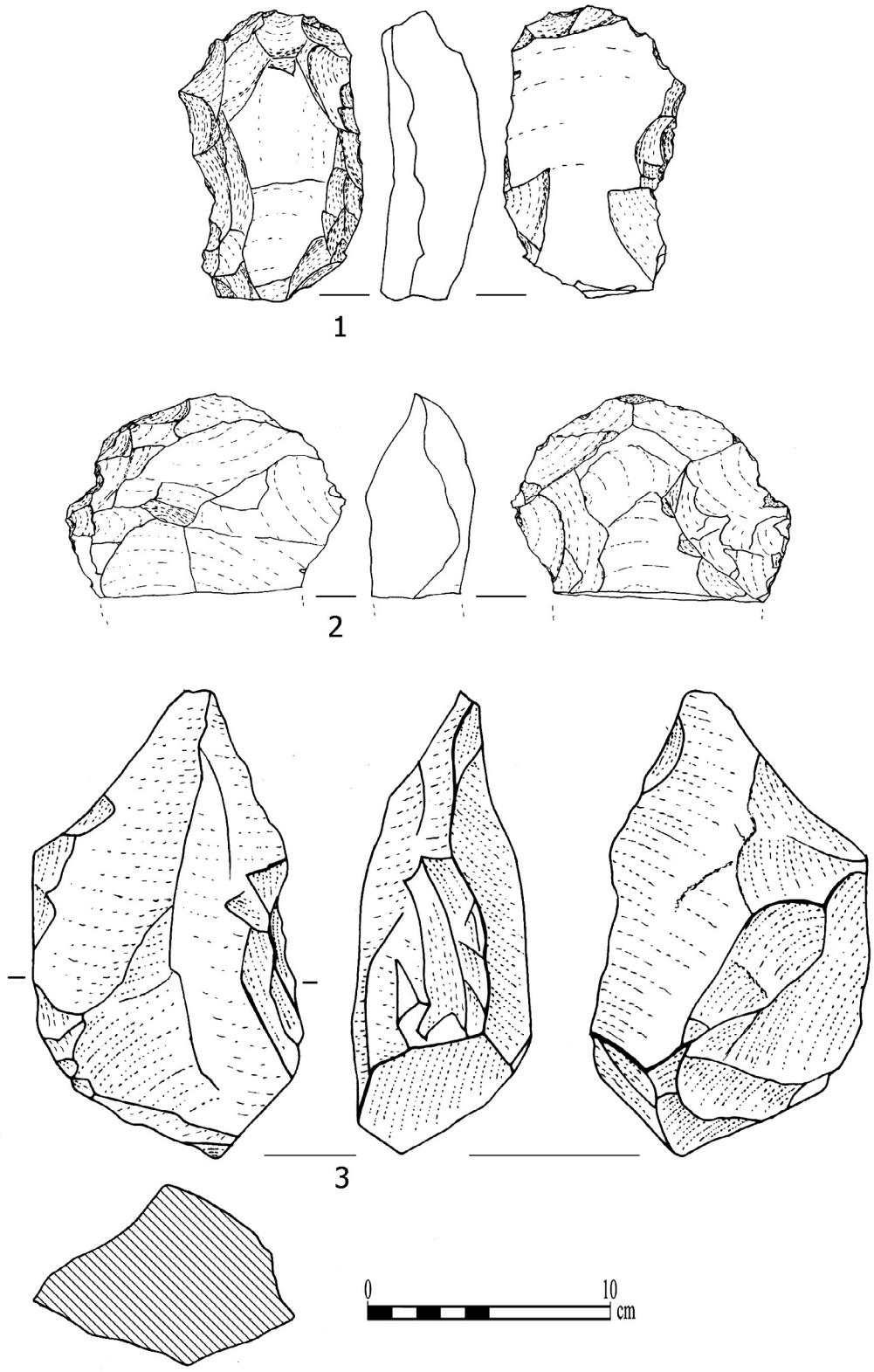

Figure 8. Basanite rough-outs from Locus 1.

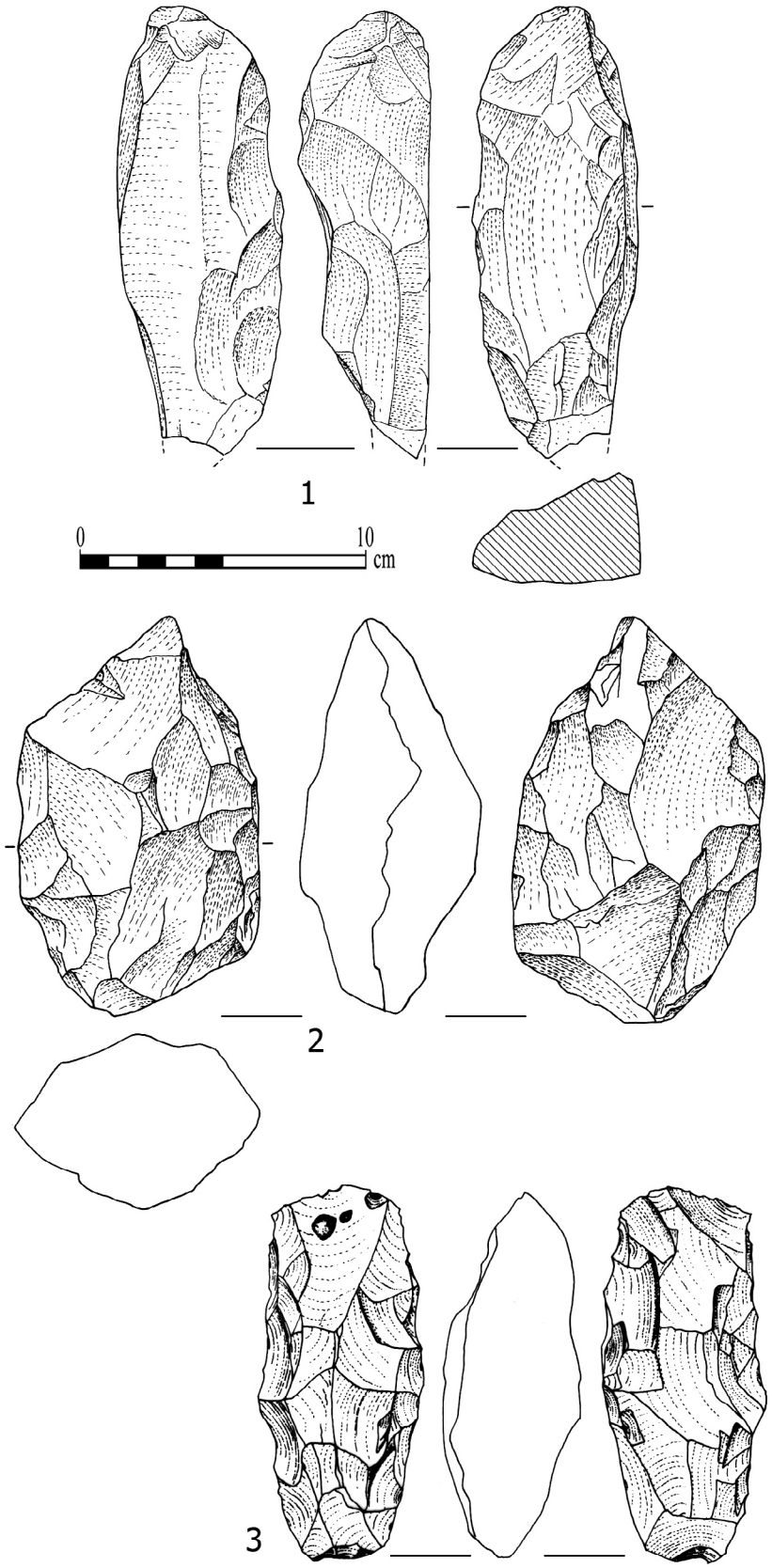

Figure 9. Basanite rough-outs from Locus 1.

We divided the rough-outs into three categories (Figure 10), tentatively representing different production stages, ranging from 'Stage I' rough-outs that include large fragments or flakes bearing only a few flaking scars, through 'Stage III' rough-outs, a category including all

nearly finished items or bifacial rough-outs in which shape was apparently almost complete. These items usually bear the shapes of a well-defined bifacial tool, frequently an axe characterized by a lenticular cross-section. However, most rough-outs in the assemblage were defined as belonging to 'Stage II'. These include items in which a clear, designated shape is apparent or bearing circumferential or any other advanced bifacial flaking that covers at least three-quarters of the item's surface.

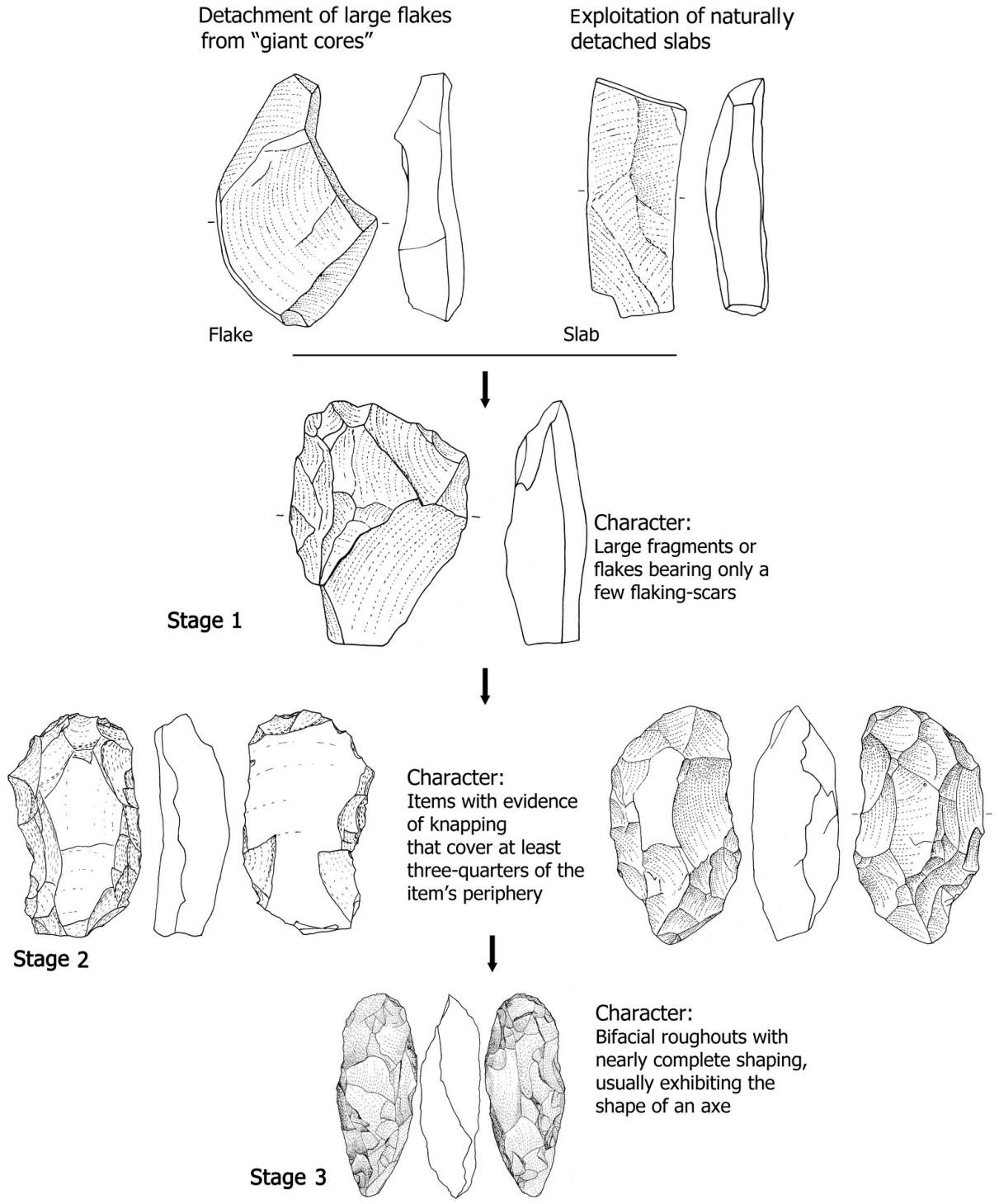

Figure 10. Stages of bifacial manufacture at the site.

5. Reconstructing Giv'at Kipod basanite bifacial reduction sequence

While a few 'giant cores' were observed on the site's surface, only one large core was found within the excavated volume. The virtual absence of 'formal cores' used for regular blank removal indicates that the entire assemblage of Giv'at Kipod reflects the manufacture of bifacial tools, and that the retrieved debitage and debris are the waste of making these core-tools. Also, the paucity of primary elements (defined by weathered surfaces predating the knapping of the item) indicates that an effort was made to extract basanite of pristine condition most suitable for knapping.

Although the methods of quarrying remain unknown, since we lack extraction surfaces, there is reason to assume that basanite slabs and boulders were easily accessible. This is suggested by the hill's northern slope, where a modern aggregate quarry is present, revealing the fragmentation of the basanite bedrock close to the current surface into both slabs and boulders. The basanite slabs often have shapes fairly close to those of bifacial rough-outs, and it is probable that a single slab would have been modified to produce a single bifacial tool. Boulders occur in various sizes; and some of the 'giant cores' documented on the surface of Locus 1 clearly reflect boulders that were subjected to some amount of modification prior to their discard. Scars, visible on their surface, indicate the production of large flakes that could have served as blanks for shaping bifacial tools. Without refitting we could only draw general differences between the extent of using slabs or boulders, in which the paucity of cores suggests that bifacial tools were primarily made on slabs.

In general, the flakes removed during bifacial knapping vary according to the stage of manufacture. Earlier stages involve the removal of relatively rough flakes, while during later stages thin flakes, often with multi scar patterns, are produced, usually described as thinning flakes (*e.g.*, Andrefsky 2005: 123-124). The number of flakes with modified (faceted) platforms is expected to increase with the progression of the reduction sequence, since the latter would be detached from a well-defined bifacial ridge. While the use of basanite might cause a bias towards thicker flakes, the paucity of clear thinning flakes might also be affected by the nature of the raw material in which delicate thin blanks often broke after knapping. In fact, among the chunks and chips, flat basanite fragments that may be broken thinning flakes are common.

Discard was apparently affected by various factors, including preform breakage, which is well-represented. The few items ascribed to 'stage III' usually have an elongated shape and lenticular section, indicating that the production was primarily focused on axes.

No features relating to the polishing of the bifacials such as grooved marks on stone surfaces were noted at the site or its vicinity. This, together with the fact that smoothed and polished bifacials commonly recovered from Neolithic settlements (*e.g.*, Dorrell 1983; Samzun 1994; Gopher 1997; Garfinkel & Dag 2006; Rosenberg & Gopher 2010; Rosenberg 2011; in press) were not identified, suggests that the final stages of the bifacial tool production were carried out elsewhere, possibly at habitation sites, as known from the ethnographic record (*e.g.*, Pétrequin & Pétrequin 1993; Barkai 2005: 176).

6. Discussion

In the Levant, bifacials made on non-flint raw materials (including basanite), were often entirely or partly polished, which together with their specific selection of raw material suggests greater symbolic content compared with flint bifacials (Rosen 1997: 93-97). Polish is certainly found on many of the south Levantine flint bifacials as well, but is typically limited to the active edge (Barkai 2005). Furthermore, while use-wear is common on flint bifacials, it is reported to be missing or rare on bifacials made of other raw materials (Yerkes *et al.* 2003).

The specific characteristics of raw material procurement vary across societies, but based on earlier studies, we suggest that it can be grouped into three general modes:

1. Raw material procurement is an undifferentiated component of general patterns of resource exploitation throughout the landscape. This mode is often embedded within a larger framework of mobility patterns (*e.g.*, Binford 1979; Brantingham 2003).

2. Raw material procurement is part of a specialized production where the knappers occupy the sources for relatively long time spans. This pattern is more common among agricultural and urban societies, in which trade or exchange constitute important economic vehicles (*e.g.*, Costin 1991; Rosen 1997; Shimelmitz 2009; Barzilai 2011; Ebeling & Rosenberg 2016).

3. Raw material locality is perceived as a highly special point in the landscape and visiting these localities is treated as the focus of the event (*e.g.*, Gould & Saggers 1985; Ross *et al*. 2003; Brumm 2010).

While the two former modes are reflected in numerous archaeological studies, the latter mode is less familiar in archaeological contexts. We argue that the site of Giv'at Kipod represents this third mode of raw material procurement and demonstrate it through several aspects pertaining to the site and its particular characteristics:

6.1. The uniqueness of Giv'at Kipod in terms of the extraction of basanite for the making of bifacials

Currently, Giv'at Kipod is the only known quarry and production site for basaltic bifacial tools in the southern Levant, although a recent geochemical study showed that other locals also served this purpose (Gluhak & Rosenberg 2013; Rosenberg and Gluhak 2015). Similar sites, exploiting non-flint resources, are also rare and include three larnite quarry and bifacial production sites in the Negev of Israel (Vardi 2015), and others, much northern sites in Turkey, Thrace (*e.g.*, Özbek 2000, Özbek & Erol 2001). On the other hand, quarry and production sites with flint bifacial manufacture are common in the southern Levant (*e.g.*, Ronen and Davis 1970; Barkai 2005; Schyle 2007; Shimelmitz & Mendel 2008; Rosenberg *et al.* 2009).

6.2. Giv'at Kipod as a production centre for basanite bifacials

The large amount of rough-outs at Giv'at Kipod and the relative paucity of basanite bifacial tools in the Levantine sites (Rosenberg *et al.* 2008), implies that production at Giv'at Kipod was sufficient to produce bifacial tools for a large number of communities. Furthermore, a provenance study recently showed that the site operated for several millennia, from the PPNA through the period of the Wadi Rabah culture (Gluhak & Rosenberg 2013). Nevertheless, the distribution range of Giv'at Kipod bifacials was limited (Rosenberg & Gluhak 2015). This, in turn, suggests that the significance of producing basanite bifacials at Giv'at Kipod crossed chronological and cultural boundaries yet had a limited geographic impact. Throughout this time frame, basanite bifacials remained marginal in quantity in relation to bifacials made of flint, thus keeping their unique character within the assemblages of the southern Levant.

The waste found at the site indicates that the production focused on achieving only the general shape of the bifacial tools and that final shaping, by abrading and polishing was conducted elsewhere. The amount of production waste is extensive (*e.g.*, our limited examination of ca. 2.5 m^3 resulted in more than two tons of knapped basanite with 116 rejected rough-outs) and thus we assume that hundreds if not thousands of bifacials were made at the site.

6.3. The unique focus of production in Giv'at Kipod on a single product

Our study of Giv'at Kipod demonstrates extensive exploitation of basanite, all of which was directed to the production of bifacial tools, mainly axes. This focus on the production of a single product, bifacials in this case, is a remarkable feature that distinguishes Giv'at Kipod from many other contemporary workshop sites.

Quarrying and knapping at raw material sources appear in the Levant already from the Lower Palaeolithic (*e.g.*, Barkai *et al*. 2006; Barkai & Gopher 2009; Ekshtain *et al*. 2012) and continue into historical periods (Shimelmitz *et al.* 2000; Rosen & Schneider 2001; Rosenberg & Nadel 2009; Rosenberg *et al*. 2011). Alongside production waste, other items are also found in these sites, indicating additional activities other than tool manufacture. Although the Palaeolithic workshop sites probably represent both the extraction of raw material in general and the making of a variety of tools that might aimed to be transported elsewhere, we find many non-formal tools such as denticulates, notches and retouched items which probably relate to expedient activities conducted on site (*e.g.*, Barkai *et al*. 2006; Rosenberg *et al*. 2009; Nadel *et al*. 2011). In the case of the Neolithic, even in sites where the specialized production focused on the manufacture of a single type of items such as bifacials, a variety of tool types were found as well (*e.g.*, Rosenberg *et al*. 2009).

The appearance of a variety of tools within most workshop sites is not surprising and in fact is even expected as reflecting the scheduling of raw material procurement within a larger set of activities performed within the landscape. This is precisely what makes Giv'at Kipod so special (although the recent larnite sites from the Negev may represent a similar phenomenon; Vardi 2015). Our volume of excavation is no different from that excavated at other workshop sites in Israel. Furthermore, in most cases the archaeological investigation is based only on survey or systematic collection (*e.g.*, Barkai & Gopher 2009; Rosenberg *et al.* 2009; Gopher & Barkai 2011; Nadel *et al*. 2011). The tools in these workshops sites can appear in high frequencies although they are usually characterized as expedient or ad-hoc in character (Barkai & Gopher 2009: 178; Gopher & Barkai 2011: 218).

6.4. Does Giv'at Kipod reflect craft specialization?

The role of craft specialization in the formation of complex societies has long been debated (*e.g.*, Costin 1991; Schortman & Urban 2004; Vaughn 2006) and the increased specializations in the Levant during the Neolithic period were the subject of several studies in the last two decades (*e.g.*, Quintero & Wilke 1995; Barzilai 2011). It is thus of importance to examine whether the manufacture of bifacials at Giv'at Kipod was part of this development or whether it is the result of a different mode of behaviour. Various definitions were offered for craft specialization, most of which relate to societies with a more complex structure than that of the Levantine Neolithic. Although the presence of part time specialization is well acknowledged, the focus is on the more permanent and institutionalized cases (*e.g.*, Brumfiel & Earle 1987; Clark & Parry 1990; Costin 1991).

We prefer to follow the definition used by Cross (1993:65) in his study of non-stratified societies where he defined specialization "… as a situation in which a relatively large portion of the total production of a given item or class of items is generated by a small segment of the population". Costin (1991) offered various characteristics for examining the presence and character of specialization. In reference to our particular context, our assumption is that if the production was specialized two elements should appear: standardization and an inclusion of waste of "domestic" character within the site. Standardization is expected to appear due to the routine manufacture of the specialists, their high familiarity with the raw material they work with (its advantages and pitfalls) and by gaining high level of skill from their repeated work (Costin 1991). Typical "domestic" waste is expected to appear in early specialization contexts

as this was usually engaged within the domestic sphere or its activities (*e.g.*, Hartenberger *et al*. 2000).

Although standardization is usually examined through the characteristics of the end-products, which are altogether missing from the site, it can also be appreciated through an observation of the rejected items and debitage. In many of the bifacial workshops of the southern Levant, rejects representing production failures in a relatively advanced stage of production (comparable to our Stage III) exhibiting a clear shape of a bifacial tool with lenticular section are common (*e.g.*, Schyle 2007; Shimelmitz & Mendel 2008). At Giv'at Kipod on the other hand, rough-outs that approach the final products are few and most were discarded during relatively early phase of their production. These are highly variable in characteristics and do not show the exceptional skill expected of craft specialists.

The waste accumulation of lithic workshops from the Levant is usually characterized by a variety of additional materials, including not only a range of tool types but also general "domestic" waste such as bones, ceramics, broken ground stone implements *etc*. (*e.g.*, Gilead *et al*. 2004). None of these were found however at Giv'at Kipod. The lack of any evidence for domestic activity or standardization underscores the interpretation that Giv'at Kipod was not used by a small group of specialized knappers that lived at, or frequently visited the site.

6.5. Towards an 'Alyawara day' model of raw material extraction

Our study clearly indicates that Giv'at Kipod was a quarry and production centre that specifically served for the manufacture of basanite bifacials over a period of several millennia, in the course of which its products were distributed to several sites in the region. At present, no mechanism of specialized production was identified at the site. The rarity of other finds suggests that the site was perceived as a special location in the landscape - one that is used exclusively for the production of specific artefact type from a specific type of rock. This is mirrored in some anthropological reports as well, which dealt with raw material extraction (*e.g.*, Gould & Saggers 1985; Ross *et al*. 2003; Brumm 2010). For example, Gould & Saggers (1985) described specific trips for the procurement of raw material which were made by men only. These trips were not made to obtain raw material in general, but rather a specific type of raw material. Gould & Saggers (1985: 122) stated that "…all male groups making such trips, often over hundreds of kilometres from their home areas, to introduce novices to sacred landmarks and the myths associated with them". In Papua, New Guinea, before going to the quarry a fast was conducted that lasted for part of the quarrying time as well (Rhoads & Mackenzie 1991). These behavioural patterns are in complete difference to the regular everyday raw material procurement. For instance, Binford (1979: 259) in his study of the Nunamiut argued that "raw materials used in the manufacture of implements are normally obtained incidentally to the execution of basic subsistence tasks".

It seems these two sets of behaviours can be seen in the procurement of flint in general versus the procurement of basanite in Giv'at Kipod. While the former according to the record of the Levant was commonly conducted not as an exclusive single task but rather as a task comingled with other sets of tasks, the latter lack any other evidence of other task engaged with it. While the anthropological record is rich with cases describing the rituals and habits relating to the visit and use of raw material sources (*e.g.*, Binford & O'Connell 1984; Pétrequin *et al*. 1998), by most current archaeological means, most would be hard to track.

The unique case of Giv'at Kipod, as described here, seems to provide a novel perspective for the possibility of observing this type of behaviour in the archaeological record. Following the seminal study of Binford & O'Connell (1984), we suggest that this type of quarry and production site, demonstrating a very limited set of activities relating to a specific raw material and tool type with the almost absence of waste of any other activity, indicates a

unique social context in which knapping occurred. For this type of organization of production we suggest the framework of Alyawara day model of raw material extraction. We are fully aware that in their paper “An Alyawara Day: The stone quarry”, Binford & O'Connell (1984) described a journey to the quarry which was set by the elders and only mimics the “old ways” of life. As such, it is not representative of an original set of events as normally occurred before modern colonization of Australia. Nevertheless, as many others, we find this work of prime importance in the study of quarry and raw material exploitation and thus selectively choose to use it as a title for the suggested model, despite the obvious difficulties steaming from the analogy.

We thus suggest that such a model which can aid in identifying similar sites should be based on the five themes explored above in the case of Giv’at Kipod (these however are just general lines that must be further perused by adding more examples of this type of behaviour):

1) The site consists of a raw material that constitutes a unique choice among a variety of available alternatives; the special importance of the raw material will be witnessed in the characteristics and life-history of the end-products.

2) The end-products of the quarry sites should not be found just in a single site, but should be found in a number of sites.

3) The manufacturing process is geared towards a very particular type of end-product(s), in contrast to other outcrops where a large variety of tools were made.

4) No other activity other than the manufacture of the designated end-products should be evidenced at the site.

5) The activity does not reflect craft specialization, but fits the character of waste produced by a notable number of individuals visiting the site.

Giv’at Kipod, a rare occurrence in the Levantine archaeological landscape, provides a valuable and uncommon addition to our understanding of Neolithic-Chalcolithic modes of production and a venue to pursue new directions in the study of raw material procurement strategies. We demonstrated that its different character is revealed when compared with the archaeological record from other quarry and workshop sites throughout the Levant. Interestingly, this very particular mode of behaviour at the outcrop of Giv’at Kipod seems to have lasted for millennia, a point that further supports the notion that the site and its products had an exceptional cultural significance in the late prehistory of the southern Levant.

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