

CHAPTER 6

THE GROUND STONE OBJECTS

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Introduction

A number of groundstone studies have been published lately in the archaeological literature of the southern Levant. Perhaps the two most comprehensive and useful of these are Erella Hover's account of the stone utensils from the City of David (Hovers 1996) and Ianir Milevski's study of the stone objects from Manahat (Milevski 1998). Other recent studies, such as that of Yahalom-Mack (2001) on Tel Batash and Ebeling (2007) on Tel Mor, use similar formats and terminology. The criteria used here follow what is now the normative descriptive procedure. We will adopt the format and nomenclature of Milevski's study as it deals with an assemblage that is similar to that of Yesodot. This article deals mostly with groundstone tools but also describes a few natural stone objects that appear to have been collected for some intrinsic value.

Materials

Choice of stone type appears to have been determined largely by an objects' intended utilization (see Table 6.2). At Yesodot millstones (also called grinding stones, querns or slabs) and stone bowls are made predominantly of highly vesicular basalt—the exception being one beach rock example—and bowls of denser, less vesicular basalt. Handstones, rings, mortars and pounders are most often made of carbonate stone—limestone, flint or hard chalk—but sometimes of fine-grained basalt. One rubbing stone made of pumice was recorded. This demarcation of materials *vis à vis* function is more conspicuous at Yesodot than it is at most other sites of the Bronze and Iron Ages.

Stone samples were examined visually with a magnifying glass (x14) and tested with diluted (1:6) hydrochloric acid (HCl). Hardness was determined

by comparison with other minerals according to the Mohs hardness scale. Two samples (Table 6.2:11, 33) were examined by Scanning Electron Microscope (S.E.M. Jeol. JSM-840) and by energy dispersive spectrometer (E.D.S., Oxford ISIS).

Lower millstones (N=5): All the lower millstones are fragments. They are generally convex and flat in section (the flat side facing up). They are almost always fashioned from vesicular basalt, with the exception of one piece (Table 6.2:11) which has a rounded-flat section and an off-white color. EDS testing revealed that this item is of beach rock (comprised of quartz with a strong presence of lime and a few fossils [probably gastropods]). This type of rock is native to coastal regions, and not indigenous to the Yesodot region.

Upper millstones (N=6): These too are all fragments, although in some cases (Table 6.2:3, 4) the fragment comprises more than half of the original object. They also tend to be convex and flat (with the flat side facing down to meet the flat face of the lower millstone, while the convex end was grasped by the grinder). All of the upper millstones were made of vesicular basalt.

Handstones/polishers (N=7): This category includes—but is not confined to—items which have often been called 'hammerstones'. Handstones are defined as those best utilized with one hand (fist-size stones), leaving the other hand free. While they appear best adapted to rubbing and grinding with a circular motion, their different forms suggest variant purposes and motor patterns. The smaller cuboid handstones seem best suited to rubbing and grinding over a smaller, more focused area, where great force is not required. Cuboid stones may also have been scale weights (Eran 1996),



Fig. 6.1. Selected stone tools.

No.	Tool type	Field no.	Locus
1.	Stone ring	3091/2	321
2.	Pounder	1014/1	114
3.	Bowl	3365/1	surface
4.	Bowl	3326/1	410
5.	Handstone/polisher	1032/1	118
6.	Handstone/polisher	1025/1	127
7.	Lower millstone	1063	131
8.	Upper millstone	3368/1	surface
9.	Upper millstone	3366/1	?
10.	Lower millstone	1070/1	150
11.	Upper millstone	1008/1	108
12.	Weight?	3183/8	350
13.	Handstone/polisher	3369/1	?
14.	Handstone/polisher	3073/2	?
15.	Lid	1020/1	133
16.	Handstone/polisher	1057/1	139

but this subject is controversial (e.g. Kletter 2006) and the present assemblage too small to be able to support one interpretation over another. Larger stones with a rounded-to-flat or plano-convex profile seem more suited to rubbing and grinding over a larger area where, again, great force is not required.

Handstones can be made of different minerals, with softer minerals such as chalk having a more limited utility—perhaps as a laundering tool for removing stains, for example. One handstone/polisher (Table 6.2:29) is a flat piece of pumice with rounded edges which would have been used for delicate rubbing (the smoothing of soft wood, hides or skin, for example).

Pounder (N=1): Pounders are invariably made of dense, heavy rock (flint in this case) and display the scars of pounding (as opposed to true grinding or rubbing stones). The scarring suggests the pounding of, or against another, heavy, resistant material (stone is most likely). As to the function of pounders, one possibility is the making of plaster from chalk.

Mortar (N=1): Only one mortar was found at the site (*in situ*; L345, field no. 3227/8 in Building B2; see Fig. 2.9), made of limestone. This mortar was broken in half. Its base had worn down to eventual perforation, prior to breakage. Perhaps, once perforated it was used to hold a pole in place. Mortars, being deep vessels, typically form a pair with pestles, which are elongated and have thicker working ends and more narrow grasping ends. Pounders and handstones are too small to be used effectively with mortars. Since no pestles were recovered in our excavation we might tentatively suggest that wooden pestles were more the norm.

Bowls (N= 3): All three recovered stone bowl fragments are made of dense—though still slightly vesicular—basalt. Two fragments are of rims—one simple and tapered, and one beveled obliquely inward. The third fragment is of a pronounced ring base with an inner concavity; it is likely that the rims belonged to vessels with similar bases. Their high relative density and weight suggests that stone bowls were mostly stationary. Moreover, the selection of dense but slightly vesicular basalt together with the bowls' smoothed interiors, suggests that they may have been receptacles intended for materials subjected to moderate grinding—perhaps spices and foods such as grain, chickpeas, dates or olives for example (bowls with interior smoothing have been found at various sites, such as the City of David (Jerusalem; Hovers 1996: 177) and Tel Michal (Singer-Avitz 1989: 351-352).

Disks/Lids (N=2): Both lids were fashioned from limestone and are perfectly circular. One is flat on both faces and the other has one convex side. This is a fairly uncommon occurrence; lids are more often made of re-used pottery bases (cf. Chapter 3). The stone disks may also be weights.

Pierced stones (N=2): This group is composed of artifacts of unknown function. Two such objects were recorded:

1. A suspension weight (?).
2. A large limestone ring. This object is fairly heavy (1.625kg) and weight was clearly integral to

its function. One hypothesis is that such rings were digging stick weights (Amiran and Ilan 1992: 42; Fig. 25). But they may also have held down fabric, leather awnings or something else.

Pavement slab (N=1): This slab of white limestone was found together with other stone slabs as part of a pavement. This piece has been singled out because it is particularly flat (as a result of natural processes).

Natural stones (N=3): These are unusual natural stones which are not indigenous to the site, but rather were brought from other regions. One example is of crystalline quartz (Table 6.2:34). This stone has an amorphous shape and a transparent white color. Two other unusual stones (Table 6.2:32, 33) have amorphous shapes and a light gray/green color. An EDS test conducted on one of the two (Table 6.2:33; see introduction above) revealed that these are fine-grained magmatic rocks, probably of a basaltic origin. The function of these stones is not clear, but they can be considered additional evidence for interaction with distant regions.

Summary

The limited size of the ground stone assemblage of Yesodot does not permit far-reaching conclusions. Due to their durability, ground stone tools have a long use-life and are not prone to changes in style. For this reason it is almost impossible to make chronological observations. In any event, few complete or intact stone artifacts were found. Many of the 34 objects were in secondary use—in floors, walls and installations. This also might be an indication that rather than suffering permanent abandonment without subsequent disturbance, the site periodically fell into disuse or was scavenged.

The presence of grinding artifacts such as the upper and lower millstones, bowls and polishers indicates that a range of processing activities was practiced (mainly food-related, but certainly not limited to this). Some of the raw materials (mainly the vesicular basalt) used for making the stone artifacts are not native to the vicinity of Yesodot,

and therefore reflect movement of people and goods, perhaps through trade with workshops,

such as those in the Jordan Valley, Galilee and the Golan Heights.

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Table 6.2. Inventory of stone tools. Continuation on next page.

No.	Type	Field no.	Locus	Raw Material	Shape	Section	Length	Width	Height	Preservation	Comments
1.	Upper millstone	1070/3	150	Basalt	Convex	Convex-flat		10.5	4.1	Fragmentary	
2.	Upper millstone	1071/1	139	Basalt	Convex	Convex-flat			3.7	Fragmentary	
3.	Upper millstone	1075/1	135	Basalt	Convex	Convex-flat		9.2	4.8	Fragmentary	
4.	Upper millstone	3003/1	301	Basalt	Convex	Convex-flat		10.5	3.8	Fragmentary	
5.	Upper millstone	3366/1	Surf.	Basalt	Convex	Convex-flat		10.5	3.5	Fragmentary	
6.	Upper millstone	3368/1	Surf.	Basalt	Convex	Convex-flat	11.8	7.5	6.2	Fragmentary	
7.	Lower millstone	1008/1	108	Basalt	Straight	Convex-flat			3.4	Fragmentary	
8.	Lower millstone	1048/3	133	Basalt	Straight	Convex-flat				Fragmentary	
9.	Lower millstone	1075/2	135	Basalt	Straight	Convex-flat				Fragmentary	
10.	Lower millstone	3013/1	314	Basalt	Straight	Convex-flat			4.3	Fragmentary	
11.	Lower millstone	1025/1	127	Off-white beach rock	Rounded	Rounded-flat	21.5	17.2	2.5	Complete	Comprised of quartz grains with limestone cement and few fossil fragments; burnt.
12.	Handstone/polisher	1032/1	118	Dark gray basalt	Cuboid	Cuboid	-----	-----	3.5	Complete	Fine-grained, 0.5-3.0mm; phenocryst.
13.	Handstone/polisher	1047/2	131	Hard white chalk	Round	Plano-convex	4.5	4	3	Complete	
14.	Handstone/polisher	1057/1	139	Hard light yellow chalk	Elongated	Plano-convex	8	4	2.5	Complete	
15.	Hand stone	1070/2	150	?	Elliptical	Convex	6	4.5	3.5	Complete	
16.	Handstone/polisher	1090/1	133	Brown and white dolomite	Round	Plano-convex	7	6.5	2		
17.	Handstone/polisher	3013/2	314	Gray-white beach rock	Cuboid	Cuboid	-----	-----	3.9	Complete	
18.	Pounder	1014/1	114	Gray-white flint (?)	Globular	Globular	7	6	7	Complete	
19.	Bowl	3091/1	321	Basalt	Concave	-----	-----	-----	2.8	Fragmentary	
20.	Bowl	3326	410	Basalt	Concave	-----	-----	-----	-----	Fragmentary	
21.	Bowl	3365/1	Surf.	Basalt	Concave	-----	-----	-----	3	Fragmentary	

No.	Type	Field no.	Locus	Raw Material	Shape	Section	Length	Width	Height	Preservation	Comments
22.	Mortar	3227/9	346	Hard off-white dolomite	Concave	-----	Inner 16.1 outer 25.5	Inner 19 outer 21.3	12.4	Broken	Perforated; dense, fine-grained (fizzes in dilute HCl).
23.	Lid	1070/1	150	Gray limestone	Round	Flat	4.5	4.5	0.5	Complete	
24.	Lid	3367	Surf.	Whitish-yellow limestone	Round	Flat -rounded	7	7	0.5	Complete	Medium grains of crystalline calcite.
25.	Weight	3183/9	350	Off-white chalk	Elliptical	Rounded-flat	-----	5.5	1.3	Broken	
26.	Weight?	Surf.	?	Gray, hard, brecciated flint	Cuboid	Cuboid	4	4	4	Complete	Very few signs of use, except for one very smooth surface.
27.	Large stone ring	3091/2	321	Limestone; cream-buff	Round	Flat-rounded	11.5	11	4.5	Complete	Dense and fine-grained. Digging stick weight?
28.	Pavement slab	1080/1	150	White limestone	Trapezoidal	Flat	23	13-19	2.1	Complete	Soft limestone, fizzes; Givat Shaul Formation type.
29.	Handstone/polisher	1063/2	131	Pumice	-----	-----	-----	-----	-----	Fragmentary	
30.	Natural stone/polisher?	1034/1	114	Light gray dolomite	Elongated	Rounded-flat	-----	-----	-----	Complete	
31.	Natural stone	1084/1	131	Brown flint	Amorphous	Amorphous	-----	-----	-----	Complete	
32.	Natural stone	1069/2	141	Light gray and green basalt	Amorphous	Amorphous	12.5	9	-----	Complete	Magmatic rock; not weathered and very fine grained.
33.	Natural stone	1073/1	139	Light gray and green basalt	Amorphous	Amorphous	15	14	11	Broken	Magmatic rock; not weathered and very fine grained.
34.	Natural stone	3021/3	316	Quartz	Amorphous	Amorphous	/	/	/	Complete	Transparent white, crystalline. 3-10mm. Geode.