A Renewed Reading of Hebrew Ostraca from Cave A-2 at Ramat Beit Shemesh (*Naḥal Yarmut*), *Based on Multispectral Imaging*

Anat Mendel-Geberovich
Tel Aviv University
anat.mendel@mail.huji.ac.il

Shira Faigenbaum-Golovin
Tel Aviv University
shirafaigen@gmail.com

Arie Shaus
Tel Aviv University
ashaus@post.tau.ac.il

Barak Sober
Tel Aviv University
baraksov@post.tau.ac.il

Michael Cordonsky
Tel Aviv University
mcordi@tauphy.tau.ac.il

Eli Piasetzky
Tel Aviv University
eip@tauhpy.tau.ac.il

Israel Finkelstein
Tel Aviv University
fink2@post.tau.ac.il

Ianir Milevski
Israel Antiquities Authority
ianirmilevski@gmail.com

Abstract

Three Hebrew ostraca, found near Khirbet Zanuʼ (Ḥorvat Zanoaḥ) and published by Milevski and Naveh in 2005, were re-imaged using a high-end multispectral imaging technique. The re-imaging yielded dozens of changed or added characters and resulted in renewed, larger and improved readings, hereby published. In addition, we interpret the texts of the ostraca and place them in the context of the economy and administration of Judah in the seventh century BCE.

Keywords

Three Hebrew ostraca were found in Cave A-2 at Site 94/21, located approximately 400 m southwest of Khirbet Zanuʼ (Ḥorvat Zanoaḥ) (Milevski 1998) in the Shephelah.[1] They were read and published by Joseph Naveh (Milevski and Naveh 2005) and dated to the Iron Age IIC (end of the seventh-beginning of the sixth century BCE), according to the pottery assemblage unearthed in the cave. The paleography of the ostraca and the personal names which appear in them are in agreement with this dating (Milevski and Naveh 2005: 22). We recently re-imaged them with multispectral imaging equipment (see below). The new images revealed new data that deserve the renewed publication presented in this article.

The excavators understood the cave to be part of an agricultural complex which included a winepress and other installations. Many storage jars, most of them of the "rosette" type (including one "rosette" stamped handle), as well as jugs, bowls, kraters, cooking pots, holemouth jars, a lamp and a limestone mortar, were uncovered in the cave (Milevski and Naveh 2005: 19-20).

The texts of the ostraca (Reg. Nos. 123-0/1, 1230/2 and 1242/1) deal with payments, which may be understood to be in the framework of either state taxation or private exchange relations. Naveh interpreted them as accounting documents, connected to a local administration of fields and/or their produce. Indeed, there are many signs and symbols, some of them seen here for the first

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1 For the identification of the site with one of the חצרים (hamlets) in the periphery of biblical Zanoaḥ (Josh 15:34), see Milevski and Naveh 2005: 24; Milevski forthcoming.

time thanks to the new imaging technique, that are known from other Hebrew administrative documents. Archaeological indications for wine and olive oil production in and around the site may be connected to the agricultural activity referred to in the inscriptions.

Naveh mentioned that the word שדה (field), in Ostracon 1, "does not specify the kind of activity performed in it, although it was probably used for cereal production. Apparently, the ostraca were connected with the activity in the fields around the complex" (Milevski and Naveh 2005: 24). Indeed, both cereals and liquid products—wine and oil—are very well attested in Hebrew epigraphy throughout the first millennium BCE; suffice it to mention the well-known corpora from Samaria and Arad (Reisner, Fischer and Lyon 1924; Aharoni 1981). All these types of goods are connected to taxation in kind and redistribution in the name of the state (Garfinkel and Mendel-Geberovich 2016). However, in recent years there has been a growing number of works that look at these ancient inscriptions as originating in exchange between individuals not related to the kingdom's apparatus (Na'aman 2012; Mendel 2015: 40-41; 48; 329). Trade or exchange may also have been conducted by independent merchants or by the king's agents (Na'aman 2012: 97).

1   Method: Multispectral Imaging

We have recently shown that multispectral imaging techniques improve the legibility of ostraca (the Ophel Ostracon, Faigenbaum-Golovin *et al.* 2015; ostraca from Qubur el-Walaydah, Faigenbaum *et al.* 2014; Tel Malḥata, Faigenbaum *et al.* 2015; Ḥorvat ʿUza and Ḥorvat Radum, Sober *et al.* 2014; Arad Ostracon no. 16, Faigenbaum-Golovin *et al.* 2017 and Mendel-Geberovich *et al.* 2017). Following our established procedure (Faigenbaum *et al.* 2012), we produced images of the three ostraca from Naḥal Yarmut. Based on the results, below we offer additions and alterations to Naveh's reading.

Our previous study (Faigenbaum *et al.* 2012) demonstrated that: (a) the optimal imaging wavelength for ink-inscribed Iron Age ostraca lies between 550 nm and 950 nm; (b) ten different bandpass filters are sufficient for capturing the most favorable image. Accordingly, we used a standard digital Canon SLR 450D camera that is sensitive to the visual spectrum (*i.e.*, 400-700 nm), with its internal IR cut filter removed and replaced with transparent glass, in order to enhance the camera sensitivity in IR wavelengths (*i.e.*, up to 1000 nm). MP-E 65mm f/2.8 1-5× Macro Lenses were used to achieve better zoomed-in

images in specific cases, allowing for a capture of approximately three characters (the zoomed-in MS images assisted us greatly, *e.g.* in Yarmut 12-1786). Upon imaging, the spectrum was sliced into ten channels utilizing additional external bandpass filters. Using this system, we produced spectral cubes of ten images for each side of the ostracon. We selected the best images based on the Potential Contrast method (Faigenbaum *et al.* 2012, Shaus *et al.* 2017). The best image was chosen for each imaged area (be it a whole ostracon or its zoomed-in parts). After choosing the best image, its legibility was enhanced via contrast and brightness manipulations performed utilizing the freely available ImageJ and IrfanView software applications.

2   Epigraphic Analysis

2.1   *Ostracon 1 (Reg. No. 123-0/1)*

Ostracon 1 was found together with several body sherds that apparently belonged to the same jar. Unfortunately, the other sherds could not be located during research for this article. The original text was longer than what we are left with today: MS imaging shows that at least one additional line (marked here "line 0", so as not to disarrange the original publication's line numbering) existed at the top of the sherd, and an additional line is present at the end (line 7). Interestingly then, the ostracon is broken only at the upper and lower edges, while the right and left edges do not seem broken.

The color image and one of the MS favorable images in the wavelength of 890 nm (the latter after contrast enhancement) are shown in Figure 1, accompanied by a manually drawn facsimile.

Joseph Naveh, in the first publication, states that many characters are illegible. With MS imaging, wavelength 890, the legibility of the inscription is improved. Including the two additional lines, it improves the legibility of 29 letters and signs.

The text enumerates two fields belonging to two persons who were possibly brothers. It also contains other pieces of information, written in signs and numerals. The persons mentioned may have been the owners of the fields who paid taxes in the form of produce from their harvests (cf. Pardee 1999). Otherwise, the text may be a registration of fields described according to their capacity, indicated by amounts: "a field that yields X amount of grain" or "field for whose sowing one [amount] is needed" (see below; Milevski and Naveh 2005: 23).
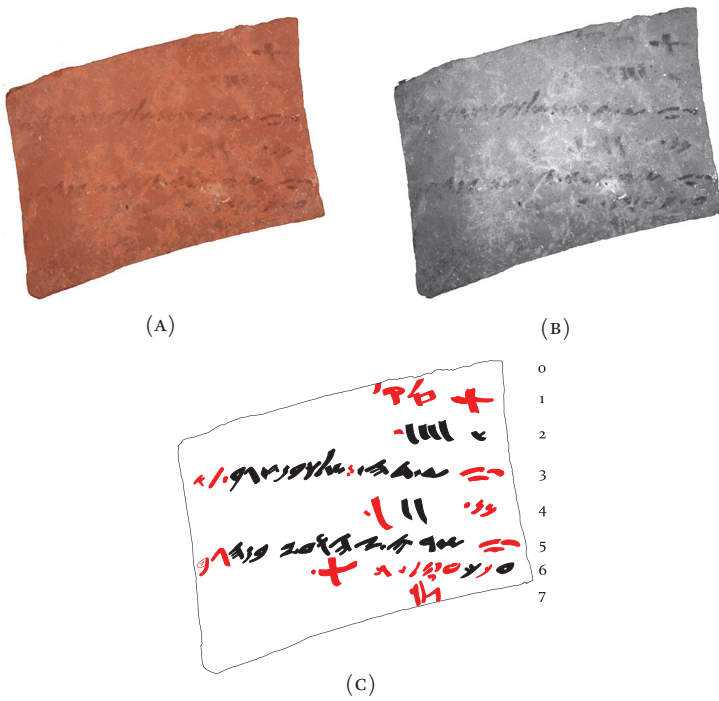
(A) (B)

(C)

FIGURE 1 **Ostracon 1.** (A) Color (RGB) image; (B) MS image corresponding to 890 nm;
Photography by Michael Cordonsky
PHOTO COURTESY OF THE ISRAEL ANTIQUITIES AUTHORITY; (C) FACSIMILE.
IN RED: OUR ALTERATIONS AND ADDITIONS WITH RESPECT TO THE
ORIGINAL PUBLICATION (MILEVSKI AND NAVEH 2005). DRAWING BY
ANAT MENDEL-GEBEROVICH

Reading:

0.   [נ\מ\כ]
1.   חלק
2.   4.
3.   א/ .שדה. שלך בן חגב.
4.   מן. 3.
5.   שדה. יהועז בן הגב
6.   ענ?כ? ע/- הו [   ]
7.   [   ] 12

0.   [   ] *k\m\n*
1.   *Xar* plot
2.   *kor\ḥmr* 4
3.   {3-notation} (of) the field. $^1/_8$(?); Šalak son of Ḥagab: /first (-quality).
4.   *mn.* 3.
5.   {3-notation} (of) the field. Yeho'az son of Haga*b*
6.   '*n*k '{4-notation} /-*ʰ\ʷ Xar*.
7.   [ ] 12

Commentary:
Line 0: ink remains indicate a letter with a long downstroke such as *kaf*, *mem* or *nun*. An additional line at the bottom of the sherd (line 7) is now visible. This line is also fragmentary, an indication that this Hebrew inscription must have been longer.

Line 1: חלק

The first sign is the hieratic *Xar*—a sign attested elsewhere in Hebrew epigraphy: in Arad inscriptions no. 16 (recto: line 8; verso: line 2; see Mendel-Geberovich *et al.* 2017 with references to variant forms); 25 (line 2); 34 (right column, line 2) (Aharoni 1981), and in Kadesh Barnea Ostracon 6 (left column; see Wimmer 2008: 264). This sign represents a measure of dry commodities. It is also repeated in line 6 of our ostracon, where the reading is unfortunately vague.

חלק—this word is complete as the remains left of the *qop* belong, as mentioned above, to a letter in the preceding line, and all the lines of the text are written diagonally to the rectangular sherd. חלק is probably a Hebrew lexeme—either a noun or a verb. As a noun, parallels are known from Aramaic: on a jar inscription from Samaria (Lemaire and Mendel-Geberovich forthcoming, no. 5), translated "field", "plot", or "plantation", "grove" (cf. Eph'al and Naveh 1996: 11, 86-nos. 189, 193; Lemaire 1996: nos. 106, 135); on a papyrus from Elephantine (Papyrus P. Berol 23 000, Shunnar 1970), read by Naveh and Shaked and translated by them as "share" or "part" (Naveh and Shaked 1971: 379-380; cf. Degen 1972; Macuch 1973; for a palaeographic dating, see Golomb 1975). As a verb, חלק is attested on Aramaic boundary stones found in Armenia, translated "divided", "delimited" (see also Epha'l and Naveh 1996: 66, no. 135) but it can also mean "portion of field" (Naveh 1971; see also Porten and Yardeni 1989: 12-13, 48-51, 68-71; 1999: 36-37; for more examples, see Hoftijzer and Jongeling 1995: 378-379 (*ḥlq₃*)). Later, it is attested in a Nabataean inscription from Petra dated to the 1st century CE or slightly later (Hammond, Johnson and Jones 1986: 78, l. 2), where *pytḥlqwn* is translated "then they shall allot". In addition, this root

is attested in the dialect of Tell Deir 'Alla (Combination II, line 11) as well as in Ugaritic, Akkadian, Ethiopic, Arabic and biblical Hebrew (Isa 57:6), but with the meaning "to perish", "to be abandoned to perdition" (Hackett 1980: 67-68; Hoftijzer and van der Kooij 1976: 234; Caquot and Lemaire 1977: 205, Dahood 1981: 126; *HALOT* I: 323). This latter translation is less likely in our inscription. Finally, חלק is attested as a personal name or as an element thereof in biblical and epigraphic Hebrew: 2 חלקיהו, 26; 18:18 Kgs and more; לחלקיהו בן מאס on a bulla from Lachish, *WSS* no. 498; לעזריהו בן חלקיהו on a bulla from the City of David (Shoham 2000: 43); and as a place name in the Samaria Ostraca (Reisner, Fischer and Lyon 1924: nos. 22-27). A personal name here is less likely, in our opinion, and it is probably preferable to understand חלק in this administrative text as a noun meaning "plot of land". What then would be the meaning of חלק ⤙? Perhaps it should be compared to Naveh's understanding of the following line: "a field that yields *Xar* amount of grain" or "field for whose sowing one *Xar* of grain is needed" (see below).

Line 2: . 4 ☙

MS imaging shows that the sign ☙ occurs here only once, in line 2, and not twice as Naveh believed. Similar signs are attested in the Hebrew Ostraca of Arad (Aharoni 1981: Nos. 1, 8, 18, 22, 31, 34), in Meṣad Hashavyahu Ostracon 3, in Kadesh Barnea Ostracon 5, as well as on the Wadi Murabba'at papyrus (Milik 1961: 93-100; Naveh 1965: 68). Milik suggested that this sign stood for *seah*, whereas Aharoni interpreted it as a sign for either *kor* or *ḥomer* (so also Wimmer 2008: 254-256). Demsky (personal communication) thinks that it is a numeral for עשרון, "a tenth (part)", and offers to read it as the numeral 10 in Arad 22 and possibly also in Arad 18 (see Demsky 1972: 234). Naveh suggested that in our context this sign designate a measure of wheat or barley, *i.e.*, "fields that yielded such quantities of crops" (Naveh 2005: 23). In his words, "another, more plausible interpretation, is that the quantities of wheat or barley are the actual measurement of the fields, generally expressed as בית זרע כור/סאה. Accordingly, the translation of our text will be: "PN's field for whose sowing X *kor/seah* are needed" (Driver 1965: 30-31, no. VIII: 2, 4).

Line 3:

שדה. ⸜ שלך בן חגב. א/ ⸝

This line begins with a sign composed of 3 dashes arranged in a triangular order (⸝). The same sign is repeated in line 5 at the same position—at the beginning of the line and before "שדה." (field). While this sign is not attested

in other epigraphic Hebrew finds and its meaning remains enigmatic, we suggest that it is some kind of notation connected to the fact that our text is a list of fields. Perhaps it is parallel, in a way, to *Xar* in Line 1, and is corresponding to שדה. One may compare it to another notation in a list, though earlier, from Bet Shemesh (Tell Rumeilleh) (Grant 1930; for its date, cf. Cross 1967: 19*; Puech 1986: 175-177; Sass 1988: 64-65; Naveh 1990: 34-35; Lemaire 2012: 298). In that early list, a row of dots appears alongside the names of persons enumerated; these dots led Benjamin Sass to interpret them as notations, of what we do not know, but possibly comparable to notations of work days in contemporary Egyptian lists of workers from Thebes (Sass 1988: 65).[2] In sum, this sign may have been a notation connected to the field, maybe a measurement of its capacity or even of the number of days needed for its agricultural work.

שדה (field), apart from the Bible, appears on ostraca from the Ophel: Ostracon no. 675b (Lemaire 1978) and the Ophel Ostracon (Milik 1959: 550-553; for the updated reading and now *editio princeps*, based on multispectral imaging, see Faigenbaum-Golovin *et al.* 2015: 121-122). Its cognate is found in other Northwest Semitic epigraphies such as that of Ugarit (Pardee 1999).

The second sign in line 3, ϟ, which is here read by us for the first time, has similar (but variant) forms in Arad (inscription no. 34, left column, line 2; Aharoni 1981: 62-64), Tell Jalul Ostracon 1 (Gane 2008), and Kadesh Barnea Ostracon 5 (*verso*, right column, first and last signs; see Cohen 2007: 247-249). Its meaning is not certain; commentators like Gane suggest seeing it as a sign for *seah*, while Wimmer (2008: 267) hesitantly interprets it as the sign for the fraction $1/8$.

Next comes the full name of a person, שלך בן חגב. As Naveh noted, the element שלך is unknown in Hebrew, but is attested in Phoenician personal names (Benz 1972: 416-417). The name is followed by a slash, in turn followed by the letter *ʾaleph*. Judging from such slashes in Arad (Ostraca 10: line 3; 14: line 3; and 17: *recto*, line 3, *verso*, line 2; See Aharoni 1981; Mendel-Geberovich *et al.* 2017), it could be a unit sign. The *ʾaleph*, in our opinion, designates the quality of the grain. Though somewhat chronologically remote, we know from Roman military and civil vocabulary, as well as from rabbinic sources, about the distinction between varied qualities of bread (Amar 2011: 145-146; Stiebel 2011).[3] In the Mishna and in the Babylonian Talmud there is a discussion about the quality of different grain produce brought as offerings; the name אלפא (alpha) designates

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2   Yeivin's (1937: 187-192; 1939: 111) interpretation of the dots as numerals is unlikely.

3   A few finds testify to this distinction, *i.e.* bread stamps with Greek "alpha" or Latin "prim(us)" which probably designate premium quality. We extend our thanks to Dr. Guy Stiebel and Prof. Zohar Amar for bringing these references to our attention.

the best (first) quality: "All [offerings] must be offered from the choicest pro-
duce. And which is the choicest? Michmas and Zanoḥa rank first (אלפא), for
the quality of their fine flour" (Babylonian Talmud, Menachoth 83b). Michmas
and Zanoḥa (Zanoaḥ) are biblical place names (Ezra 2:27; Josh 15:34, 56); they
are mentioned here as the origins of the best grain that can be brought as of-
fering. Most intriguingly, Zanoḥa-Zanoaḥ is located only a half a kilometer
from the finding place of our ostraca, and this name is attested on Ostracon 3
(below). Truly, we do not possess information about the quality of Zanoaḥ's
products during First Temple times, but we may carefully interpret the *'aleph*
at the end of line 3 as a related designation, and offer the following translation:
"3 (of) the field. $^1/_8$(?); Šalak son of Ḥagab: /first (-quality)".

Line 4:

3. מן.

Naveh thought there was another ☙ sign at the beginning of this line, but MS
imaging provides a different reading, מן—probably a designation of a payment
unit (Akkad. *manu*; Ezek. 45:12).

Line 5:

☙ שדה .יהועז בן הגב

Naveh did not notice the presence of the first sign (☙), which, as men-
tioned above, appears also in line 3 before ".שדה". As mentioned, this similarity
between lines 3 and 5 is not accidental—on the contrary, it constitutes a par-
allelism that is typical of lists (Mendel 2015: 24-33), to the extent that the text
forms a matrix. Furthermore, according to our reading, the two enumerated
persons probably share the same patronymic, חגב, hence they could be broth-
ers between whom the field was divided. יהועז is attested in Hebrew epigraph-
ic finds: in Ḥorvat 'Uza inscription 18 (Beit-Arieh 2007: 150-152) and in Arad
inscription 31 (Aharoni 1981: 56-59); חגב is attested in Hebrew epigraphic finds
such as Lachish 1 (Torczyner 1938: 30-31), Ḥorvat 'Uza Ostracon 21 (Beit Arieh
2007: 157-158) and on a stamp seal from Jerusalem (Ornan *et al.* 2008: 118). Due
to the great graphic similarity between *he* and *ḥet*, we believe that the spelling
הגב is the author's mistake, and that he probably meant the spelling חגב.

Line 6:
This line contains some letters and partly intelligible signs. The *Xar* sign, which
appears in line 1, is repeated at its end. The sign ⚡, which appears to consist
of two sets of parallel signs, could also be a hitherto unattested notation mark,

similar to ⌒⌒. An anonymous reviewer suggested to read בזנח, with hesita-
tion, at the center of the line. This reading is possible, however, the multispec-
tral imaging does not provide sufficient evidence for a definitive conclusion on
this issue.

Line 7:
The line, containing unidentifiable signs, was not noticed in the first
publication.

All told, this ostracon bears an administrative text in the form of a list of
fields. Two ostraca from the Ophel of the 7th-6th centuries contain the
lexeme שדה: Ostracon no. 675b (Lemaire 1978) and the Ophel Ostracon
(Faigenbaum-Golovin *et al.* 2015). Some lists from Ugarit mention fields
(*KTU* 4.280) and field owners (RS 15.116 and RS 19.016, See Pardee 1999). The
list is, in all probability, descriptive and retrospective. It possibly records some
economic situation wherein the two sons of Ḥagab paid taxes in kind in the
form of produce from their field—wheat, barley, wine, or olive oil (Milevski
and Naveh 2005: 25, n. 5). Alternatively, the text may be a registration of fields
described according to their capacity, indicated by amounts.

As in all ancient lists, the exact signification of the different signs, the iden-
tity of the named persons, and the entire purpose of this list is undisclosed.
It is in fact a recording of a transaction that was essentially oral (Nilhamn
2010). Therefore, the task of reconstructing the relations of the names and
signs is a highly difficult one. One may, however, offer conjectural conclusions
based on the list's form: Line 1, revealed thanks to MS imaging, may contain
the title[4] of the list: חלק—the plot (Mendel 2015: 339-343; Na'aman 2016b: 143-
144). Following (lines 2-6, perhaps also 7) is a matrix containing two fields,
two persons, and signs and numerals. The two fields (שדה) together constitute
the larger חלק allotted to both brothers (as opposed to other חלקות allotted to
other family members, not in the list). The signs and numerals relate to the
activities held in the fields and measure them, for example hours of work con-
ducted there or the fields' capacity.

2.2   *Ostracon 2 (Reg. No. 1230/2)*
The letters of this inscription are badly faded, rendering the reading very
difficult. Nevertheless, MS imaging improved the text's legibility and added
31 letters and signs. The color image, the most legible image corresponding

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4 Indeed, as is clear from our presentation, our Line 1 is not the first in the original inscription.
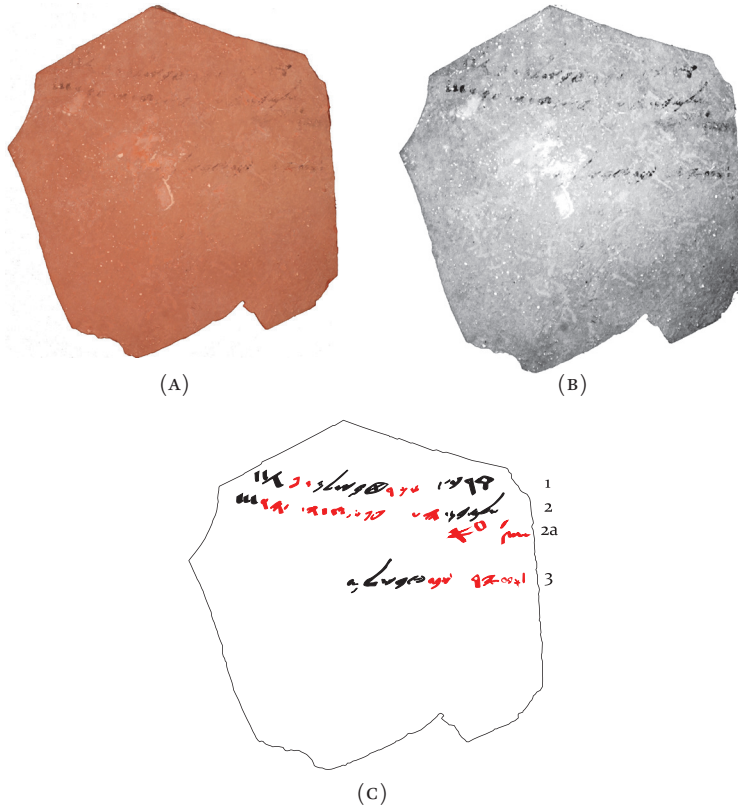   However, the title could *a priori* be longer than one line.

(A)   (B)

(C)

FIGURE 2   **Ostracon 2.** (A) Color (RGB) image; (B) MS image (735 nm)
            PHOTOGRAPHY BY MICHAEL CORDONSKY; PHOTO COURTESY OF THE
            ISRAEL ANTIQUITIES AUTHORITY; (C) FACSIMILE; DRAWING BY
            ANAT MENDEL-GEBEROVICH

to the wavelength of 735 nm, as well as the proposed facsimile can be seen
in Figure 2.

Three complete lines of text are discernible; the space between lines 2 and 3
is larger than the one between lines 1 and 2. At its rightmost edge are faint trac-
es of larger letters, offset obliquely in relation to the other lines (see "line 2a"
below). Hence, this ostracon may be a palimpsest: if it is indeed so, the first
and older line had been written even before the pottery piece was broken and
arrived at its current shape.

Reading:

1.   קרבֹא̇]ור[שכר טבשלם ⸕ בֹ\פ 12

2.   שלם .בן .הוֹ] [עפ— צ.ה. יהֹו 3

<div dir="rtl">

ע[?] א[?] [illegible traces]   2a.

1 אבעזר כבד֝ טבשל֗ם   .3

</div>

1.   Qer*ab*ʾ[ur] rewarded Ṭobshillem *kor\ḥmr* ᵇ\ᵖ 12
2.   Shalem\Shalum son of H*o*[ ] ʿp—ṣ. h. *yhw* 3
2a. [illegible traces] ʿ ʾ

3.   1 Abiʿezer, receipt of Ṭobshillem

Commentary:

Line 1:

<div dir="rtl">

קרב֯א֯[ור] שכר טבשלם ❧ ב\פ 12

</div>

קרב֯א֯[ור] is a good Hebrew name, attested in other epigraphic finds: in Arad inscription 24 (Aharoni 1981: 46-49) and according to Naveh's reading, also in inscription 39, line 3 (Aḥituv 2005: 129-130), as well as in Jerusalem, where it is reconstructed in all probability in inscription 3 from the City of David (Naveh 2000: 3). We follow the *plene* spelling of Arad in our reconstruction; this is also supported by the lacuna in the text, which allows space for two letters. The personal name טבשלם is well-attested in Hebrew epigraphic finds: in Lachish 1, line 2 (Torczyner 1987: 1-24); on a stamp seal from Ein Gedi dated to the late 7th-early 6th centuries (*wss* 172), on two bullae from the City of David (*wss* 508 and 509; Shoham 2000: 34-35) and on two seals from Mamillah in Jerusalem, one of them probably exhibiting the abbreviated form טבש (Reich and Sass 2006).[5]

שכר could be a verb functioning as the predicate, "hired" (for example, Kilamuwa inscription, line 7 [KAI 24]; 2 Kgs 7:6) or "rewarded" (see Hoftijzer and Jongeling 1995: 1135), or else as a noun meaning "salary", "reward" (Num 18:31; Deut 15:18; Jer 31:15; Ezek 29:19).[6]

Line 2:

<div dir="rtl">

שלם. בן. הו֗ן   [עפ— צ. ה. יהו֗ ̇̇̇ 3

</div>

<div dir="rtl">

5 For a discussion of the name's etymology and meaning, see Reich and Sass 2006: 315; for a comprehensive treatment of names with the element שלם, see Golub 2015. We are grateful to Dr. Mitka Golub for bringing this reference to our attention.

6 The meaning "hired" seems to be confined, in both biblical Hebrew and Northwest Semitic epigraphy, to military hiring of foreign kings in times of war, and therefore the meaning "rewarded" is preferable.

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The name of שלם's father is fragmentary, and the middle part of line 2 is hard to read. However, the numerals at the end of the line indicate that it also deals with measurements or payments, similarly to line 1. The letters "עפ" have a graphic similarity to "טב" of the name טבשלם that appears in the two other lines of the text. While it is tempting to read this name in all three lines of the text, we unfortunately cannot vouch for its reading here.

Line 2a:
The gap between Lines 2 and 3 is larger than the gap between Lines 1 and 2. In this gap, we see an additional line located closer to line 2. At the right edge of the line there is an elongated blot of ink. Following this area are two signs that may be letters, perhaps the circle of an *ayin* and a large *ʾaleph*. Both letters, if we read them correctly, are paleographically older compared to the main inscription. In addition, this line is diagonal to the main inscription, and it is cut by the sherd's edge. Hence, we posit that it was written before the vessel was broken (or on a sherd larger than the current one). Therefore, we suggest that the ostracon is a palimpsest.

Line 3:

1   אבעזר   כבֹד טבשלֹם

This line is a good candidate to be an author's signature or a bottom line. The fact that the line is graphically separated—by a significantly large space—from the rest of the text, could mean that it was indeed the signature of the scribe who composed the list. Alternatively, it could be a bottom line containing a general statement relevant to the entire list, telling of its purpose. Some ancient Northwest Semitic administrative documents contain authors' signatures, such as Samaria Ostracon 1, the Ophel Ostracon, Arad Inscription 39 and Jalul Ostracon 1 (Mendel 2015: 340).

כבֹד comes from a root with several meanings, the most preferable one in this context being "honor" (*HALOT*, Vol. II: 455-458; Hoftijzer and Jongeling 1995: 484). In the context of our list, we suggest that אבעזר כבֹד טבשלֹם has to do with honoring the payment to טבשלם, hence—a kind of written receipt. If קרבאור rewarded טבשלם, perhaps the ostracon is the written attestation of the transaction, signed by אבעזר. The fact that the numeral 1 is positioned at the beginning of the line, rather than at its end, as in lines 1-2, must be related to the fact that it serves as a bottom line.
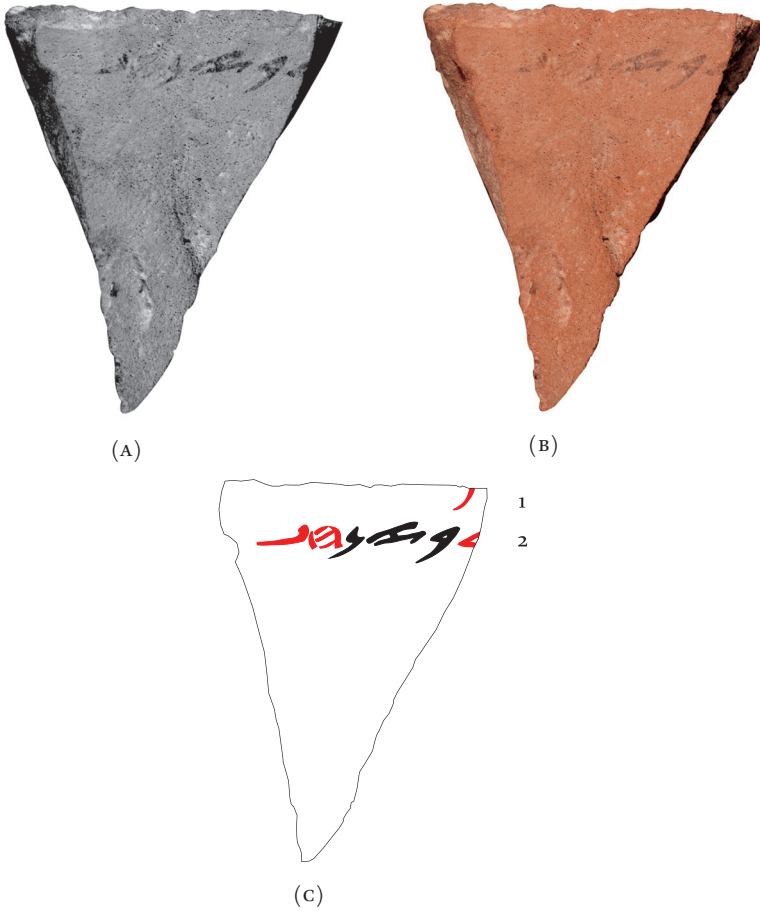
FIGURE 3   **Ostracon 3.** (A) Color (RGB) image; (B) MS image (735 nm)
            PHOTOGRAPHY BY MICHAEL CORDONSKY; PHOTO COURTESY OF THE
            ISRAEL ANTIQUITIES AUTHORITY; (C) FACSIMILE; DRAWING BY
            ANAT MENDEL-GEBEROVICH

2.3   *Ostracon 3 (Reg. No. 1242/1)*

Naveh saw the remains of two letters and read "בזנ" between them (-בזנ-[). For
the fragmentary sign before the *bet* he suggested a *resh* or an *’aleph*, and for the
remnants following the *nun* he conjectured a numeral. Alternatively, he cau-
tiously suggested a *ḥet* after the *nun*, yielding the reading זנח. The color image,
the most legible image corresponding to the wavelength of 735 nm, and the
proposed facsimile can be seen in Figure 3.

The newly obtained images confirm Naveh's suggestion with some additions resulting in the following reading:

1. [ ] מׄוׄבׄוׄנׄוׄכׄ [ ]

2. [ ] דׄוׄרׄוׄל בזנח 100

1.   ] $^{m\backslash b\backslash n\backslash k}$ [   ]
2.   ] $^{d\backslash r\backslash l}$ in Zanoaḥ 100

Commentary:

Line 1: MS imaging revealed the traces of a first line. The remains could belong to a *bet*, *kaf*, *mem* or *nun*.

Line 2: According to the images, a fragmentary letter indeed precedes -בזנח; we may reconstruct it as a *lamed* or, like Naveh, as a *resh* (or a *dalet*). This, however, renders the interpretation difficult, since there is no space between this first letter and what seems like a good reading of the name Zanoaḥ with a prefixed preposition ב. The last sign is comparable to the hieratic sign for 100, attested in Kadesh Barnea Ostraca 1, 3, and 5 (Wimmer 2008: 228). In sum, this is probably an administrative document which mentions a counted good.

3   Summary

Multispectral imaging made a considerable improvement in the legibility of the ostraca from Naḥal Yarmut / Ḥorvat Zanoaḥ. Now clearly visible are 29 new signs in Ostracon 1, 31 in Ostracon 2, and 4 in Ostracon 3. All three ostraca contain names and numerals; No. 1 is a list containing hitherto unattested signs. All three are thus administrative documents, like the majority of ancient Hebrew ostraca, and are specifically attributed to Judah at the end of the seventh century and the beginning of the sixth century BCE.

The administrative nature of the texts fits well within the general interpretation of the site's function as an agricultural complex including a winepress, cellars and other installations. The ostraca were found in Cave A-2, considered to be a cellar within a complex which includes a wine press (A-1) and other installations similar to those found at el Jib-Gibeon (Pritchard 1964) and other places of the Central Hill Country (*e.g.* Walsh and Zorn 1998; Frumkin 2005). Furthermore, olive wood found within the cave and in other installations at the site (Milevski and Naveh 2005) probably attest to the existence of an olive plantation nearby.

The renewed reading of the ostraca helps us understand them as accounting documents dealing with payments during the Iron Age IIC in the framework of

state taxation (Milevski and Naveh 2005: 24; Na'aman 2016a). It also indicates exchange between individuals not related to the state (Na'aman 2012; Mendel 2015: 40-41; 48; 329) or by the king's agents (Na'aman 2012: 97).

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