Journal of Ancient Egyptian Interconnections

An Egyptian Private-Name Scarab Impression on a Clay Sealing from the City of David

Shirly Ben-Dor Evian
Israel Museum, Jerusalem and Tel Aviv University

Anat Cohen-Weinberger
Israel Antiquities Authority

Baruch Brandl
W. F. Albright Institute of Archaeological Research, Jerusalem

Yehudit Harlavan
Geological Survey of Israel

Yuval Gadot
Tel Aviv University

Abstract
A tiny fragment of a clay sealing impressed by an Egyptian scarab was unearthed in 2014 during excavations by the Tel Aviv University at the City of David. The legible hieroglyphs form part of an inscription that provided the name and title of the seal owner, most likely a dignitary from the time of the 13th Dynasty. Close inspection of the sealing revealed that it was used to seal a box, and a provenance analysis of the clay proved it to be of local composition. In light of these findings, other Egyptian objects from MBIIA contexts, such as Egyptian seals, sealings and pottery are reevaluated in order to assess the extent of the relations between Egypt and the Levant in general, and Jerusalem in particular.

Introduction
In October 2014, a fragment of a clay sealing was found during wet-sifting and picking of material from area D3 of the Tel-Aviv University excavations in the City of David (Basket no. 19119; L1184). The very small fragment includes two columns of Egyptian hieroglyphs stamped by a Middle Kingdom period seal. Although tiny, the sealing allows for a fresh discussion of the interrelations between Egypt and cities in Canaan during this period.

Context
Area D3 in the City of David is located near Areas B, D1, D2 and E of Y. Shiloh's excavations,[1] and just above the Kidron's streambed (Fig. 1). Excavations in this area were conducted by Tel-Aviv University in cooperation with the Israel Antiquities Authority between 2013 and 2015 and were meant to extend Y. Shiloh's excavations areas eastward and down the slope towards the Kidron valley.[2] The area is a 40 m long and 25 m wide section, oriented west–east into the occupational level of the site. The most dominant

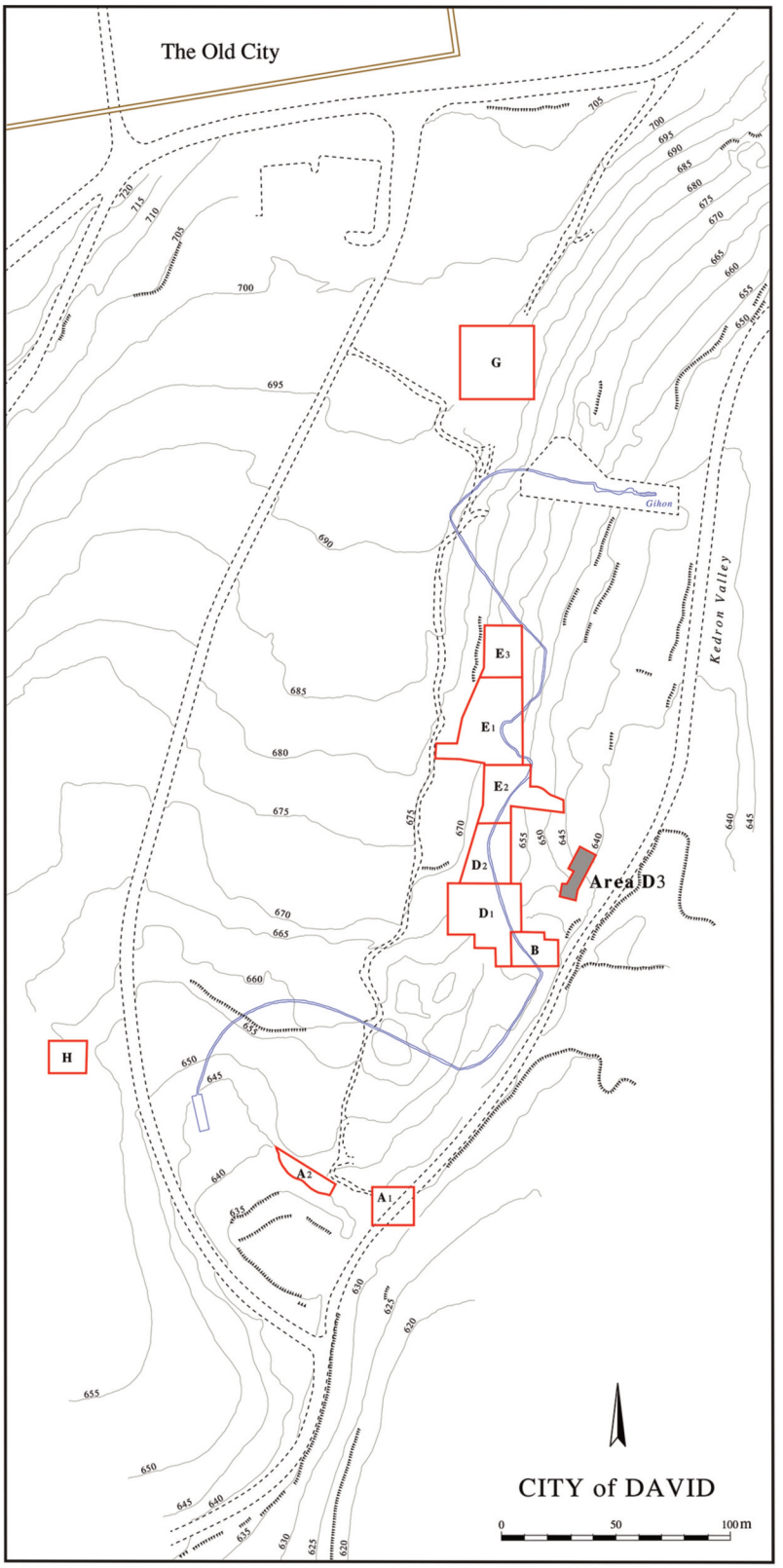

FIGURE 1: The "City of David" ridge and the location of Area D3.

feature in the area is a ca. 10 m deep landfill (garbage disposal area) dating to the Early Roman period and covering the slopes of the hill.[3] During the 2014 season, a domestic structure dating to the Iron Age II and built directly on sloping bedrock was unearthed, along with architectural remains dating to the Hellenistic period. Locus 1184 consisted of make-up fill for a floor that should probably be dated to the Hellenistic period. Indicative pottery found in the make-up fill was dated to the Iron Age and the Hellenistic period. No Middle Bronze Age sherds were identified inside the fill or in any of the adjacent loci. The nearest architectural remains from the Middle Bronze Age were found further up the slope in Y. Shiloh's Areas E1, E2 and E3, ca 30 m to the north of Area D3.[4] Clearly, the clay sealing fragment was lying outside of its original context and could have originated from anywhere in the City of David.

DESCRIPTION

The clay sealing fragment measures 15.8 x 10.9* x 6.8 mm (FIGS. 2, 3). Based on the preserved impression, and the remaining scroll-border and frame (allowing for a maximum of three scrolls per length[5]), the length of the original seal would have been 20 mm and the width 11.1 mm.

The nature of the impression, typically rendering the name and title of an official (see below), reveals that the sealing was undoubtedly stamped by a scarab seal (see reconstruction of the impression, the sealing and the scarab's base in FIG. 4).

The text on the impressed side comprises two vertical columns of hieroglyphic signs encircled by joined oblong scrolls[6] and

Figure 2: Sealing fragment, multiple views (photographed by Tal Rogovski).

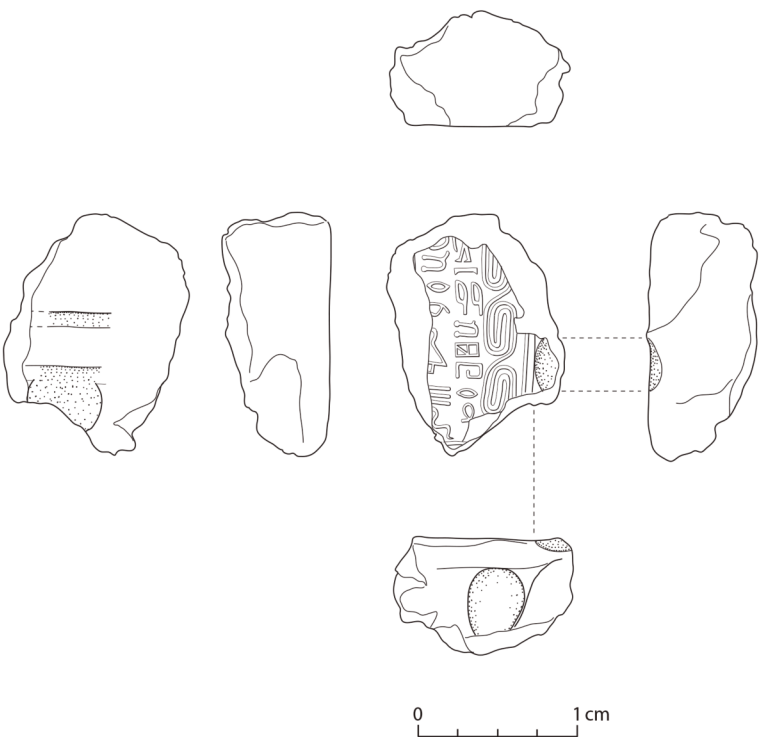

Figure 3: Drawing of sealing fragment, multiple views (drawn by Carmen Hersch).

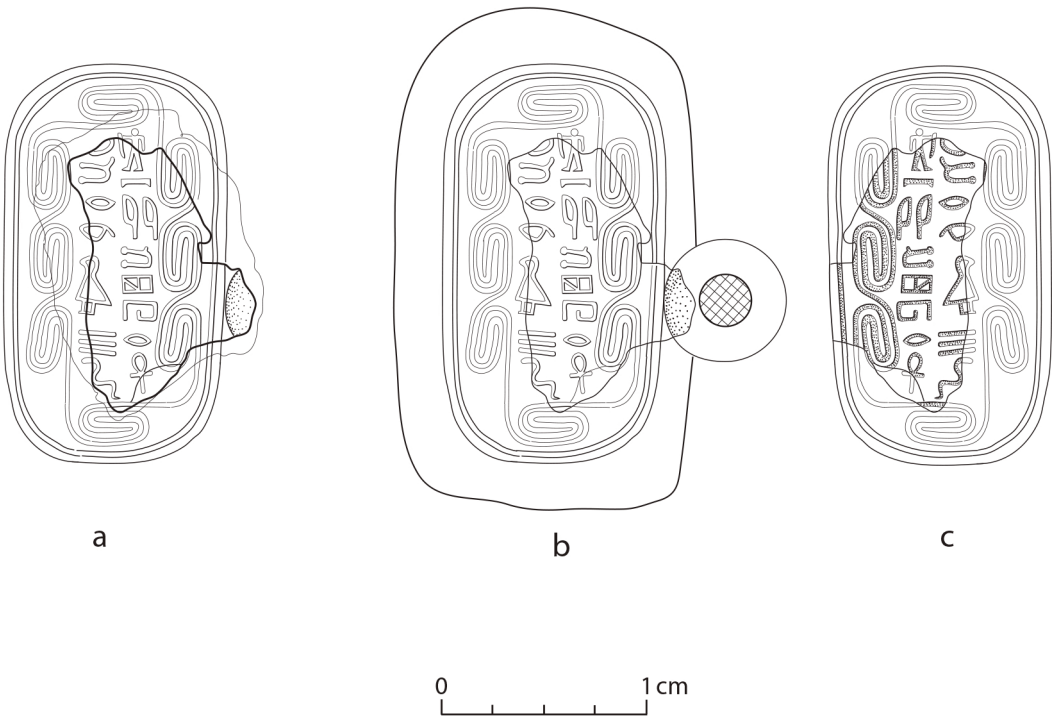

Figure 4: Reconstructions: **a:** the impression; **b:** the sealing; **c:** the scarab's base (drawn by Carmen Hersch).

bordered by a frame. The first column (on the left) consists of seven or eight signs, and the second column (on the right) consists of nine signs. The signs on the first column are mostly broken but for the top rope sign (V14) above a bread sign (X1) or a small mouth sign (D21), followed by a partial basket sign (V31), the right tip of a possible bird sign (G1, G5 or G17), two horizontal strokes above a loop, possibly of an *ꜥnḫ* sign (S34). The second column starts with the bottom part of a standing figure holding a stick (A20) above a sky sign (N1), two reed leaves (M17), a rope sign (V14), an unidentified rectangular sign above the reed shelter (O4), the mouth hieroglyph (D21), and the upper part of a possible *ꜥnḫ* sign (S34).

Despite the fragmentary state of the sealing, it is most likely that the hieroglyphic text recorded the name and title of an Egyptian official, imprinted by a type of scarab that was popular in the late Middle Kingdom. Based on the numerous examples of this genre from both Egypt[7] and Canaan,[8] one can assume that the signs in the upper part of the text recorded the owner's title while the lower part bore his name and a funerary epithet.

Unfortunately, the surviving signs do not suffice for a definite reconstruction. The first signs from the top (in the second column) can be deciphered as *smsw ḥ3y.t* = "elder of the portal," a title that commonly begins at the top of private-name seals from Egypt,[9] and Canaan.[10] The following signs may render the name of the official, but the fragmentary state of the piece prevents any conclusiveness. Two known seals of "elders of the portal" include similar hieroglyphic signs as in the City of David sealing. The first with the private name *Ypṯ-ḥr* (Fig. 5),[11] and the second carrying the name of *Wsr-w3ḏyt*.[12]

Of the two, *smsw ḥ3y.t Ypṯ-ḥr* seems to best accommodate the legible signs on the impression. The element *ḥr* in Middle Kingdom and Second Intermediate Period private names has been viewed as the ending of Semitic names in Egyptian transcription, although which Semitic group is

Figure 5: Private-name scarab of the elder of the portal, *Ypṯ-hr* (after Martin 1971: pl. 11: 12).

represented, is still a matter of debate.[13] Thus, it seems that the sealing records the Semitic name of an official carrying a traditional Egyptian title.

Other, less common titles may also be reconstructed. The presence of the *ṯ* sign may point to the "*ȝṯw n* = attendant of the…"[14] known from a seal impression at Tell el-'Ajjul.[15] Alternatively, the upper signs can be read as *jnjj* = bearer, attested on a single scarab from a private collection, now in the Israel Museum.[16]

Of the legible signs in the middle section, the enigmatic sign above the *h* might be the hieroglyph for palace— *ḫ*—as in the title *ḫrp-ʿḥ* =controller of the palace,[17] attested on scarabs from Canaan as well.[18] Alternatively, the combination of the first column might be a variation of "*smsw js.t m pr.wjj* = elder of the palace in the Double House."[19]

The lowermost signs on the first column could be the remains of an "ʿ*nḫ*," commonly used as part of a funerary epithet (*wḥm* ʿ*nḫ*) on similar title seals.[20] Other reconstructions of the text exist, however none is satisfactory, given present knowledge of Egyptian titles of the Middle Kingdom.[21]

The Reconstructed Sealed Object

The back side of the sealing is partially chipped, therefore very little has remained of the original backside to indicate the material to which the sealing was attached.

Nevertheless, magnified photographs and drawings of the sealing from six views (Figs. 2, 3) allowed for the identification of two distinct impression marks:[22]

- The first impression on the right margin of the stamped face beyond the scroll border, characterized by a shallow and very smooth concave depression of modest size, was caused by the edge of a metallic button-shaped handle. It can be observed also on two perpendicular views.

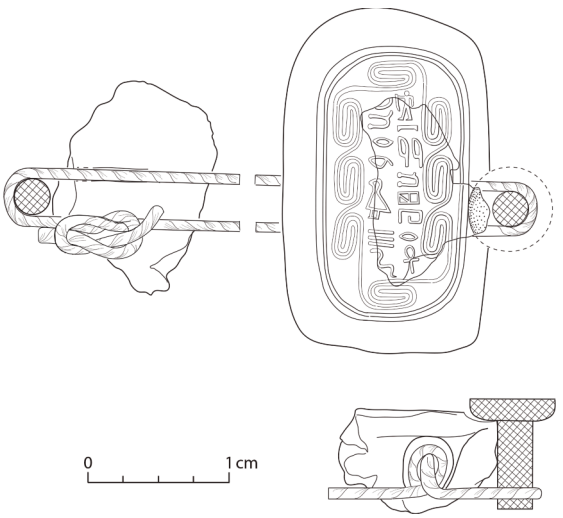

Figure 6: Reconstructions of the metallic handle; the rope and its knot (drawn by Carmen Hersch).

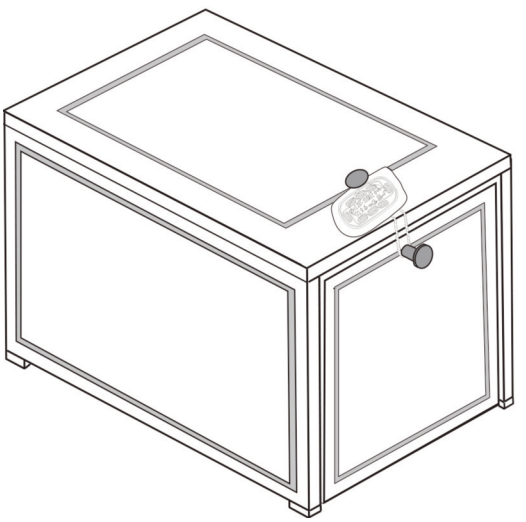

Figure 7: Reconstruction of the sealed box (drawn by Carmen Hersch).

- Rope-mark impressions can be seen on the back of the sealing as well as below the first impression.

The impressions indicate that the sealing was attached to a metallic handle and to the rope's knot that encircled the handle and locked it with the other handle (Fig. 6), suggesting that the sealing was used to seal a box (Fig. 7).

The metallic handle points to the origin and manufacturing date of the box. While previous box sealings that have been found in Canaan were pressed onto wooden peg handles and mushroom shaped buttons,[23] the presently suggested box has a parallel only in Egypt, the one belonging to the butler Kemu-ny from Thebes, dated to the Twelfth Dynasty.[24] This luxurious type of box has also an inner drawer, contrary to the simple box that has only a lid.[25]

As a locally made MB IIA box sealing (see below—Provenance), it joins a group of 15 others box sealings from the moat at Ashkelon[26] that were made from the local loess soil.[27] Likewise, it joins a locally made sealing from the same location that was attached to an imported Egyptian stone vessel, clarifying that imported containers were also re-sealed in Canaan.[28]

Provenance

Petrography and chemical analysis were conducted in order to identify the provenance of the sealing. The clay sealing was carefully observed with a magnifying glass and a sample measuring a few mm thick was taken from a broken facet by very fine needle-nose pliers. A thin section was prepared from the minute sample by a regular procedure and examined under a petrographic microscope.[29] The chemical analyses were conducted at the Geological Survey of Israel laboratory using a Quanta 450 FEG Environmental Scanning Electron Microscope (ESEM) equipped with energy-dispersive spectroscopy (EDS).

The petrographic analysis of the sample showed that the raw material is characterized by ferruginous matrix with strong optical orientation (Fig. 8). Clay pellets appear in the matrix as well as few silt- to fine-sand-sized calcareous fragments and quartz grains (< 2%). The small sample size as well as the absence of indicative silt- to sand-sized components inhibits a definite determination of the raw material. Nevertheless, the petrographic observation suggests that terra rossa soils are the likely sources of the raw material. This is because terra rossa soils are ferruginous and, like most of the Israeli soils, are usually affected by aeolian dust deposits.[30] The aeolian contribution in terra rossa soils includes a

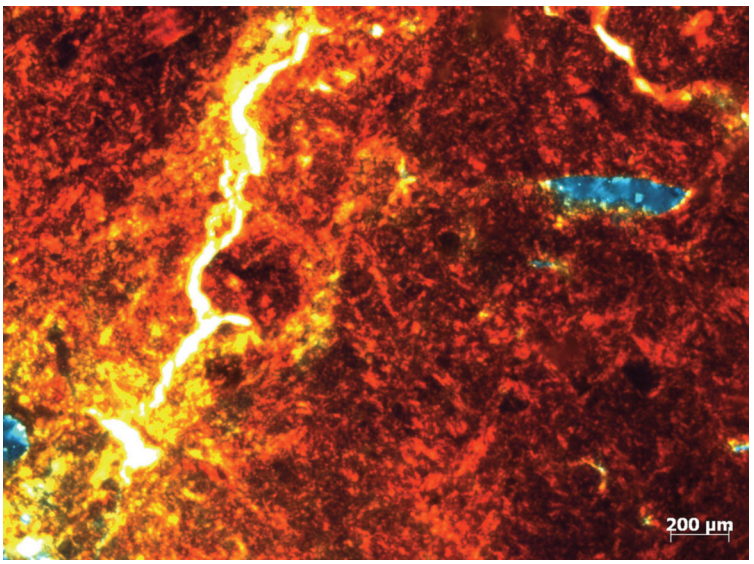

Figure 8: Photomicrograph of bulla B.191190, ferruginous matrix.

significant amount of silt fraction that is composed primarily of quartz, with minor quantities of feldspar, calcite, and heavy minerals. Among the heavy minerals, ore minerals are the most dominant group, followed by epidote and zircon.[31] Terra rossa may also include a few silt-sized components.[32] However, the particle size distribution of terra rossa soils is dominated by clays (> 60%), hence the amount of the silt fraction is minor to moderate. The lack of silt-sized components in the current bulla can be attributed to the depth of the quarried soil, or alternatively, to natural sifting of the quartz from mud. Indeed, in most terra rossa soils there is a slight increase in clay content with soil depth and a decrease of aggregate sizes.[33] The ferruginous matrix of the sealing rules out calcareous clays and soils such as the loess soil that was used for the sealings from Ashkelon. The Nile is another possibility for the sealing provenance; however, the composition of the silt fraction in Nile sediments is different from that of the terra tossa and includes minerals such as mica, pyroxenes, amphiboles, and heavy minerals.[34] Notably, these components are absent from the sealing's raw material. Moreover, SEM observations indicate that the sealing consists mainly of clay with ca. 2% of very fine quartz grains and no other rock fragments or minerals were detected.

In addition to the petrographic observations, the chemical composition of several different frame areas of the sealing determined by EDS and Iron Age bulla from the City of David was also analyzed for comparative purposes.[35] The measured major elements are presented in Table 1. Analysis of the elemental composition reveals that the clay consists of Al, Si, Mg, and minor amounts of K and, thus, can be identified as illite/smectite (Table 1). The clay pellets show the same chemical composition as the overall matrix. It was reasoned that comparison between the sealing, the Iron Age bulla (which was unambiguously identified by petrography to be of terra rossa soil), and a Nile artifact may reveals its provenance. In addition, common soils in Israel, and in some cases their clay fraction, can also shed light on the sealing provenance (Figs. 9a, 9b). Comparison is best shown by utilizing oxide ratios rather than element concentrations. The most significant ratios used are Al_2O_3/TiO_2, Al_2O_3/FeO, FeO/TiO_2, and Al_2O_3/MgO. These ratios exclude elements that are known to be affected by post-depositional processes, such as Na, Cl, P, and Ca. In addition, the Al_2O_3/SiO_2 ratio was also excluded because slight variations in quartz content in soils, which can result in large changes in this ratio. The above figures show that the sealing compositions highly resemble that of clays separated from terra rossa of Judea, while all other options are excluded. Moreover, when comparing the sealing to the Iron Age bulla, a cuneiform tablet from the Ophel excavations in Jerusalem that was identified as terra rossa,[36] ceramic and cuneiform tablets made of Nile sediments,[37] loess made ceramic wasters[38] and terra rossa soils (bulk and clay),[39] it clearly shows distinct populations (Figs. 9c, 9d). The population of the Nile-associated artifacts differs from that of the sealing, the Iron Age bulla, and the Ophel tablet. Moreover, the sealing has the same trend as the clay fraction of the terra rossa soils, mainly constant value of Al_2O_3/TiO_2 ratio and a wide range of Al_2O_3/FeO ratios (Fig. 9c). Similarly,

Table 1: Major elemental composition (wt %) and calculated oxide ratios.

EDS Frames	SiO_2 ±0.2σ	Al_2O_3 ±0.1σ	FeO ±0.15σ	TiO_2 ±0.06σ	CaO ±0.08σ	MgO ±0.04σ	K_2O ±0.08σ	Al_2O_3 /MgO ±0.2%	Al_2O_3 /TiO_2 ±0.1%	Al_2O_3 /FeO ±0.2%	FeO /TiO_2 ±0.2%
Sealing											
1,25 μm	49.7	21.6	7.66	1.15	1.66	1.38	3.26	15.67	18.80	2.82	6.66
2, 100 μm	48.6	18.3	6.55	1.08	1.80	1.36	2.88	13.46	16.95	2.80	6.06
3, 400 μm	42.3	18.0	6.81	0.92	4.01	1.69	2.63	10.67	19.60	2.65	7.40
4, 100 μm	40.6	17.1	7.36	0.92	4.26	1.59	2.67	10.77	18.61	2.33	8.00
5, 100 μm	50.1	18.1	6.89	1.12	3.10	1.80	3.40	10.04	16.13	2.62	6.15
6, 400 μm	22.4	8.5	4.24	0.52	7.05	1.09	2.00	7.83	16.42	2.01	8.15
Bulla Iron Age											
400 μm	27.0	7.5	3.51	0.54	4.43	1.04	0.96	7.17	13.81	2.13	6.50

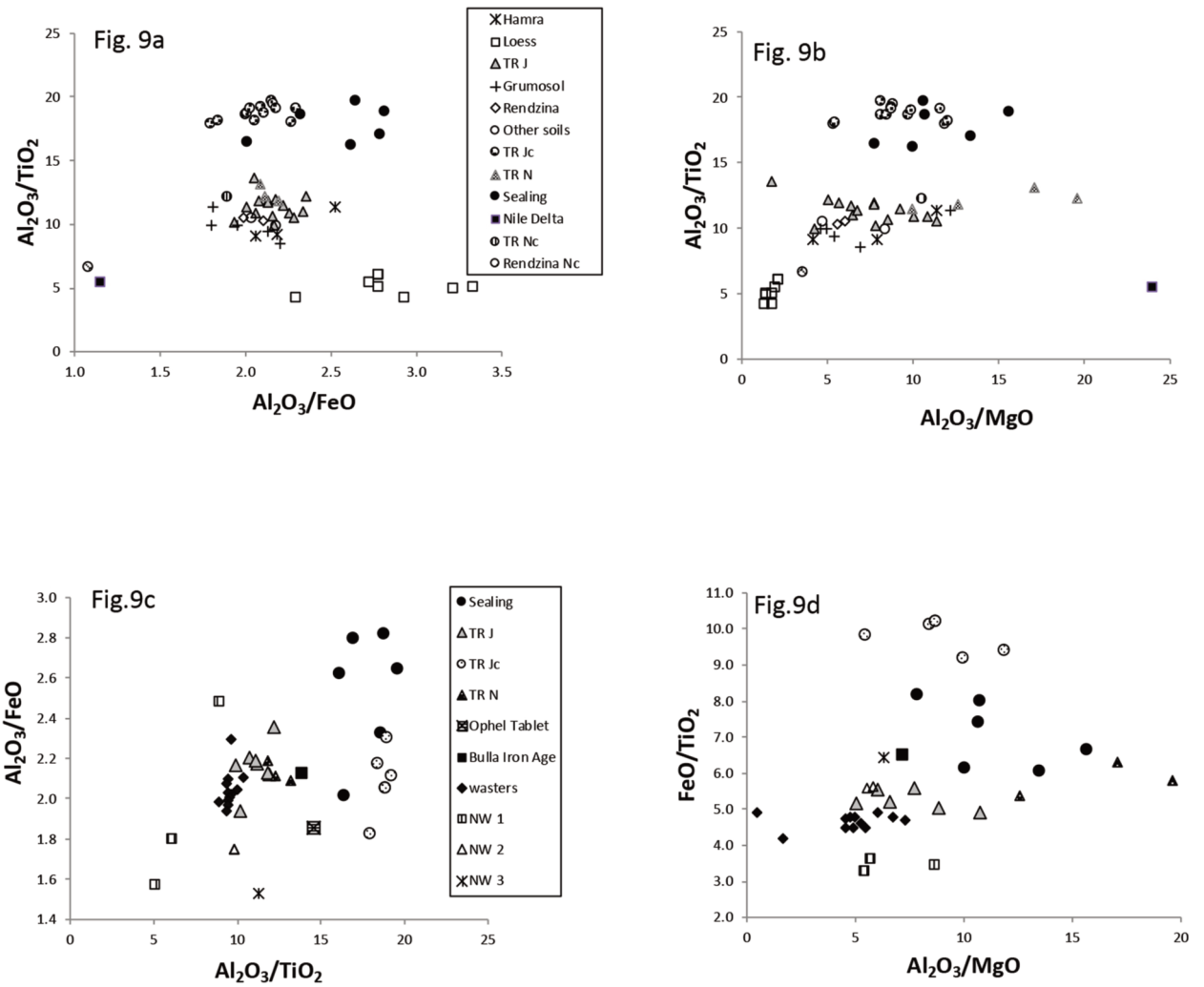

FIGURE 9: a, b: Al_2O_3/FeO versus Al_2O_3/ TiO_2 and Al_2O_3/MgO versus Al_2O_3/ TiO_2 in the sealing (this work) along with various common soils in Israel; TR = Terra Rossa, J= Judea, N= Northern Israel, c = clay fraction and "other soils" are vertisol, coluvial, and forest brown soil. Soil and clay data are from Ravikovich 1960; Dekov et al. 1997; Shoval et al. 2006; Singer 2007; Sandler 2013; Sandler et al. 2015; Ben-Israel et al. 2015; **c, d:** Al_2O_3/FeO versus Al_2O_3/ TiO_2 and Al_2O_3/MgO versus FeO/ TiO_2 ratios in various artefacts; Ophel Tablet (Mazar et al. 2010), wasters of loess-made vessels (Goren et al., 2004), NW = Nile ware 1 = Egypt (Porat et al. 1991), 2 = sherds from Saqqara (Hamdan et al. 2014) and 3 = cuneiform tablet (Goren et al. 2011).

these populations differ on a plot of Al_2O_3/MgO versus FeO/TiO_2 ratios (Fig. 9d). The data points of sealing B.19119 are similar to the Iron Age bulla and fall between the bulk and clay fraction of terra rossa soils (Fig. 9b). This may indicate that indeed the soil fraction that was used for the sealing is enriched in clay which may also explain the higher ratios (probably FeO) compare with the Iron Age bulla and the Ophel tablet. Note that no MgO are available for the Ophel tablet. Moreover, Egyptian clay tablets made of Nile sediments are known to be enriched in Ti and relatively low in alkali oxides (Na, K).[40] Indeed, the Nile-derived clay objects have much lower Al_2O_3/TiO_2 and higher Al_2O_3/K_2O ratios (not shown) than that in the current studied sealing (Table 1, Fig. 9). To conclude, the petrography and the chemical analyses indicate that the sealing was made of enriched clay fraction of the local Judea terra rossa soil, which is widely formed in the Judaea Mountains and the vicinity of Jerusalem.

Although terra rossa soils show heterogeneity with regard to clay mineral composition,[41] SEM-EDS analysis of the sealing shows that the clay composition is close to illite-smectite in accordance with the composition of some terra rossa soils that have illitic clay mineral composition (50–65%) in the vicinity of Jerusalem,[42] This in comparison to mineralogical studies of Nile sediments, which showed that smectite or smectite-illite clays are the dominant clay in the sediments[43] and not illite-smectite as for the sealing.

Discussion

Egyptian scarabs bearing titles and names of Egyptian officials became widely used in Egypt during the Middle Kingdom, under the reigns of the Twelfth and Thirteenth Dynasties.[44] More precisely, some private-name scarabs can be dated to the middle of the Thirteenth Dynasty based on their association with the "Sobekhotep group"—a class of royal-name scarabs that share certain characteristic features of design.[45] Although characterization of the Sobekhotep group relies on the features of the actual scarab seal and not on those of the impression, it is noteworthy that the joined scrolls border dominates the design of the plinth in this group.[46]

A stylistic division within the Sobekhotep group may also provide clues as to the original date of the stamping seal, since the earlier Sobekhotep scarabs are usually quite large, displaying an average length of 22–23 cm, while the later ones measure 18–20 cm.[47] The estimated size of the present sealing is more compatible with the latter group, dated to the reigns of Sobekhotep V, Ibiaw, and Ay.

However, the likely Thirteenth Dynasty date of the seal that stamped the present sealing is not necessarily also indicative of the date of the impression. Late Middle Kingdom sites at Kahun, Lisht, and Uronarti yielded many clay sealings bearing earlier Middle Kingdom designs attesting to the fact that "scarabs used for the sealings were not always contemporaneous with them."[48] The secondary use of private-name scarabs in Egyptian sites is further demonstrated by the fact that many of them included funerary epithets alongside the officials' name and title. This observation suggested to Ben-Tor[49] that the primary use of the scarab seals was funerary and only later were these scarabs robbed from the officials' tombs and traded as amulets or used as seals.

Similar practices were observed at the site of Tell el-Dabʿa in Lower Egypt, where Middle Kingdom seals remained in use during the Second Intermediate Period and even as late as the early Eighteenth Dynasty.[50] Likewise, Middle Kingdom scarab-impressions were also found in later Levantine contexts, such as on the textile sealing that sealed an Iron II silver hoard from Tel Dor[51] and on a LBA bowl from ʿYoqneʿam.[52]

Therefore, in many cases, a chronological gap existed between the lifetime of the official recorded on the private-name scarab and the archaeological deposition of the seal and/or its impression.

This chronological gap is also consistent with the distribution pattern of Egyptian private-name scarabs in Canaan, where the majority of the scarabs with known provenance originate from MB IIB–C tombs, e.g., post-Middle Kingdom contexts.[53] Among these is a private-name scarab of the official Seneb said to have been retrieved from a tomb in Jerusalem.[54]

Local Canaanite sealings impressed by scarabs of the Egyptian private-name genre are quite rare and include, besides the present example, an impression from an unknown context at Tell el-ʿAjjul,[55] a fragment from an Iron II context at Tell Jemmeh[56] and five sealings from the moat deposit at Ashkelon.[57] The Ashkelon moat deposit includes some 41 clay sealings that constitute the only assemblage in the Levant from an MBIIA context

that is contemporaneous with the Late Middle Kingdom in Egypt.[58]

The new finds from Ashkelon reopen the question regarding Egyptian interconnections with the Levant during the Middle Kingdom and the possible significance of Egyptian stamp seal impressions at Canaanite sites. Until recently, the paucity of Egyptian imports in MBIIA levels in the southern Levant suggested that no meaningful relations existed between the two regions during the Middle Kingdom.[59] The relatively larger share of Egyptian scarabs in MBIIB–C levels, together with the local production of Canaanite scarabs, suggested an intensification of Egypto-Levantine relations during the Second Intermediate Period.[60] This interpretation lies in odds with the textual evidence from Egypt—namely the execration texts—that disclose an intimate knowledge of ruling individuals and place names in the Levant from the mid-Twelfth Dynasty to the early Thirteenth Dynasty. As a result, various scholars have suggested that the execration texts reflect a reality that is either earlier[61] or later[62] than the MBIIA.

It seems however that the MBIIA period in the southern Levant was not entirely lacking in Egyptian finds.[63] The Ashkelon moat deposit, which included some imported Egyptian pottery,[64] now joins the Egyptian pottery from Tel Ifshar[65] and presents a case for some maritime relations between Middle Kingdom Egypt and Canaanite MBIIA coastal sites.

That Jerusalem existed as a site throughout the entire Middle Bronze Age is clear from pottery found and published and through a limited amount of ^{14}C dates.[66] Archaeological evidence for the relations between Egypt and Jerusalem during the MBA is however less conclusive and is largely limited to the retrieval of an assemblage of Egyptian and Egyptian-style scarabs and seal impressions. 45 bullae, 31 scarabs, 1 oval plaque, and 6 stamped jars were identified as MBA products by their designs and included in Keel's fifth volume.[67] Only 15 designs were considered to be Egyptian by origin, e.g., imported scarabs or impressions that were imprinted by them.[68] Of those, only two scarabs were found in contexts that were exclusively dated to the MBIIB,[69] while the rest were found in mixed or later dating contexts.

From the Egyptian end, petrographic studies further strengthen the impression that trade relations existed between the Egyptian Middle Kingdom and the southern Levant. Petrographic analysis of Levantine wares at Tell el-Dabʿa showed that ca. 20% of foreign pottery from the Middle Kingdom levels could be associated with the southern Levant.[70] This percentage consistently increased with the transition to the Thirteenth Dynasty and from the middle of the Thirteenth Dynasty, Levantine wares included south Canaanite clays, particularly from the northwestern Negev.[71]

Within this interregional framework, private-name seal impressions in Canaan may reflect some Egyptian administrative aspects, either carried directly with Egypt or as an adoption of Egyptian administrative practices.

Conclusions

The recently discovered sealing from the City of David carries the impression of an official of the late Thirteenth Dynasty. The late context of its retrieval along with the tendency of Egyptian private-name scarabs to appear in post Middle Kingdom contexts in Canaan even as late as the Iron Age, deny any conclusive statements on its use and purpose in MBA Jerusalem.

Nevertheless, while most private-name scarabs in Canaan were probably traded and used as amulets, the sealing from Jerusalem reflects a different practice. The local fabric of the clay attests to the fact that the sealing was stamped in Canaan to seal a box, therefore carrying some significance for local administration. The proposed reconstruction of the name and title of the elder of the portal, *Ypṯ-ḥr*, a Semitic name known from an Egyptian scarab, may further point to local administrative practices.

In light of recent finds from the coastal sites of Ashkelon and Tel Ifshar, locally stamped Egyptian sealings may come to signify some closer relations between Egypt and the southern Levant during the early stages of the MBA.

References

Arie, Eran, Yuval Goren, and Inbal Samet. 2011. "Indelible Impression: Petrographic Analysis of Judahite Bullae." In Finkelstein, Israel and Nadav Na'aman (eds.), *The Fire Signals of Lachish: Studies in the Archaeology and History of Israel in the Late Bronze Age, Iron Age, and Persian Period in Honor of David Ussishkin*, 1–16. Winona Lake, IN: Eisenbrauns.

Ariel, Donald T. 2000. *Excavations at the City of David*

1978–1985 Directed by Yigal Shiloh. Volume V: Extramural Areas. Qedem 40. Jerusalem: Israel Exploration Society.

Ben-Dor Evian, Shirly. 2017. "Execrating an Invisible City: Egypt and Jerusalem in the Middle Bronze Age." *New Studies in the Archaeology of Jerusalem* 11: 165–173 (Hebrew).

Ben-Israel, Michal, Yehuda Enzel, Rivka Amit, and Yigal Erel. 2015. "Provenance of the Various Grain-Size Fractions in the Negev Loess and Potential Changes in Major Dust Sources to the Eastern Mediterranean." *Quaternary Research* 83: 105–115.

Ben-Shlomo, David, and Othmar Keel. 2014. "Clay Sealings and Seal Impressions." In David Ben-Shlomo and Gus W. van Beek (eds.), *The Smithsonian Institution Excavation at Tell Jemmeh, Israel, 1970–1990*. Smithsonian Contribution to Anthropology 50, 857–875. Washington D.C.: Smithsonian Institution Scholarly Press.

Ben-Tor, Amnon. 2006. "Do the Execration Texts Reflect an Accurate Picture of the Contemporary Settlement Map of Palestine?" In Yairah Amit, Ehud Ben Zvi, Israel Finkelstein, and Oded Lipschits (eds.), *A Tribute to Nadav Na'aman: Essays on Ancient Israel in Its Near Eastern Context,* 63–87. Winona Lake: Eisenbrauns.

Ben-Tor, Daphna. 1988. "Scarabs bearing Titles and Private Names of Officials from the Middle Kingdom and the Second Intermediate Period (c. 2050–1550 BCE)." *The Israel Museum Journal* 7: 35–46

———. 1994. "The Historical Implications of Middle Kingdom Scarabs Found in Palestine Bearing Private Names and Titles of Officials." *Bulletin of the American Schools of Oriental Research* 294: 7–22.

———. 2005. "A Scarab Impression." In A. Ben-Tor, D. Ben-Ami, and A. Livneh (eds.), *Yoqne'am III: The Middle and Late Bronze Ages: Final Report of the Archaeological Excavations (1977–1988)*, 361–362. Qedem Reports 7. Jerusalem: Hebrew University of Jerusalem.

———. 2007. *Scarabs, Chronology, and Interconnections. Egypt and Palestine in the Second Intermediate Period*. Orbis Biblicus et Orientalis Series Archaeologica 27. Fribourg and Göttingen: Vandenhoeck and Ruprecht.

———. 2018. "Evidence for Middle Bronze Age Chronology and Synchronisms in the Levant: A Response to Höflmayer et al. 2016." *Bulletin of the American Schools of Oriental Research* 379(1): 43–54.

Ben-Tor, Daphna, and Lanny Bell. 2018. "Clay Sealings from the Moat Deposit." In Lawrence E. Stager, David J. Schloen, and Ross J. Voss (eds.), *Ashkelon* 6: *The Middle Bronze Age Ramparts and Gates of the North Slope and Later Fortifications,* 337–382. University Park, PA: Eisenbrauns.

Bietak, Manfred. 2004. "Seal Impressions from the Middle till the New Kingdom—A Problem for Chronological Research." In Manfred Bietak and Ernst Czerny (eds.), *Scarabs of the Second Millennium BC from Egypt, Nubia, Crete and the Levant: Chronological and Historical Implications,* 43–55. Vienna: Verlag der Österreichischen Akademic der Wissenschaften.

Brandl, Baruch. 1993. "Scarabs and Other Glyptic Finds." In Israel Finkelstein, Shlomo Bunimovitz and Zvi Lederman, *Shiloh: The Archaeology of a Biblical Site*, 203–222. Tel Aviv: Institute of Archaeology of Tel Aviv University, Publications Section.

———. 2009. "Scarabs, Seals, Sealings and Seal Impressions." In Nava Panitz-Cohen and Amihai Mazar (eds.), *Excavations at Tel Beth-Shean 1989–1996 Volume III: The 13th–11th century BCE Strata in Areas N and S,* 636–684. Jerusalem: Israel Exploration Society.

———. 2012. "Scarabs, Scaraboids, Other Stamp Seals, and Seal Impressions." In Alon De-Groot and Hannah Bernick-Greenberg (eds.), *Excavations at the City of David 1978–1985 Directed by Yigal Shiloh, Volume VIIB: Area E: The Finds*, 377–396. Qedem 54. Jerusalem: Israel Exploration Society.

———. 2013. "Tel Haror." In Othmar Keel, *Corpus der Stempelsiegel-Amulette aus Palästina/Israel*: *Von den Anfängen bis zur Perserzeit, Katalog*. IV. Von Tel Gamma bis Chirbet Husche. Mit Beiträgen von Baruch Brandl, Daphna Ben-Tor und Leonardo Pajarola, 572–581. OBO Series Archaeologica 33. Fribourg, Switzerland: Academic Press.

———. 2018. "Morphology and Function of the Sealings from the Moat Deposit." In Lawrence E. Stager, David J. Schloen and Ross J. Voss (eds.), *Ashkelon* 6: *The Middle Bronze Age Ramparts and Gates of the North Slope and Later Fortifications,* 383–426. University Park, PA: Eisenbrauns.

Brandl, Baruch, and Benjamin Sass. 1985. "Forgotten Scarabs with Names of Officials from

Canaan." *Zeitschrift des Deutschen Palästina-Vereins* 101(2): 111–113.

Cohen-Weinberger, Anat. 2008. *Petrography of Middle Bronze 2 Age Pottery: Implications to Understanding Egypto-Canaanite Relations*. Ph.D. dissertation, Tel Aviv University.

Cohen-Weinberger, Anat, and Yuval Goren. 2004. "Levantine-Egyptian Interactions during the 12th to the 15th Dynasties Based on the Petrography of the Canaanite Pottery from Tell el-Dab'a." *Egypt and the Levant* 14: 69–100.

Dekov, M. Vesselin, Maria Fátima Araújo, Zanatry, R. Komy, and Annick Van Put. 1997. "Chemical Composition of Sediments, Suspended Matter, River Water and Ground Water of the Nile (Aswan-Sohag Traverse)." *Science of The Total Environment* 201(3): 195–210.

Dijkstra, Meindert. 1998. "The Element -Hr in Egypto-Semitic Names." *Biblische Notizen* 94: 5–10.

Farragallah, Mohamed. El-Ameen. and Mahmoud A. Essa, 2011. "Sand and Clay Mineralogical Composition in Relation to Origin, Sedimentation Regime, Uniformity, and Weathering Rate of Nile Terrace soils at Assiut, Egypt." *Australian Journal of Basic and Applied Sciences* 5(10): 239–256.

Gadot, Yuval. 2014. "Preliminary Report on the Excavations at Jerusalem's Southeastern Hill, Area D3." *Hebrew Bible and Ancient Israel* 3(2): 279–292.

Gadot, Yuval. 2018. "Jerusalem and the Holly Landfill." *Biblical Archaeology Review* 44(1): 36–45.

Gadot, Yuval, Yuval Goren, and Oded Lipschits. 2013. "A 7th Century BCE Bulla Fragment from Area D3 in the 'City of David'/Silwan." *Journal of Hebrew Scriptures* 13: 1–10.

Goren, Yuval, Israel Finkelstein and Nadav Na'aman. 2004. *Inscribed in Clay: Provenance Study of the Amarna Letters and Other Ancient Near Eastern Texts*. Sonia and Marco Nadler Institute of Archaeology Monograph Series 23. Tel Aviv: Tel Aviv University.

Goren, Yuval, Hans Mommsen, and Jörg Klinger. 2011. "Non-Destructive Provenance Study of Cuneiform Tablets Using Portable X-Ray Fluorescence (pXRF)." *Journal of Archaeological Science* 38(11): 684–696.

Goren, Yuval and Shira Gurwin. 2013. "Royal Delicacy: Material Study of Iron Age Bullae from Jerusalem." *The Old Potter's Almanack* 18(2): 2–9.

Goren, Yuval, Shira Gurwin, and Eran Arie. 2014. "Messages Impressed in Clay: Scientific Study of Iron Age Judahite Bullae from Jerusalem." In Marcos Martinón-Torres (ed.), *Craft and Science: International Perspectives on Archaeological Ceramics*, 143–149. UCL Qatar Series in Archaeology and Cultural Heritage,. Doha, Qatar: Bloomsbury Qatar Foundation.

De-Groot, Alon. 2012. "Discussion and Conclusions". In Alon De-Groot and Hannah Bernick-Greenberg (eds.), *Excavations at the City of David 1978–1985 Directed by Yigal Shiloh, Volume VIIA: Area E: Stratigraphy and Architecture*, 141–184. Qedem 53. Jerusalem: Israel Exploration Society.

———, and Hannah Bernick-Greenberg. 2012. *Excavations at the City of David 1978–1985 Directed by Yigal Shiloh. Volume VIIA: Area E: Stratigraphy and Architecture. Text.* Qedem 53. Jerusalem: Israel Exploration Society.

Hamdan, Mohamad.A, Salvador Manent Martinez, Maite Garcia Vallès, Joaquim Maria Nogués, Fekri A Hassan, Roger. J. Flower, Mohamed Aly Ashraf Senussi, and E. S. Ebrahim. 2014. "Ancient Egyptian Pottery from the Subsurface Floodplain of the Saqqara-Memphis Area: Its Mineralogical and Geochemical Implications." *Archaeometry* 56(6): 987–1008.

Hayes, William C. 1990. *The Scepter of Egypt: A Background for the Study of Egyptian Antiquities in The Metropolitan Museum of Art Part I: From the Earliest Times to the End of the Middle Kingdom. New York: Metropolitan Museum of Art*, 5th revised printing. New York: Metropolitan Museum of Art and H. N. Abrams.

Höflmayer, Felix, Jenes Kamlah, Hélène Sader, Michael W. Dee, Walter Kutschera, Eva Maria Wild, and Simone Riehl. 2016. "New Evidence for Middle Bronze Age Chronology and Synchronisms in the Levant: Radiocarbon Dates from Tell el-Burak, Tell el-Dabaa, and Tel Ifshar compared." *Bulletin of the American Schools of Oriental Research* 375: 53–76.

Keel, Othmar. 1995. *Corpus der Stempelsiegel-Amulette aus Palastina/Israel, von den Anfangen bis zur Perserzeit: Einleitung* (Orbis Biblicus et Orientalis Series Archaeologica 10). Fribourg, Switzerland: Academic Press.

———. 1997. *Corpus der Stempelsiegel-Amulette aus*

Palästina/Israel. Von den Anfängen bis zur Perserzeit. Katalog: Band 1: Orbis Biblicus et Orientalis Series Archaeologica 13. Fribourg, Switzerland: Academic Press.

———. 2010 . *Corpus der Stempelsiegel-Amulette aus Palästina/Israel. Von den Anfängen bis zur Perserzeit: Band 2: Von Bahan bis Tel Eton. Mit Beiträgen von D. Ben-Tor/B. Brandl/R. Wenning*. Orbis Biblicus et Orientalis Series Archaeologica 29. Fribourg, Switzerland: Academic Press.

———. 2017. *Corpus der Stempelsiegel-Amulette aus Palästina/Israel. Von den Anfängen bis zur Perserzeit: Band 5: Von Tel el-'Idham bis Tel Kitan. Mit Beiträgen von D. Ben-Tor/B. Brandl/S. Münger/L. Pajarola*. Orbis Biblicus et Orientalis Series Archaeologica 35. Fribourg, Switzerland: Academic Press.

Maeir, M. Aren. 2017. "Assessing Jerusalem in the Middle Bronze Age: A 2017 Perspective." In Yuval Gadot, Yehiel Zelinger, Katia Cytryn-Silverman, and Yosef (Joe) Uziel (eds.), *New Studies in the Archaeology of Jerusalem and its Region: Collected Papers* Vol. XI: 64*–74. Jerusalem: Yerushalayim Reshut ha-'Atiḳot.

Marcus, Ezra S., Yosef Porat, Robert Schiestl, Anne Seiler, and Samuel M. Paley. 2008. "The Middle Kingdom Egyptian Pottery from Middle Bronze Age IIa Tel Ifshar." *Egypt and the Levant* 18: 203–220.

Martin, Geoffrey T. 1971. *Egyptian Administrative and Private-Name Seals, Principally from the Middle Kingdom and Second Intermediate Period*. Oxford: Griffith Institute.

Mazar, Eilat, Wayne Horowitz, Takayoshi Oshima, and Yuval Goren. 2010. "A Cuneiform Tablet from the Ophel in Jerusalem." *Israel Exploration Journal* 60: 4–21.

Porat, Naomi, Joseph Yellin, Lisa Heller-Kallai, and Ludwik Halicz. 1991. "Correlation between Petrography, NAA, and ICP Analyses: Application to Early Bronze Egyptian pottery from Canaan." *Geoarchaeology* 6(2): 133–149.

Quinn, Patrick, S. 2013. *Ceramic Petrography: The Interpretation of Archaeological Pottery and Related Artefacts in Thin Sections*. Oxford: Archaeopress.

Ranke, Hermann. 1935. *Die Ägyptischen Personennamen*. Glückstadt: Augustin.

Ravikovitch, Shlomo, 1960. *Soils of Israel: Classification of Soils of Israel*. Jerusalem: Faculty of Agriculture, Hebrew University.

Regev, Johannah, Joe Uziel, Nahshon Szanton, and Elisabetta Boaretto. 2017. "Absolute Dating of the Gihon Spring Fortifications, Jerusalem," *Radiocarbon* 59: 1171–1193.

Sandler, Amir. 2013. "Clay Distribution Over the Landscape of Israel: From the Hyper-Arid to the Mediterranean Climate Regimes." *Catena* 110: 119-132.

Sandler, Amir, Alain Meunier, and Bruce Velde. 2015. "Mineralogical and Chemical Variability of Mountain Red/Brown Mediterranean Soils." *Geoderma* 239: 156–167.

Schneider, Thomas. 2003. *Ausländer in Ägypten während des Mittleren Reiches und der Hyksoszeit*. Vol. 2, *Die ausländische Bevölkerung*. Ägypten und Altes Testament 42. Wiesbaden: Harrassowitz.

Schneiderman, Jill S. 1995. "Detrital Opaque Oxides as Provenance Indicators in River Nile Sediments." *Journal of Sedimentary Research* 65: 668–674.

Shoval, Shlomo, Pirhiyah Beck and Esther Yadin. 2006. "The Ceramic Technology Used in the Manufacture of Iron Age Pottery from Galilee." In Marino Maggetti and Bruno Mesiga (eds.), *Geomaterials in Cultural Heritage*, 101–117. Geological Society Special Publications 257. London: Geological Society.

Singer, Arieh. 2007. *The Soils of Israel*. Rehovot: Springer.

Stager, Lawrence E., and Ross J. Voss. 2018. "Egyptian Pottery Found in Middle Bronze Age Ashkelon." In Lawrence E. Stager, David J. Schloen, and Ross J. Voss (eds.), *Ashkelon* 6: *The Middle Bronze Age Ramparts and Gates of the North Slope and Later Fortifications,* 237–244. University Park, PA: Eisenbrauns.

Streit, Katharina. 2017. "A Maximalist Interpretation of the Execration Texts—Archaeological and Historical Implications of a High Chronology." *Journal of Ancient Egyptian Interconnections* 13: 59–69.

Takla, M.A., and Arafa, E.H. 1975. "The Mineralogy of the Sand Dunes between Minya and Dairut, Egypt." *Mineralogy and Petrology* 22: 164–173.

Tufnell, Olga. 1984. *Studies on Scarab Seals Vol. 2: Scarab Seals and Their Contribution to History in the early Second Millennium B.C*. Warminster: Aris and Phillips.

Ward, William A. 1982. *Index of Egyptian Administrative and Religious Titles of the Middle Kingdom*. Beirut: American University of Beirut.

Weinstein, James M. 1975. "Egyptian Relations with

Palestine in the Middle Kingdom." *Bulletin of the American Schools of Oriental Research* 217: 1–16.

Weir, A.H., Ormerod, C., and El Mansey, I. M. I. 1975. "Clay Mineralogy of Sediments of the Western Nile Delta." *Clay Minerals* 10: 369–386.

Wieder, Moshe, and David Adan-Bayewitz. 2002. "Soil Parent Materials and the Pottery of Roman Galilee: A Comparative Study." *Geoarchaeology* 17(4): 393–415.

Yaalon, Dan Hardy, and Eliezer Ganor. 1973. "The Influence of Dust on Soils during the Quaternary." *Soil Science* 116 (3): 146–155.

Notes

1 Ariel 2000.

2 Gadot 2014. The excavations were directed by Yuval Gadot on behalf of the Sonia and Marco Institute of Archaeology at Tel-Aviv University and the Israel Antiquities Authority (license numbers G-4/2013 and G-19/2014). The excavation team included: H. Machline and Sara Hirshberg (area supervisors), O. Moshevich (wet-sifting supervisor), N. Nehama and R. Abu-Halaf (administration), A. Peretz (photography), V. Essman and Y. Shmidov (surveying and drafting), and S. 'Adalah (metal detection).

3 Gadot 2014; Gadot 2018.

4 de Groot and Bernick-Greenberg 2012, 106–123.

5 Martin 1971, pl. 48—base type j.

6 Tufnell 1984, 129; Keel 1995, §508.

7 Martin 1971; Ben-Tor 1988.

8 Ben-Tor 1994.

9 Ward 1982, nos. 1305–1313; Ben-Tor 1988, no. 17.

10 See, for example, a scarab from Beth Shemesh, Brandl and Sass 1985, fig, 1c; Keel 2010, no. 88; Ben-Tor 1994, App. A, no. 53.

11 Martin 1971, no. 304, pl. 11: 12; Ranke 1935, II, 268, 27.

12 Martin 1971, no. 429, pl. 13: 15. The authors are indebted to Daphna Ben-Tor for proposing these two parallels.

13 Schneider 2003, 135; Dijkstra 1998. The authors wish to thank Alexander Ilin-Tomich for pointing out the Semitic aspect of the name.

14 Ward 1982, no. 1.

15 Ben-Tor 1994, Appendix A no. 10 = Keel 1997, 517, no. 1218.

16 IMJ 76.31.2687, Ben-Tor 1988, 39, no. 9.

17 Ward 1982, no. 1140.

18 Ben-Tor 1994, Appendix A: no. 54.

19 Ward 1982, no. 1306.

20 Ben-Tor 1994, App. A: 4, 28, 31, 37, 50, 58, 65 and many others in Appendices B and C.

21 The authors wish to thank Daphna Ben-Tor, Wolfram Grajetzki and Alexander Ilin-Tomich for kindly agreeing to review the present sealing.

22 Cf. Brandl 2018, 384.

23 Brandl 1993, 209–210 (no. 6); 2009, 657–658 (no. 25); 2013, 574–575 (no. 5); 2018 385–387, 391–395, 423–424.

24 Hayes 1990, 245–246, fig. 157.

25 Brandl 2018, 393, fig. 13.3.

26 Brandl 2018, 385–387, 391–395, 423–424.

27 Cohen-Weinberger 2008, 12, no. 5; Yuval Goren personal communication 2006.

28 Brandl 2018, 388, 412–414, figs. 13.29–30b.

29 For details about petrography of archaeological artefacts see, e.g., Quinn 2013.

30 E.g., Yaalon and Ganor 1973; Wieder and Adan-Bayewitz 2002, 395.

31 Singer 2007, 98, 103–104.

32 E.g., Goren et al. 2014, 146.

33 Singer 2007, 96–97, table 4.2.2–4.

34 See, e.g., Porat et al. 1991:137

35 This bulla is from the excavations in the eastern slopes of the City of David that were carried out by Joe Uziel and Nahshon Szanton on behalf of the Israel Antiquities Authority, not yet published. All the previously examined bullae from Jerusalem are dated to the Iron Age and were made of terra rossa soil (e.g., Arie et al. 2011; Gadot et al. 2013; Goren et al. 2014).

36 Mazar et al. 2010.

37 Porat et al. 1991; Goren et al. 2004; Goren et al. 2011; Hamdan et al. 2014

38 Goren et al. 2004, table 2.

39 Singer 2007, 96; Sandler et al. 2015.

40 Takla and Arafa 1975; Schneiderman 1995; Goren 2011; Hamdan et al. 2013.

41 Singer 2007, 98; Sandler et al. 2015.

42 Sandler 2013.

43 E.g., Weir et al. 1975; Farragallah and Essa 2011.

44 Martin 1971; Ben-Tor 1994.

45 Ben-Tor 2007, 38–39, with previous literature.

46 Ben-Tor 2007, 39–40.

47 Ben-Tor 2007, 39.

48 Ben-Tor 1994, 8–9 and Appendix B there.

49 Ben-Tor 1994.

50 Bietak 2004.

51 Keel 2010, 468–469, no. 15.

52 Ben-Tor 2005.

53 Ben-Tor 1994, Appendix A.

54 Brandl and Sass 1985, fig. 1a.

55 Giveon 1985, 108–109, no. 138 = Keel 1997, 517, no. 1218.

56 Ben-Shlomo and Keel 2014, 869, fig. 20.5f.

57 Ben-Tor and Bell 2018, nos. 8, 15, 17a,17b, 19. Three of door locks, one of a jug, and one of Egyptian imported stone vessel, Brandl 2018: 385 table 13.1.

58 A recent study proposed to correlate the MBIIA with the earlier phases of the Middle Kingdom, namely to the Twelfth Dynasty (Höflmayer et al. 2016). This suggestion raises several stratigraphical problems, particularly in Ashkelon (Ben-Tor 2018). Until such issues are resolved we adhere here to the traditional dating.

59 Weinstein 1975.

60 Ben-Tor 2007.

61 Ben-Tor 2006, with references.

62 Streit 2017.

63 Ben-Dor Evian 2017.

64 Stager and Voss 2018.

65 Marcus et al. 2008.

66 De-Groot 2012; Regev *et al*. 2016; Maeir 2017

67 Keel 2017.

68 Keel 2017: nos. 8, 15, 20(?), 48, 136, 138, 139, 140–142, 347, 358, 400, 402, 403.

69 Keel 2017: no. 48 is a Second Intermediate Period imported scarab found during the excavations by Shiloh on an MBIIB floor in Stratum 17A (Brandl however, considers the scarab to be of local, Canaanite production; see Brandl 2012, 379–380, with further reasoning); no. 136 is a late Middle Kingdom scarab retrieved from an MBIIB burial in Tomb 112 at the site of Holyland.

70 Cohen-Weinberger and Goren 2004.

71 Cohen-Weinberger and Goren 2004, 81.