

# The Ophel (Jerusalem) Ostrakon in Light of New Multispectral Images

Shira Faigenbaum-Golovin, Christopher A. Rollston, Eli Piasetzky,  
Barak Sober, Israel Finkelstein

Tel Aviv University / George Washington University

*Résumé.* L'ostrakon paleo-hébreu de l'Ophel, découvert à Jérusalem il y a près d'un siècle, est en mauvais état. Il est en partie effacé et souffre d'effritement et d'abrasion. Ainsi, des lectures divergentes ont été proposées pour les sections de l'ostrakon qui semblent déchiffrables. L'imagerie multispectrale permet d'améliorer la lisibilité de l'inscription. Grâce à cette technologie, nous présentons ici notre analyse épigraphique de l'ostrakon de l'Ophel, laquelle résout d'anciens débats et ajoute des lettres non identifiées jusqu'alors.

## Introduction

The Ophel ostrakon was unearthed in 1924 in the excavations conducted by Macalister and Duncan in the northern sector of the “City of David” ridge in Jerusalem.<sup>1</sup> Naturally, over the course of some 2,500 years of depositional history, the ostrakon suffered from fading and abrading. Moreover, a white layer that had been present on the sherd before it was used by the scribe, had flaked-off in places, taking some of the ink, especially along the margins, with it (Fig. 1). Also, at some point during its depositional history, the ostrakon seems to have been exposed to particularly damp conditions, with the result that nearly all the ink in the lower part was washed away. Therefore, although the inscription originally contained eight lines of writing, only the first four lines and the

<sup>1</sup> R.A.S. Macalister and J.G. Duncan, “Excavations on the Hill of Ophel, Jerusalem 1923-1925”, *Palestine Exploration Fund Annual* 4, 1926, p. 196-200.

(shorter) eighth line were considered decipherable (only a few letters in the fourth line were legible). Despite the significant variations in the readings suggested for this ostrakon (below), virtually all scholars agree that it contains a list of personal names with theophoric elements.

A recent study by our group<sup>2</sup> has demonstrated that Multi-spectral Imaging (MS) can enhance the legibility of ostraca. Following the standard MS imaging procedures, we produced images of the Ophel Ostrakon and used them for a thorough reanalysis of the inscription. We have been able to confirm the accuracy of some previous readings, point to several erroneous past readings, and propose new readings for lines three and four. We also present a facsimile created via a new semi-automatic method (Fig. 2).

## Methods

### Image Acquisition

An image captured by camera records the light reflected from objects in a particular setting. A standard digital camera produces an RGB (Red, Green and Blue) color photo. This image consists of three color channels, corresponding to different ranges of the visible light (red: 600-700 nm; green: 500-600 nm; blue: 400-550 nm). By combining these channels, the viewer perceives a full-color photo. Utilizing the color image, one can also create a gray level photo by averaging the RGB channels. In addition, each channel can be treated as a separate gray level image.

MS imaging produces a more detailed image than standard photography. Instead of three channels (ranges of wavelengths) representing red, green and blue, the MS imaging typically produces eight, twenty, or even several hundred channels (depending

<sup>2</sup> S. Faigenbaum, B. Sober, A. Shaus, M. Moinester, E. Piasetzky, G. Bearman and I. Finkelstein, "Multispectral Images of Ostraca: Acquisition and Analysis", *Journal of Archaeological Science* 39, 2012, p. 3581–3590.

on the spectral resolution, i.e., the wavelength range of each channel). The outcome of MS imaging is called spectral cube.

An experimental study<sup>3</sup> demonstrated that for each ostrakon (and for each ink degradation degree), the optimal imaging wavelength is between 550 nm and 950 nm. Moreover, in order to capture the most legible image, it is optimal to use ten different band pass filters. Each of these filters allows light in a particular wavelength range to the camera sensors. The end result is ten images recording the reflection of each of these light ranges. Later, an image with the best contrast between the ink and clay is selected; this is done either algorithmically or manually.

The MS imaging procedure was found to be advantageous in several cases.<sup>4</sup> Accordingly, the MS system was utilized to image the Ophel Ostrakon. Due to the uneven degree of ink preservation, several images were used during the analysis. For instance, using filters with transmission centers at 590, 635 were valuable for the end of the first line, while filters with transmission centers at 660, 695, 735 and 775 were helpful for the fourth line. The color image and one of the MS favorable images in the wavelength of 710 nm (the latter after contrast enhancement) are shown in Fig. 1.

<sup>3</sup> See: Faigenbaum et al., op. cit. (above, n. 2).

<sup>4</sup> S. Faigenbaum, B. Sober, M. Moinester, E. Piasezky and G. Bearman, "Multispectral Imaging of Tel Malhata Ostraca", in I. Beit-Arieh and L. Freud, *Tel Malhata: A Central City in the Biblical Negev*, Tel Aviv (Monograph Series of the Institute of Archaeology, Tel Aviv University 32), 2015; B. Sober, S. Faigenbaum, I. Beit-Arieh, I. Finkelstein, M. Moinester, E. Piasezky and A. Shaus, "Multispectral Imaging as a Tool to Enhance the Reading of Ostraca", *Palestine Exploration Quarterly* 146, 2014, p. 185-197.

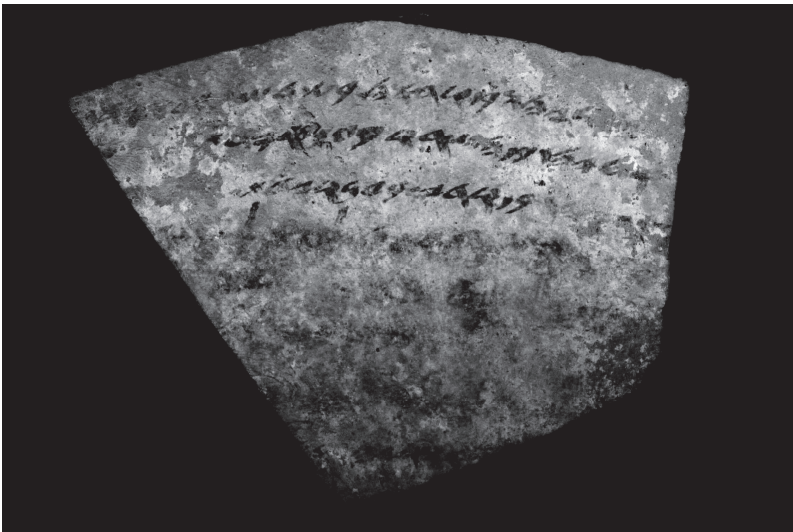


Fig. 1: Top - color image of the Ophel Ostrakon; bottom - image taken with the MS system at the wavelength of 710 nm.

### Semi-Automatic Facsimile Creation

Manually drawn facsimiles have been shown to be imperfect and (in the case of drawings produced after the publication of the *editio princeps*) influenced by the established readings.<sup>5</sup> Therefore, a computer-based method was developed in order to create a drawing depicting the characters in the inscription.<sup>6</sup> This algorithm aims at imitating the writing instrument's movement using several manually-sampled key-points. In order to create a facsimile of a complete ostracon, we reconstruct one character at a time, and later combine them automatically to form a facsimile. This "Stroke Restoration" method was used in order to create a semi-automatic facsimile of the Ophel Ostracon (Fig. 2).

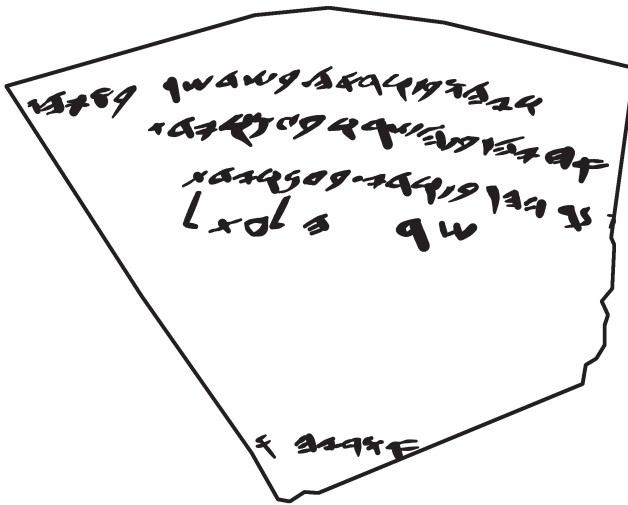


Fig. 2: Semi-automatic facsimile of the Ophel Ostracon created via our "Stroke Restoration" method.

<sup>5</sup> A. Shaus, I. Finkelstein and E. Piasezky, "Avoiding the Eye of the Beholder: Automated Ostraca Facsimile Evaluation", *Maarav* 17.1, 2010, p. 7-20.

<sup>6</sup> B. Sober and D. Levin, "Handwritten Character Stroke Restoration", forthcoming.

An example demonstrating the phases of reconstruction process of the letter *dalet*, originating from the Ophel Ostrakon, can be seen in Fig. 3. First, key points are manually sampled for each of the letter's strokes (Fig. 3 (b)) according to the expert's perception of the letter; next, the letter's strokes are automatically reconstructed (Fig. 3 (c)); finally, the accuracy of the reconstruction is verified manually against the original image (Fig. 3 (d)). Consequently, the most accurate reconstruction of the letter is produced.

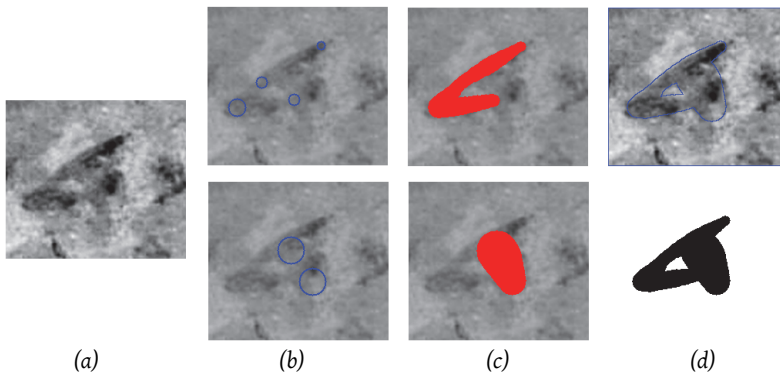


Fig. 3: Example of a semi-automatic stroke restoration of the letter *dalet* from the Ophel Ostrakon. (a) Image of the reconstructed letter; (b) manually sampled key points; (c) the semi-automatic strokes restorations; (d) the reconstructed letter (top: the contour of the reconstructed letter overlay the original image; bottom: the binary image of the restored letter).

## Epigraphic Analysis

The Ophel Ostrakon has been discussed by numerous scholars (e.g., Cook,<sup>7</sup> Albright,<sup>8</sup> Diringer,<sup>9</sup> Torczyner,<sup>10</sup> Moscati,<sup>11</sup> Gibson,<sup>12</sup>

<sup>7</sup> S.A. Cook, "Inscribed Hebrew Objects from Ophel", *PEF QSt* 56, 1924, p. 180-186.

<sup>8</sup> W.F. Albright, "Notes on Early Hebrew and Aramaic Epigraphy", *JPOS* 6, 1926, p. 88-93.

<sup>9</sup> D. Diringer, *Le Iscrizioni antico-ebraiche palestinesi*, Florence, Le Monnier, 1934, p. 74-79.

Sukenik,<sup>13</sup> Ahituv,<sup>14</sup> Milik,<sup>15</sup> Lemaire,<sup>16</sup> Renz,<sup>17</sup> and Dobbs-Allsopp et al.<sup>18</sup>). Using the new MS images, the color image (after adaptive contrast enhancement based on the Michelson method<sup>19</sup>) and the facsimile drawing (Fig. 2), we present our own readings for the ostrakon. We discuss the ostrakon by line; we have often found it useful to divide lines into “segments,” referred to as (a), (b), etc.

<sup>10</sup> H. Torczyner, “The Siloam Inscription, the Gezer Calendar and the Ophel Ostrakon”, *Bulletin of the Jewish Palestine Exploration Society* 7, 1939, p. 138-145 (Hebrew).

<sup>11</sup> S. Moscati, “L’epigrafia ebraica antica: 1935-1950”, *Pontificio Istituto Biblico* 15, 1951, p. 44-46.

<sup>12</sup> J.C.L. Gibson, *Textbook of Syrian Semitic Inscriptions I, Hebrew and Moabite Inscriptions*, Oxford, Clarendon Press, 1971, p. 25-26.

<sup>13</sup> Y. Sukenik, “The ‘Ophel Ostrakon’”, *Bulletin of the Jewish Palestine Exploration Society* 13, 1974, p. 146-149 (Hebrew).

<sup>14</sup> S. Ahituv, *Echoes from the Past: Hebrew and Cognate Inscriptions from the Biblical Period*, Jerusalem, Carta, 2008, p. 32-34.

<sup>15</sup> J.T. Milik, “Notes d’épigraphie et de topographie palestiniennes”, *RB* 66, 1959, p. 550-553.

<sup>16</sup> A. Lemaire, *Inscriptions hébraïques I: les ostraca. Introduction, traduction, commentaire*, Paris, Cerf, 1977, p. 253-255.

<sup>17</sup> J. Renz, *Die althebräischen Inschriften, Teil 1: Text und Kommentar*, Darmstadt, Wissenschaftliche Buchgesellschaft, 1995, p. 310-311. Note that for the Ophel ostrakon, Renz follows all the readings of KAI [190].

<sup>18</sup> F.W. Dobbs-Allsopp, J.J.M. Roberts, C.L. Seow, and R.E. Whitaker, *Hebrew Inscriptions: Texts from the Biblical Period of the Monarchy with Concordance*, New Haven, Yale University Press, 2005 (following Lemaire, except for line 4), p. 206-210.

<sup>19</sup> E. Peli, “Contrast in complex images”, *Journal of the Optical Society of America A* 7, 1990, p. 2032-2040.

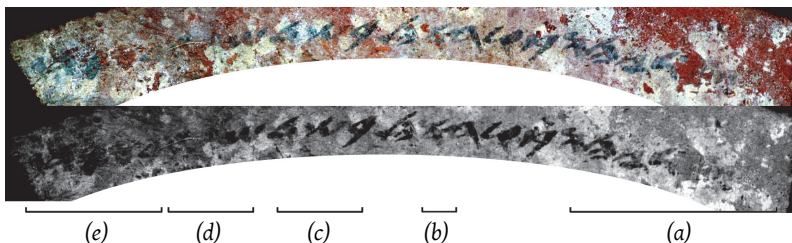
**Line 1**<sup>20</sup>

Fig. 4: Color (after contrast enhancement) and gray level MS image of Line 1.

Cook	ח[ז]קיהו בנ קרא הבתלשי
Albright	יח[ז]קיהו בנ קרא הבתלשי בקיהו
Diringer	יח[ז]קיהו בנ קרא הבתלשי בקי•הו
Torczyner	יח[ז]קיהו בנ קרוה • בשעש בקיהו
Moscatti (and Gibson)	יח[ז]קיהו בנ קראה • בשרש בקיהו
Sukenik	ח[ז]קיהו בנ • קראה • בשרש [?] בבקיהו
Milik	ח[ז]קיהו בנ קראה • בשד ש'לקם ... יהו[...]
Lemaire (Renz and Dobbs-Allsopp et al. <sup>18</sup> )	ח[ז]קיהו בנ קראה בשרש •• בקיהו
Our reading	ח[ז]קיהו בנ קראה•בשד ש[ר][?]בקיהו

The beginning of the first line is abraded (Fig. 4 (a)). Old photographs demonstrate that this had been the case already several decades ago. Therefore, reading a *yod* at the beginning of the line cannot be confirmed, nor could it even have been at the time of the *editio princeps*. The initial part of this line, however, does contain the letters *h[z]qyhw*, thus, forming the well-attested personal name *Ḥizqîyāhû* (2 Kgs 16:20; Isa 36:1; Jer 26:18, et passim), meaning “Yahweh has strengthened me.”

The succeeding letters are *bn qr<sup>h</sup>*, a reading that is agreed upon by almost all scholars. The only major dispute is regarding the letter that follows the *reš* (Fig. 4 (b)). It was transliterated by Torczyner as *waw*, arguably because he (quite naturally) assumed that there was a curved stroke (“tick”) above the letter (previously mentioned by Sukenik). However, the color image demon-

<sup>20</sup> Here and in the discussion of the other lines below, for references to scholars’ proposals see op. cit. (above, n. 7-18).



strates that this is not ink, but a small abrasion (Fig. 5), thus establishing that the correct reading is *ʾalep*. Note that there appears to be a word-divider after the letter *heh* that follows the *ʾalep*. The attested letters, therefore, are *qrʾh*. The root *qrʾ* (“to call, summon, recite”) could be understood here as the core element of a personal name or a title, or vocation (see the titular or vocational language in this ostrakon). Note the presence of personal names in the Hebrew Bible that are based on this root (1 Chr 9:19; 2 Chr 31:4).

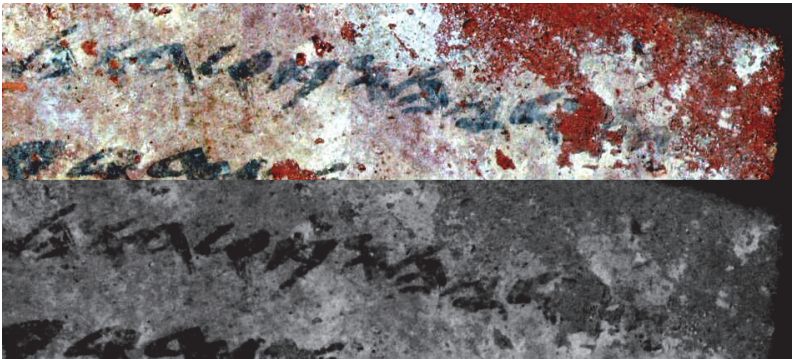


Fig. 5: Color and gray level MS image zoomed-in on the beginning of Line 1.

In Fig. 4, Segment (c) the *bet* and *šin* are clear, but the letter following the *šin* has been the subject of dispute. It is evident that the reading *hbtšy* (Cook; Albright; Diringer) does not correspond to the images. After all, neither *taw* nor *lamed* are present and the word-divider after the *heh* suggests that this is the end of a word (i.e., the preceding word), rather than the beginning of a word. Furthermore, the reading of an *ʾayin* after the *šin* (as proposed by Torczyner) can also be rejected, based on comparison with the standard morphology of the *ʾayins* in this ostrakon. Several scholars have read a *reš* after the *šin*, but this seems to rely on the presumed presence of a long vertical stroke in the gray level image (and the lexical ease of this reading). However, the color image indicates that this is an abraded surface (Fig. 6), not ink. Moreover, the morphology of this letter (with the top stroke of the head extending to the right of the vertical shaft) is most reflective of a *dalet*. Notably this reading, that is, *dalet*, was also Milik’s reading

(yielding for these three letters: *bšd* = *bśd*). That is, we believe that, in light of the traces present, Milik's reading makes the best sense.

Note also that the reading *bśd* (e.g., "in the field of") can be explained in light of the putative structure and content of Lines 2 and 3 of the ostrakon: PN son of PN + prepositional *bet* and the word *mq* ("valley"). We believe Line 1 to have this same basic structure: PN son of PN + prepositional *bet* and the word "field" (*śd*). To be sure, it has been argued by Dobbs-Allsopp et al. that the orthography for the word *śd* ("field") should be *sdh*. But the orthography of this word is particularly complicated (see also Gesenius,<sup>21</sup> paragraph 84a.f). Moreover, the two cases cited by Dobbs-Allsopp et al. as epigraphic support for presupposing the orthographic necessity of a final *heh* are (1) an inscription from the Moussaieff Collection that is a modern forgery;<sup>22</sup> (2) and an inscription from Kenyon's excavations in Jerusalem, which is so fragmentary that it is not clear whether this word is indeed present (it is at the beginning of a line, and the end of the preceding line is not preserved). Also of importance is the fact that the word *śd*, meaning "field," is Common Semitic, with substantial attestation in Northwest Semitic. In short, the presence or absence of a *heh* does not seem to us to be sufficient grounds to rule out the lexeme meaning "field," especially in light of the patterning of Lines 2 and 3.

Segment (d) in Fig. 4 starts with a clear *šin*, which is followed by faded and abraded area. In our opinion, the space that remains from this point of the ostrakon until the letter *bet* (Segment (e) in Fig. 4), is sufficient for two or three letters. The traces of a vertical stroke following the *šin* could be understood as part of a *gimel*, *reš* or *heh*. Looking at the preserved traces, we prefer to read *reš*. Unfortunately, the sign which immediately follows this letter is not decipherable, neither in the color nor in the gray-level imag-

<sup>21</sup> W. Gesenius, *Hebrew Grammar*. Edited and enlarged by E. Kautzsch. Revised and translated by A. E. Cowley, Oxford, Oxford University Press, 1910.

<sup>22</sup> C.A. Rollston, "Non-Provenanced Epigraphs I: Pillaged Antiquities, Northwest Semitic Forgeries, and Protocols for Laboratory Tests", *Maarav* 10, 2003, p. 135-193.

es. It is possible to posit the presence of a word divider<sup>23</sup> as well as an additional letter. Among the attractive possibilities is that of the conjunctive *waw* (i.e., “in the field of the commander and Buqqiyahu), but this cannot be stated with certainty.

The next segment (e) in Fig. 4 begins with a compressed *bet*. Traces of the leg of this letter are discernible. The next letter in the sequence can be interpreted as *qop* or *waw*; we prefer to read the former. The next letters can be read as *yod* and *heh*. The last letter is a *waw*, thus, the standard Judahite theophoric element is present.

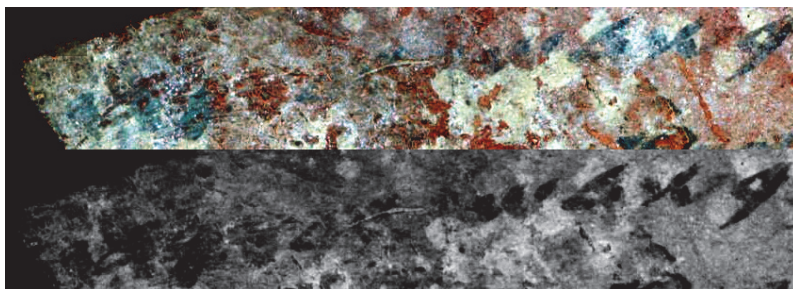


Fig. 6: Color and gray level MS image zoomed-in on the ending of Line 1.

In sum, because of the faded and abraded letters, reading Line 1, Segments d and e is difficult. Based on the content, though, we suggest (as noted above) that the letters of these two segments can be divided into two words: the first is *šr*[?] and the second word the personal name *Bqyhw*. The name Buqqiyahu (cf. 1 Chr 25:4, 13) stems from a geminate root (*bqq*) meaning “to be plentiful.” To be sure, the word that precedes the personal name Buqqiyahu is impossible to determine with certitude. But the *šin* at the beginning of Segment d is certain, and the letter that follows the *šin* has traces of ink that constitute the remains of a vertical stroke that has the proper stance for a *reš*. Positing that there is no letter after the word (but perhaps just a word divider) would allow the reading *šr*, that is, “commander.” But this is not entirely

<sup>23</sup> Regarding this term as a title, see especially Nili Sacher Fox, *In the Service of the King: Officialdom in Ancient Israel and Judah*, Cincinnati, Hebrew Union College Press, 2000, p. 89, 139-142, 150-157, et passim.

certain; therefore, we would propose two primary options: (1) “Ḥizqiyahu son of (the) summoner (or Qori’ah) in the field of the commander, Buqqiyahu,” or (2) “Ḥizqiyahu son of (the) summoner (or Qori’ah) in the field of ...Buqqiyahu.”

## Line 2

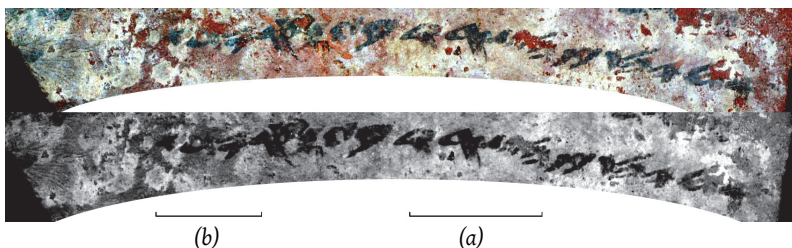


Fig. 7: Color and gray level MS image of Line 2.

Cook	אחיהו בן הצדק בעמק ירת
Albright	אחיהו בן השדק בעמק ירִת
Diringer	אחיהו בן השִׁצְק בעמק יהוִרִת
Torczyner	אחיהו בן השרק בעמק יהו[שפט]
Moscatti (and Gibson)	אחיהו בן השרק בעמק יהו
Sukenik	אחיהו בן השרק בעמקי[הו]
Milik	אחיהו בן השרק בעמק ידת • [...]
Lemaire (Renz and Dobbs-Allsopp)	אחיהו בן השרק בעמק ירִת • [...]
Our reading	אחיהו בן השרק בעמק ידת

The second line is the most legible, hence the variation between the readings of various scholars is minimal. The line begins with the personal name  $\text{ʿhyhw}$ , which can be vocalized as  $\text{ʿAhîyyahû}$ , meaning “Yahweh is my brother.” After this comes the word *bn* – “son.” The first dispute between scholars is in segment (a) in Fig. 7, namely, between the readings of *reš* or *dalet* in the patronymic. Cook and Albright read *dalet*, Diringer lists both *dalet* and *reš* as viable options and most scholars read a *reš*. Palaeographically, though, the reading of *reš* must be considered certain. After all, the long vertical shaft of the letter is diagnostic for a *reš*, and the upper stroke of the head does not extend to the right of the let-

ter's vertical shaft as is the norm with the *dalet* of this period (Fig. 8). The *heh* at the beginning of this word is, of course, the standard Hebrew article. Within this context, it is most reasonable to understand the article to be present because a vocation is being referenced. There are multiple options for the lexical meaning of the word *šrq*: (1) the root *šrq* meaning “to whistle”; (2) the root *šrq* I meaning “to comb” (e.g., flax, wool); (3) and the root *šrq* II meaning “to color something red,” or “to put on makeup.” Of these three lexical scenarios, the most reasonable is to that which refers to combing of flax or wool.

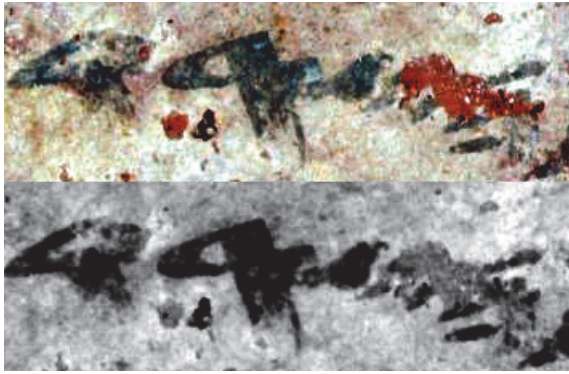


Fig. 8: Color and gray level MS image of the middle of Line 2.

The line continues with the words *b'mq ydt*. We have noted above that we consider the lexeme *'mq* to be “valley.” The reading of *ydt* is certain (Fig. 9). It is most reasonable to consider this word to be cognate with the standard word *yd* meaning “hand.” In terms of gender, this word is, of course, feminine, but the plural is normally formed with *mem*, in the standard fashion of a masculine plural. Nevertheless, the plural form is attested, with the meaning, “a (military) unit” (2 Kgs 11:7) and “axles,” “holders of the wheels” (1 Kgs 7:32). The singular can arguably also mean “monument” (1 Sam 15:12; 2 Sam 18:18, etc.), with the plural here meaning, therefore, “monuments.” It is particularly tempting to suggest that the meaning “monument” is operative, but the context is not sufficient to render a decision with certitude. Understanding this term as referring to a military installation of some sort in the valley is a more cogent position (and corresponds nicely with the

reading *śr* “commander” that we prefer in line one). In any case, with the various caveats and provisos noted above, it is permissible to read *ʿḥyh w bn ḥśrḳ bʿmq ydt*, and translate this line: “Aḥijah the son of the wool-worker, in the valley of the military units”, or “Aḥijah the son of the wool-worker, in the valley of the monuments.”

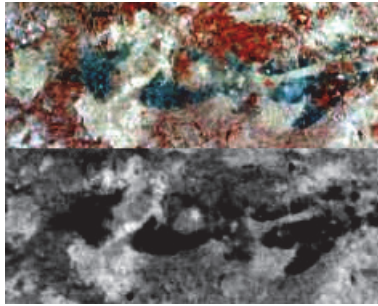


Fig. 9: Color and gray level MS image zoomed-in on the ending of Line 2.

### Line 3

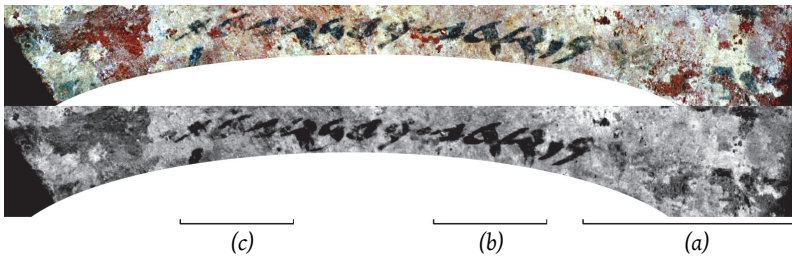


Fig. 10: Color and gray level MS image of Line 3.

Cook	צפ[ג]יהו בנ קרזי בעמקירת
Albright	צפ[ג]יהו בנ קרזי בעמק ידת
Diringner	צפ[ג]יהו בנ קרזי בעמק ידת
Torczyner	...יהו בנ קרצ בעמק יהו[שפט]
Moscatti (and Gibson)	...יהו בנ קרז. בעמק יהו
Sukenik	...יהו בנ קרי בעמקיהו
Milik	צפ[ג]יהו בנ קרי • בעמק ידת • [...]
Lemaire (Renz and Dobbs-Allsopp)	צפניהו בנ קרי • בעמק ידת • [...]
Our reading	צפ[ג]מר[י]הו בנקדי • בעמק ידת

The beginning of the third line is in poor condition (Segment (a) Fig. 10). Although the predominant reading of the personal name at the beginning of the line is *Ṣpnyhw*, we would urge caution. To be sure, it contains the “-yahu theophoric.” The *heh* and *waw* are certain. But we do not find it convincing to read the first three letters as *Ṣpn*. For instance, the preserved traces for the third letter (Fig. 11 (d)) are not reflective of a *nun*. In addition, if the second letter is indeed a *peh*, then the remaining space available is not sufficient for a *ṣadeh*.

For this reason, we suggest a different reading. As already mentioned, the letters *heh* and *waw* are clearly seen. The remaining space available for this personal name is sufficient for three-to-four letters. By examining the first two lines, it is possible to see that the writing does not start right at the edge of the ostrakon. Presuming that this pattern continues in the third line, the writing should start at the letter marked as (b) in Fig. 11. Conversely, it seems that there are traces of ink rather close to the edge (Fig. 11 (a)); in this case it is possible to contend that in the third line the author modified the place at which he began writing. In any case, all that remains from this letter is a horizontal stroke. Since the proper identification of this letter must account not only for the space restrictions, but also for the identity of the letters that follow, we will start with the latter.

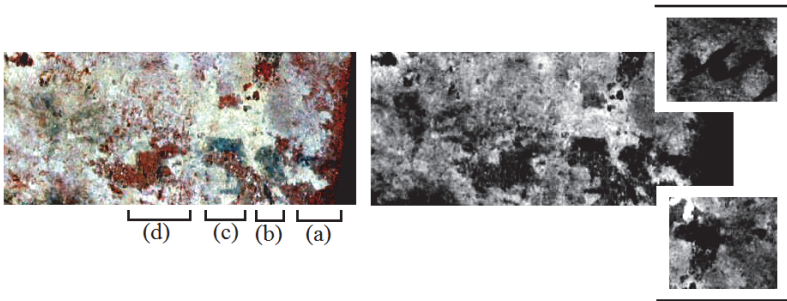


Fig. 11: Color and gray level MS image zoomed-in on the opening of Line 3. Right: *shin* and *ʿalep* are tested as candidates for the first letter; because there is not sufficient space, they are rejected.

The identification of the two letters in (b) and (c) of Fig. 11 must take into consideration the presence of the traces of an elongated

tail of the first letter that actually intersects the vertical stroke of the letter that follows it. The most convincing option is that of a *mem* and *reš*. Note the same basic phenomenon present in ostraca from Arad,<sup>24</sup> Lachish,<sup>25</sup> and Horvat ‘Uza<sup>26</sup> (Fig. 12).

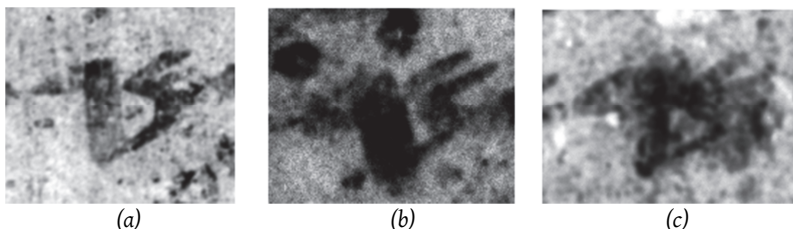


Fig. 12: Examples of *mem* crossing the vertical stroke of a *resh*,  
fragment from (a) Lh3rev.21 (b) Ad2.5 (c) Ad3.5.<sup>27</sup>

Therefore, the discernible portions of the personal name at the beginning of this line can be read as  $[ ]mr[y]hw$ . It is now possible to return to the question of the first letter of this personal name. *Mryhw* is a possible reading, but, as mentioned above, there are some traces of ink prior to the *mem*. The most reasonable candidates for the first letter are *‘alep*, *šin* or *gimel*, all of which would constitute good lexical choices. But because of constraints of space at the beginning of the line (Fig. 11 right), we feel obliged to reject the first two options. The letter which suffices most nicely in terms of traces present and available space is *gimel*. This yields a fine lexical choice, as the root *gmr* (“to complete,” “to destroy,” etc.) is well attested in Northwest Semitic generally,<sup>28</sup> in the He-

<sup>24</sup> Y. Aharoni, *Arad Inscriptions*, Jerusalem, Israel Exploration Society, 1981.

<sup>25</sup> H. Torczyner, *Lachish I: The Lachish Letters*, London, Oxford University Press, 1938.

<sup>26</sup> I. Beit-Arieh, *Horvat ‘Uza and Horvat Radum. Two Fortresses in the Biblical Negev* (Monograph Series of the Institute of Archaeology, Tel Aviv University 25), Tel Aviv, 2007.

<sup>27</sup> Abbreviations: first comes the corpus (Ad = Arad, Lh = Lachish, Uz= Horvat ‘Uza); then the ostracon number and finally the line; for instance Ad2.5 = Arad Ostracon 2, line 5.

<sup>28</sup> C.A. Rollston, “Heshbon A4 (= Heshbon II): A New Reading of a Personal Name”, *BASOR* 350, 2008, p. 87-90.



brew Bible in particular (e.g., Jer 36:10). In addition, it is attested in Arad Inscription No. 40 and in bullae from the “City of David”.

The word following *bn* (segment (b) Fig. 10) has been debated. Fortunately it is followed by a word-divider, demonstrating that this personal name consists of just three letters (Fig. 13). Therefore, the possibility of reading *qrzy* (Cook; Albright; Diringler) is eliminated. Most scholars have understood the second letter as a *reš* (arguably for lexical reasons). Yet, although the letter has a relatively long vertical stroke, the stroke forming the top of the head extends beyond (i.e., to the right of) the main vertical shaft. This “overlap” or “extension” is a distinctive feature of the *dalet* of this period. Therefore, despite the fact that reading a *reš* seems to yield a better lexical meaning, the most convincing reading palaeographically is a *dalet*. Note for example, the standard morphology of *reš* and *dalet* in the Arad Ostraca (Fig. 14).

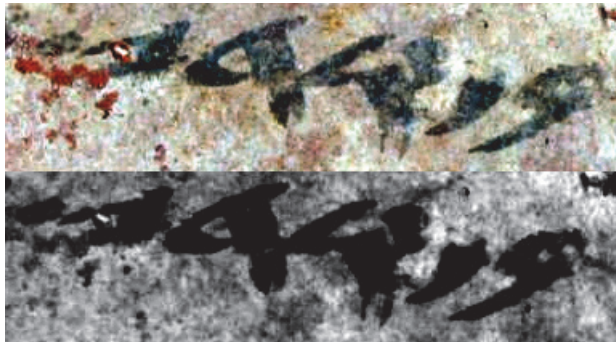
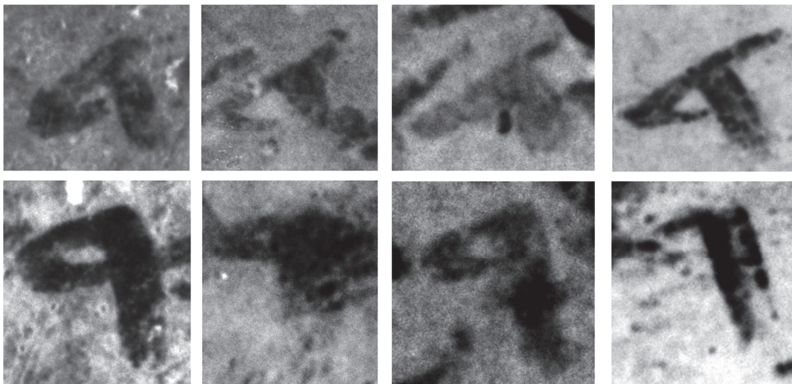


Fig. 13: Color and gray level MS image of the middle of Line 3.



(a) Ad1.5.d1 and Ad1.5.r1	(b) Ad17.8.d1 and Ad17.5.r1	(c) Ad5.12.d1 and Ad5.9.r1	(d) Ad24.14.d1 and Ad24.13.r1
------------------------------	--------------------------------	-------------------------------	----------------------------------

Fig. 14: A comparison of *reš* and *dalet* from the Arad Ostraca; the diagnostic feature of *dalet* (the stroke going upward) is clearly seen.<sup>29</sup>

Accordingly, we read the letters in Figure 10, Section (b) as *qdy*. This is not an attested personal name, but the geminate root *qdd* (“to bow down,” “to kneel down”) would certainly yield an acceptable personal name, particularly in the D-Stem (an attested stem in Akkadian for this root). Of course, the final *yod* could be understood as some sort of a “gentilic” formation.<sup>30</sup> Conversely, some might suggest that the *yod* is a hypocoristic, much as has been argued for Horvat ‘Uza Ostrakon 18.<sup>31</sup> But there is a second viable lexical option, which is even more attractive, namely, to understand *bnqd* as *bn nqd* (i.e., with an assimilated *nun*). The root *nqd* is nicely attested in Semitic languages with the meaning “shepherd,” “sheep-breeder.” This term is used in the Book of Kings in reference to King Mesha of Moab (2 Kgs 3:4). In this case, the final *yod* can still be understood as some sort of a gentilic or hypocoristic. This assimilation of the *nun* (i.e., in the word *bn*) is nicely attested in Phoenician, thus, for example, in the Yehimilk Inscription, we have *byhmlk* (son of Yehimilk) for *bn yhmlk* (KAI 6); the same in the Šipitba‘l Inscription (KAI 7). Similarly, we have *bkly* (“son of Kalby”) for *bn klby* in the ‘Abdo Inscription (KAI 8).<sup>32</sup>

Similar to the second line, this line continues with the words *b‘mq ydt*. Milik mused about the presence of several additional letters after *ydt*. Although traces of ink can be observed in the color image in Fig. 10, the white layer suffers from fading and abrading. It is possible to contend that additional letters were originally present, but are simply no longer recognizable. In any case, in terms of a translation of the decipherable portions of this line, the following can be suggested: *[G]mr[y]hw bnqdy b‘mq ydt*,

<sup>29</sup> For the abbreviations see n. 27 above, with the addition of the letter of interest (d = *dalet* or *reš*).

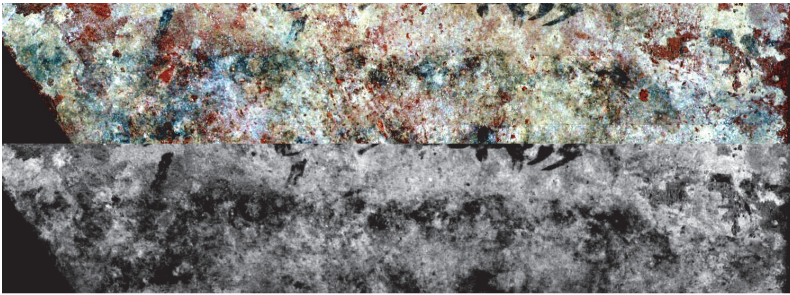
<sup>30</sup> See: Gesenius, op. cit. (above, n. 21), paragraphs 86h and 86i.

<sup>31</sup> See: Beit-Arieh, op. cit. (above, n. 26).

<sup>32</sup> H. Donner and W. Rollig, *Kanaanäische und aramäische Inschriften (KAI)*, II, 6, Wiesbaden, Harrassowitz, 1971.

that is, “Gamaryahu son of a sheep-breeder, in the valley of the military units,” or “Gamaryahu son of a sheep-breeder, in the valley of monuments.” Notice the very nice parallelism of structure with Line 2: “Aḥijah the son of the wool-worker in the valley of the military units/monuments.”

**Line 4**



(g) (f) (e) (d) (c) (b) (a)

Fig. 15: Color and gray level MS image of Line 4.

Cook	-
Albright	[ קיהו ]
Diringer	[ קיהו ]
Torczyner	-
Moscatti (and Gibson)	-
Sukenik	[ יהו ]
Milik	-
Lemaire (and Renz)	[ זדקיהו ]
Dobbs-Allsopp et al.	[ יהו בור ]
Our reading	[ שר[?]יהו ] לעתל

Although the existence of Lines 4 through 7 is certain, it is challenging to decipher their letters because of the poor state of preservation. We concentrated on Line 4, since its traces are the most legible. To date, scholars have been able to identify only a few letters, with the presence of a presumed theophoric being the only agreement. Dobbs-Allsopp et al. suggested to read [ ]yhw bn

*r*]; however, since the beginning of the line is quite faded and abraded, caution is required. Among the problems is the fact that the traces do not support the reading of the *nun*, even though based on the previous lines presupposing the presence of *bn* is reasonable (as is, of course, reading a theophoric). Ultimately, though, we consider the beginning of the line (Segment (a) in Fig. 15) to be indecipherable, in spite of the valiant efforts of KAI (which was followed by Lemaire and Renz).

The MS images that we have produced have been useful for some of the subsequent segments of Line 4. The first letter in Segment (b) in Fig. 15 can be identified as *šin*. Our reading is based on the traces of two pairs of strokes in the form of a *v*. The line continues with a clear *reš* (Fig. 15 (c)); we do not consider *dalet* a viable option due to the long vertical shaft that is present. The next two letters (Fig. 15 (d)) are particularly challenging and the traces are so faint and washed out that it is not prudent to attempt to posit readings. Within our Figure 15, Segment (e) is a faint *heh*, as already suggested in the past by Albright, Dinger, Sukenik, Lemaire, Dobbs-Allsopp et al. There may or may not be a letter prior to the first *lamed* of our Figure 15, Segment (f). Various readings come to mind, including repetition of some of the content from previous lines (e.g., *śr* or *śrq*), but there is simply not enough data present to posit something with much certitude.

Fortunately, the letters of our Segment (f) are substantially more legible. The word begins with the traces of a *lamed*. The succeeding letters can be identified as *‘ayin* and *taw*, followed by another clear *lamed*. Based on the available space and the traces of ink, there were certainly some additional letters (four at the most) that followed the second *lamed*. But these are not decipherable. In any case, the letters *l‘tl* are present. There are two major difficulties, though, namely, determining the letters that preceded and followed the letters *l‘tl* and also, therefore, determining whether these letters are part of a single word or portions of two words. Most attractive at some level is to read here the root *‘tl* (meaning essentially “to be great, lofty, supreme,” etc.). Of course,

this root is attested in Hebrew personal names<sup>33</sup> (e.g., Ezr 10:28; 2 Kgs 8:26) and also in Phoenician.<sup>34</sup> It may even be present in Amorite.<sup>35</sup> The East Semitic (Akkadian) word *etellu* (and its congeners) is also arguably cognate with Northwest Semitic *ʿtl*. Therefore, it is at least plausible to posit that the combination of letters *ʿtl* is a personal name, preceded by a prepositional *lamed*. This would presuppose that this line of the inscription differs from the patterning of the preceding three lines (which mention a personal name and then refer to valleys and fields). But patterns in texts are almost always consistent and there are often epigraphic texts that contain rather long lists of personal names, without much or any additional data (e.g., Arad 31, 35, 38, 39, 58, 59, Lachish 1, Horvat ʿUza 3, 10, 12, 14, 18, 19, 21, 23, 24, 34).<sup>36</sup> Of course, based on the analogy of the first three lines of the Ophel Ostrakon, someone might suggest that it is the root *ʿtl* that is attested and that it refers not to a person but to a piece of premium or regal property in the vicinity. Ultimately, however, certainty is elusive. We consider the reading *lʿtl* to be certain, but the precise signification is not possible to determine because of the dearth of contextual evidence about the letters that precede and follow.

<sup>33</sup> For a detailed, recent discussion see O. Sergi, “Judah’s Expansion in Historical Context”, *Tel Aviv* 40, 2013, p. 226-246.

<sup>34</sup> F.L. Benz, *Personal Names in the Phoenician and Punic Inscriptions: A Catalog, Grammatical Study, and Glossary of Elements*, Rome, Biblical Institute Press 1972, p. 388.

<sup>35</sup> H.B. Huffmon, *Amorite Personal Names in the Mari Texts: A Structural and Lexical Study*, Baltimore, Johns Hopkins Press, 1965, p. 205.

<sup>36</sup> For Arad Ostraca see: Aharoni, op. cit. (above, n. 24); for Lachish inscriptions see: Torczyner, op. cit. (above, n. 25); for Horvat ʿUza, see Beit-Arieh, op. cit. (above, n. 26).

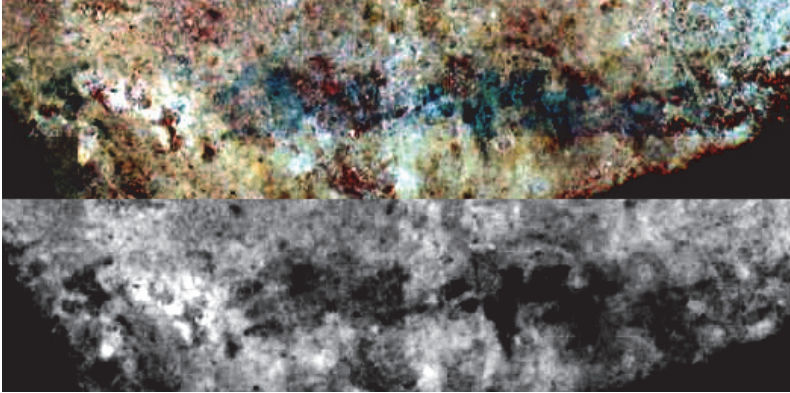
**Line 8**

Fig. 16: Color and gray level MS image of Line 8.

Cook	-
Albright	ח[זקיהו ]
Diringer	• [יח]זקיהו
Torczyner	-
Moscatti (and Gibson)	-
Sukenik	-
Milik	הודיהו ה • [ספר...]
Lemaire (and Renz)	<u>בנ אוריהו ה [...]</u>
Our reading	אוריה [ו] ו

Although Lines 5 through 7 are essentially entirely faded and abraded, the short Line 8 is in surprisingly good condition (Fig. 16). The first two letters are *ʾalep* and *waw*. The letter that follows the *waw* is touching it. It has a relatively long leg. The morphology of the head of this letter causes us to read it as a *reš*. After this, traces of a *yod* and *heh* are present. Although no traces remain, it is convincing to posit a *waw* after the *heh*, forming the theophoric element of this personal name (*ʾwryhw*). After this, there are traces of the head of a *waw*, arguably the conjunction. The latter suggests that the ostrakon has been broken on the left. In any case, the personal name *ʾwryhw* is attested in the Bible (e.g., Jer 26:20-23) as well as in the Old Hebrew epigraphic record (e.g., Ostrakon No. 19 from Horvat ʿUza).

## Discussion

Our reading of the Ophel Ostrakon, which is based on our new multispectral images, is as follows:

- |  |                                      |    |
|--|--------------------------------------|----|
|  | ח[ז]קיהו בן קראה בשדה ש[ר] [?] בקיהו | .1 |
|  | אחיהו בן השרק בעמק ידת               | .2 |
|  | ג[ג]מר[י]הו בנקדי בעמק ידת           | .3 |
|  | שר[?]יה[ו] לעתל...                   | .4 |
|  |                                      | .5 |
|  |                                      | .6 |
|  |                                      | .7 |
|  | אוריה[ו] ו                           | .8 |
1. Ḥizqiyahu son of (the) summoner (or Qori'ah), in the field of (the) commander [and] Buqqiyahu  
Or: Ḥizqiyahu son of Qori'ah in the field of ...Buqqiyahu.
  2. Aḥijah the son of the wool-worker, in the valley of the military units/monuments
  3. Gamaryahu son of (the) sheep-breeder, in the valley of the military units/monuments
  4. [     ]šr...yahu to 'tal...[?]
  - 5.
  - 6.
  - 7.
  8. ʿUriyahu and

The Ophel Ostrakon seems to be quite complete, with Line 1 arguably the first line of the original inscription. The original right and left margins of the ostrakon also appear to have been preserved. Furthermore, this ostrakon may have originally consisted of just eight lines, but since Line 8 contains only a single personal name, someone could suggest that this portion of the ostrakon was broken at some point during its depositional history. Ultimately, however, the faded and abraded nature of this text requires that definitive statements not be made.

The script of this inscription is that of an educated scribe. The morphology, size and stance of the letters reflect the standard for the very late 7<sup>th</sup> century BCE or the very early 6<sup>th</sup> century BCE.

The spacing between the letters was done carefully. This inscription is the work of a veteran scribe, well-educated in the formal, standardized Old Hebrew script.<sup>37</sup> It is of the same high caliber as the contemporary Old Hebrew inscriptions from Arad and Lachish.

The preponderance of the -yahu theophoric element is in keeping with the standard practices for Judahite personal names.<sup>38</sup> Lists of names are well attested in the epigraphic Old Hebrew corpus, with items from Arad, Horvat 'Uza, Tel Ira, and Lachish among the inscriptions of this sort.<sup>39</sup> Moreover, the names themselves (e.g., Hizqiyahu, Buqqiyahu, Ahijah, Gamaryahu) are all of a standard sort, attested in the Hebrew Bible, the epigraphic record, or both. The presence of lexemes that can readily be understood as titles is interesting, but the usage of titles is attested in both the Hebrew Bible and the corpus of Old Hebrew inscriptions.<sup>40</sup> It suggests that this ostrakon hailed from officialdom. The fact that there are geographica in this inscription (valley occurs twice, field once) is tantalizing, but even this is not unique, as there is a rather similar case in the Ahiqam Ostrakon from Horvat 'Uza.<sup>41</sup>

In terms of the putative purpose of the Ophel Ostrakon, the dearth of content leaves various possibilities open. It seems most tenable to argue that it is to be connected with Judahite officialdom in some fashion, much as can be stated with certainty regarding Arad, Samaria, and Lachish.<sup>42</sup> Any specific interpretation seems to us to be too speculative.

<sup>37</sup> C.A. Rollston, "Scribal Education in Ancient Israel: The Old Hebrew Epigraphic Evidence", *BASOR*, 344, 2006, 47-74.

<sup>38</sup> For data and discussion, see especially Jeffrey H. Tigay, *You Shall Have No Other Gods: Israelite Religion in the Light of Hebrew Inscriptions*, HSS 31 Atlanta, Scholars Press, 1986, p. 47-63.

<sup>39</sup> See Arad Ostraca 31, 35, 38, 39, 58, 59; Horvat 'Uza 3, 10, 12, 14, 18, 19, 21, 23, 24 and 34; Lachish 1<sup>25</sup>; Tel 'Ira 1.

<sup>40</sup> See: N.S. Fox, *op. cit.* (above, n. 23).

<sup>41</sup> I. Beit-Arieh, "Epigraphic Finds," *op. cit.* (above, n. 26), Ostrakon 10 (p. 139-143).

<sup>42</sup> For example, N. Na'aman, "The Distribution of Messages in the Kingdom of Judah in Light of the Lachish Ostraca", *Vetus Testamentum* 53.2, 2003, p. 169-180.



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