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NABATAEANS IN THE EILAT REGION, THE HINTERLAND OF AILA

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Abstract
Nabataean archaeology is well known in southern Jordan, but in the neighboring southern Negev, Nabataean remains attracted less attention. This paper attempts to draw a general, but new view of the Nabataean presence in the region and their activities, including farming, herding, copper industry, trade and others. Their settlement in the region began before the establishment of the city of Aila and continued long after the annexation of their kingdom to the Roman Empire in 106 AD. Studying the remains in the region, the hinterland of Aila, also sheds new light on the position of the city.

INTRODUCTION

The Eilat region is defined here as the southern ‘Arabah Valley and the Eilat Mountains, some 55 km north of the Gulf of Eilat (Gulf of Aqaba). The area is hyper-arid, with an annual average rainfall of only 20 mm, an annual potential evaporation rate of 3600 mm, and summer mid-day temperatures of 40ºC or higher. As a result, perennial water sources are rare, the vegetation is restricted to wadi beds, and the carrying capacity for animal and man is low. The region’s landscape varies and changes abruptly, with mountains up to 892 m above sea level, cliffs and canyons, some broad valleys, the deep Arava Valley and the Gulf shores. The lithology diverse and colourful, with igneous and metamorphic rocks, sandstone and limestone formations. Against all expectations based on environmental conditions, the region is rich with ancient sites, from prehistory to present, with a full sequence of human presence and activity during the last 10,000 years. Presently, over 3000 ancient sites are recorded in the region, although only some 30% of it has been systematically surveyed. The variety of types of sites and the good state of preservation allow studying some themes better than in other regions, such as the beginning of desert agriculture (*ca*. 6000 BC), the early formation of a desert religion (ca. 7000), the beginning of metallurgy (*ca*. 4500 BC) as well as later developments.[1]

Ample Nabataean archaeological remains and inscriptions are known in southern Jordan, primarily from the Petra area;[2] important Nabataean remains were also uncovered in the excavation of Aila, in ‘Aqaba. In the Negev Highlands, a vast agricultural system based on terracing the wadis, was attributed in the past to the Nabataeans (*e.g*. Even-Ari *et al*. 1971), but presently, the Negev terraces are mainly dated to the Byzantine and Early Islamic Period. (Haiman 1995; Avni *et al*. 2012; Erickson-Gini 2012a). The Negev towns mainly developed during the Roman and Byzantine periods, while in the Nabataean kingdom time they were probably only small settlements, with caravan stations and religious centers (Erickson-Gini 2014, *passim*). Indications of Nabataean life in Sinai are also known. In 1907, 2742 Nabataean inscriptions were included in Volume II (1-3) of the *Corpus Inscriptionum Semiticarum* (*CIS*); hundreds were later added by Negev (1977) and by Stone (1992a,b, 1994). Archaeological remains and written sources add vital information about Nabataean settlement and organization in Sinai (Avner 2015 with references).

The main aspects of Nabataean life in the Eilat region are addressed here, including farming and herding, copper mining and production, trade and military, religion and others. The article focuses on the western side of the southern ‘Arabah and the Eilat mountains, but includes Aila (For Nabataean sites on the eastern, Jordanian side see *e.g*. Raikes 1976; Lindner *et al*. 2000; Smith 2005, 2010). The peoples behind these activities are termed here Nabataeans, but it should be born in mind that this title actually encompass

[1] See *e.g*. Avner 2002, 2018 and further references below.

[2] *E.g*. Brünnow und Domaszewski. 1909; Dalman 1908, 1912; Hammond 1996; Bigansca *et al*. 1996; Joukowsky- 2002; Lindner *et al*. 2000; Graweher 2010; Nehmé 2014.

various ethnic groups that joined the Nabataean polity or gathered under the their cultural "umbrella" (Graf 2004; 2007:182), not all were 'Arabs in origin.[3] The remains described below are attributed to the Nabataeans, even during the Roman and Byzantine periods, long after the cease of their kingdom. The Nabataeans seem to be the dominant element in the region, so the term "Nabataean period" also includes here the 2nd to 6th centuries AD (see discussion below). Sites mentioned in the text are shown on the maps (Figs. 1, 36). The purpose of this paper is to collect and analyze the presently available data, examine the relationship of these remains with the Nabataeans Aila and show the potential of further research.

NABATAEAN AILA

Excavations at 'Aqaba exposed Nabataean mud-brick buildings in limited areas, but many artifacts, mainly, Nabataean pottery and coins, beginning in the last third of the 1st century BC, the time of King 'Abdat (Obodas) III (Parker 2013) that now should be called 'Abdat II.[4] However, Nabataean settlement, or at least presence, at the head of the Gulf of 'Aqaba, probably began before the establishment of Aila. At Tell el-Kheleifeh, 3 km NW of 'Aqaba, imported artifacts of the Persian Period were found (5th-4th centuries BC), including Attic pottery (Glueck 1939:3). Two stamped Rhodian jar handles were also found (*ca*. 200 BC, Pratico 1993:62, Pl. 84c; Parker 2013:685). Glueck (*ibid*) also mentioned Nabataean pottery sherds, and at least one name mentioned in the Tel el-Kheleifeh ostraca seems Nabataean- 'Amiru.[5] These finds may represent a continuation of settlement in the site after the Persian Period (Glueck's Period 5) and its engagement in international trade, similar to the situation at Petra (Graf 2013) and Madâ'in Saliḥ.[6] Ancient writers support this possibility. Diodorus (3.43.4-5) and Strabo (16.4.18) described the Nabataeans as pirates, who attacked Egyptian merchant ships.[7] This is probably how it seemed in an Egyptians eye, but it could well reflect a competition between the two regarding the Red Sea trade. The events are related to the time of Ptolemy, most probably the second, *i.e*. early 3rd century BC.[8] In connection with these events, Diodorus also mentioned many Nabataean villages along the coast of the *Laeanites* Gulf, so a settlement at the head of the Gulf of 'Aqaba in the early 3rd century BC is quite possible. Commonly, this period is considered still in the "protohistory" of the Nabataeans, but the fact that the earliest Nabataeans coins were over-struck on early Ptolemaic issues (Barkay 2011, 2015), indicate that at that time the Nabataeans had already announced independence and power by the very act of minting. Several other discoveries support the view of an early establishment of the Nabataean kingdom (Graf 2006, Barkai *ibidem*).[9]

In the late 1st century BC or early 1st century AD, Aila was mentioned by Strabo as a "city" (*polis,* 16.2.30, 16,4.4). The same title was given to the place less than a century later by Pliny (5.12.65) and by Josephus (*A.J*. 8:163). Nabataean buildings and artifacts were excavated mainly in the northern end of the site, in Areas B, M and O. (Parker 2002:421-427, 2013; Retzleff 2003; Dolinka 2003). The earliest phase in the site was termed by the excavators "Early Roman/Nabataean" (late 1st century BC to early 2nd century AD), but since Rome only annexed the Nabataean kingdom in 106 AD, this phase should be better termed "Nabataean". Evidence of Nabataeans was retrieved from limited excavated areas (the entire excavated area is less than 1% of the ancient city, Parker 2007:365), so they cannot indicate the true nature

[3] For assimilation of autochtonic population of Sinai in the Nabataeans culture see Starcky 1979:38; Avner 2015:405-6.

[4] Many publications refer to Obodas III (30-9 BC). However, the former Obodas II, who was thought to have a sort reign (59-62 BC) is now canceled, based on a new analysis of Nabataean coins (Barkai 2016) and on the lack of epigraphic evidence.

[5] The name, **עמירו**, is incised on a jar in an Edomite script (DiVito, in Pratico 1993:57-8, Pl. 80a), based on the shape of 'מ', but the suffix ('ו') is common in many Nabataean names. Although this form of the name is unknown elsewhere, it is known in the forms of **עמריו**, **עמרו** end **עמירן** (Negev 1991:52-3). Glueck (1939:4) did not see Nabataean continuation at Tell el-Kheleifeh but described Aila as continuing the settlement of the Tell.

[6] The Hellenistic and Pre-Hellenistic periods are often mentioned in the excavation reports of Madâ'in Saliḥ (Hegra). See *esp*, Nehmé *et al*. 2017:84-104. Radiocarbon dates from the site begin in the late 5th century BC. (Rohmer and. Charloux. 2015:306-8).

[7] See a later similar event- Dio Cassius 51.7.1.

[8] In Book III, Diodorus often addressed the time of Ptolemy (*e.g*. 3.41.1, 42.1) and in 44.5 he wrote that the 'Arabs (known as Nabataeans, 43.4), plundered ships and shipwrecks "*when the kings in Alexandria had made the ways of the sea navigable for the merchants*". This also hints at a beginning of sea trade, *i.e*. by Ptolemy I or II.

[9] The "Millan Papyri", mentioning the "*Nabataean king of 'Arabian horsemen*" (AB 10, Lines 15-16) are copies of the late 3rd century BC, but their safe relation to Posidippus date their origin in the early 3rd century, the time of Ptolemy II (Graf 2006:3-5, with references).

of the site, but if Aila was indeed a city at the time of Strabo, it means that some settlement existed there before.[10]

The marine connections of Aila require some discussion. On one hand, the prevailing northern wind in the Gulf of 'Aqaba and the northern part of the Red Sea makes sailing northward very difficult (*e.g.* Facey 2004). Some scholars concluded that because of the environmental conditions, Aila could not compete with Egypt's marine trade, excepting short periods in history, and therefore gained almost no economic importance (Karmon 1968). On the other hand, there is enough evidence that points to the important position of Aila in Marine trade. One is the finds from the excavations of Aila, indicating both exports and imports (see below). Second is the existence of a seaport, and a Nabataean centurion fort at Leuke Kome, on the Red Sea shore, taxing ships coming from 'Arabia (*Periplus* 6.18, Casson 1989:61-2).[11] Since Leuke Kome was also the beginning of a land road to Petra (Strabo 16.4.23), it could be claimed that ships only reached this port but did not continue sailing northward to Aila. However, the location of a large Nabataean fortress at Dhahab, *ca.* 150 km south of Aila on the Sinai coast, next to a natural harbor, (Meshel 2000) attests otherwise. These two sites illuminate two other issues. One is the Nabataean "piracy" in the Red Sea, mentioned above, implying that Nabataean navigation in the Red Sea was a reality. Their ships could have sailed against the wind (probably with a triangular sail that could be quickly turned). Second is the later written sources, clearly speaking of marine trade reaching Aila, and even ships that belonged to the city.[12] Combining the evidence makes the ship traffic to Aila possible in the Nabataean period. The marine connection of Aila has implications on the city's links with land trade routes, as we shall see below.

The finds from the limited excavated areas at Aila are actually impressive: Large amounts of Nabataean pottery and large amounts of pottery slag and waste (Parker 2000:375; 2002:411-12, 422;-3, 2007:361-3). These indicate a pottery industry, beginning in the late 1st or early 2nd century AD, which later developed to the "'Aqaba Ware" (Dolinka 2003). This industry included the production of jars which are later called the "Aqaba Amphorae", used for exporting wine, olive oil or *garum*, that reached several ports along the Red Sea shore, as well as Turkey (Dolinka 2003:95-6, 2013:79-90; Tomber 2004). In addition, a vast scatter of copper slag indicates intensive metal industry, with a total of over 500 copper objects (Parker 2006:228; Power 2012:29; Dolinka 2003:95) or even several thousand copper artifacts (Parker 2007:363, including the Late Roman and Byzantine periods). Also Imported objects reached Aila, from the western Mediterranean, the Levant, Egypt and India (Parker 2002:422-7; Retzleff 2003:61-3). Interestingly, sherds of Eastern Sigillata, produced in northern Syria, greatly outnumber those found at Petra (Schmidt 2005:98-9).

Excavation in the northern part of Aila showed a short gap in settlement in the early 2nd century (Parker 2002:426). This somewhat recalls the words of Ptolemy (5.17.1; Berggren & Jones 2000) later in that century, mentioning Aila as a 'village' (*kome*). However, the finds from the excavations indicate a quick revival, beginning with the Roman annexation of the Nabataean kingdom (Parker, *ibid*). Aila continued as a Late Roman and Byzantine city, surrounded by a defensive wall, a city that also continued into the early Islamic Period (Parker, *ibid*; Whitcomb 1998, 1994, 1998). Most probably, a large part of its population in these later times was still Nabataean in origin.[13]

[10] The earliest Nabataean finds at Aila are coins of Aretas III (84-71 BC) and Malichus I (60-30 BC, Parker 2013:686). However, the coins alone cannot indicate establishment of the city in the 1st half of 1st century BC since coins can be used decades after their minting.

[11] There is a long debate on the location of Leuke Kome, but now it becomes safer to identify it with 'Aynuna, as a result of the Polish project in the site (Juchniewicz 2017, with references to the other suggestions.

[12] Eusebius, *Onomasticon* 6.17; Hieronimus, *Onomasticon* 7. 25-28; Marcian, *Periplus* 1.9; Cosmas Indicopleustes II 54; Procopius, *Wars* 1.19.2-3, 19-20; Simon of Arsham 8; Thimotheus of Gaza, *De Animal* 15. For the Greek and Latin texts, with English translations and references see Di Segni *et al*. 2017:212-253.

[13] This point is based on finds from the Negev and Sinai. Many names on Late Roman-Byzantine epitaphs written in Greek are actually Nabataean or other 'Arabs (Negev 1978 *passim*, 1981:84-8, 130-6, 1991:130-136. Tzafrir 1988, Nos. 9, 14, 20, etc. and Pp. 184-5; Ustinova & Figueras 1996; Kirk & Gignoux 1996, Nos. 3, 8, 15 *etc*.). Often, the deceased bears an European name but Nabataean father's name, which means that pure European names can also represent sometimes Nabataean persons. The vast majority of excavated skeletons from the Byzantine Negev and Sinai were identified as local-'Arabians (Hershkovitz *et al*. 1988; Nagar & Sonntag 2008). However, during the Byzantine Period many foreigners lived in Aila, from Persia, Mesopotamia, Turkey, the Levant and Egypt (Perry *et al*. 2017). This, in turn, emphasizes the broad commercial connections of Aila.

NABATAEAN KILN IN NAḤAL SHEḤORET

Three kilns are known in the Eilat region, none was excavated and the date of two is presently unclear. A large isolated kiln is built inside Naḥal Sheḥoret, *ca*. 9 km NNW of Eilat and 15 km NW of Aila. The kiln is stone-built, its inner dimensions are 2.9-3.2 m, almost identical to the largest, Kiln I, at az-Zurraba near Petra (Zayadin 1982:380-81; 'Amar 1999).[14] Its present depth (with debris) is 2.5 m (Figs. 2 a, b), but debris inside and around the kiln show that its dome was originally at least 1.5 m higher. A step all around the inner wall and two openings in different levels indicate it was a two-cell kiln: a lower opening of the combustion cell on the southern side, and a higher one of the pottery cell on the NW. No pottery refuse is discernible near the kiln, only some pottery slag and small clay chunks. A few Nabataean and Early Islamic pottery sherds were collected around the kiln. A radiocarbon date from the top of an ash dump next to the kiln was *ca*. 215 AD,[15] a date concurrent with the end of production of the Nabataean 'Aqaba-Ware' in the early 3rd century AD (*e.g*. Dolinka 2006b:182-5). The isolated location of the kiln is intriguing, since much firewood and water should be carried to the site, which is not easily accessible. Transportation of the products out of the wadi is not easy as well. Several nearby clay exposures of the 'Orah Formation' may provide some explanation for its location.

As mentioned above, large amounts of pottery waste and slag were found at Aila, but to date, no remains of Nabataean-Roman kilns. Therefore, excavation of the Naḥal Sheḥoret Kiln and further radiocarbon dates may contribute information relevant to the pottery industry of the Nabataean Aila.

NABATAEAN COPPER INDUSTRY

TIMNA VALLEY

Little was known about the Nabataean copper industry in the 'Araba, until recently. In Timna Valley, 25 km north of Eilat, copper mines are presently dated mainly to the Late Bronze-Iron Age,[16] while scatters of Nabataean pottery were found on surface in three locations. One mine outside the valley, with a vertical shaft and galleries, is certainly Nabataean. Its date is based on ample pottery sherds found next to it, including an oil lamp and lamp fragments (Fig. 3) produced in Petra after the 363 AD earthquake.[17]

One indication for Nabataean activity in Timna has been found in the copper smelting furnace of Site 39a. The furnace remains were dated as Chalcolithic, 5th-4th millennia BC (Rothenberg 1999:81-2; Rothenberg & Merkel 1998), however, a radiocarbon date from inside the furnace was *ca*. 50 AD.[18] Rothenberg (1990) argued for a secondary use of the furnace in this later period, an argument that found confirmation by a paleo-magnetic dating of the slag by Ben-Yosef *et al*. (2008:2873-5). This study found three different periods of production in the slag, based on differences in magnetic intensity: Chalcolithic, Iron Age I and Roman. If the radiocarbon date represents the latest use of the furnace, it indicates a Nabataean copper smelting, not Roman, which reached the region only about 50 years later.

Two rock inscriptions also indicate late Nabataean activity in the valley. One published by A. Shalit as a Roman inscription (in Rothenberg 1967:233-4, Pl. 72, here Fig. 4**),** but, it should be seen as Nabataean. At the top-left is an engraving of an eagle holding a wrath in its beak. The eagle is well known in Nabataean art, *e.g*. at Kh. Tannur (Glueck 1966: Pl. 140), at Petra (Dalman 1908:117, Fig. 34, *etc*.) and many examples on the tomb facades of Madâ'in Saliḥ (Jaussen & Savignac 1909, Figs. 138, 160, 162-165, *etc*.). Based on its contexts, mainly in tombs, the eagle is interpreted as representing a sky god, identified with Dushara and Ba'al Shamin, who protect the dead (Sourdel 1952:19-31, 66-68; Glueck 1966:471-479;

[14] All seven kiln of az-Zurraba, dated to the 1st-3rd centuries AD, were built of fired bricks, six of them are much smaller than that of Naḥal Sheḥoret. I'm thankful to David Graf for referring me to the kilns of az-Zurraba.

[15] RT-1923, 1790±50 BP (Segal & Carmi 1996:98) calibrated by OxCal 4.3, 1σ, 92-381 AD, the dominant peak in the calibration curve points at *ca*. 215 AD.

[16] In the past, the main copper mining and production in Timna was attributed to the New Kingdom of Egypt (Rothenberg 1988, 1990, 1999), but now the role of the Egyptians is minimized (Avner 2014b), especially in light of tens of new radiocarbon dates pointing to the 10th century as the heyday of copper production (Ben-Yosef 2016; Ben-Yosef *et al*. 2012, 2017).

[17] Grawehr 2006:345-8. I thank Erickson-Gini for the reference.

[18] BM 1116, 1945±300 BP (Burleigh & Hewson 1979:349), calibrated by OxCal 4.3(106), σ-1- 754 BC-640 AD, the dominant peak in the curve is *ca*. 50 AD. References to the debates on the furnace date see in Avner 2002:45-6; Ben-Yosef et al. 2008:2874.

Wenning 1996:257-8, 2009:583). next to the eagle is an inscription opening with "MNH[ΣΘH]" (= *be remembered*), but the name below is illegible. In the inscription below, one name is certainly Nabataean- ΓΑΡΗΜΟϬ, =Nabataean גרמו (*cf*. Negev 1991:20). Below this inscription is an engraving of an *aedicula* flanked by two palm trees and an altar or a standing stone in front (below), which is also paralleled in the Nabataean realm, with an altar or a standing stone flanked by two palm trees (Brünnow & Domaszewski 1909:322; Dalman 1908:147, 177, 254). The second Greek inscription from Timna bears a Nabataean name- ΜΑΛΧΙϢΝ, and underneath- ΕΙΤΥΧΙ ΔΕΣΠΟΤΑ- "(good) *luck* (to the) *master*" (Fig. 5). Next to it are some Nabataean letters, barely visible and fine engravings of animals and humans (outside Fig. 5).[19] Greek-Nabataean inscriptions became common during the 4th century AD, as a result of adoption of Christianity by the desert inhabitants (see Note 12 and below). Hence, the inscriptions from Timna attest to Nabataean activity in the copper industry, still during these centuries.

Naḥal ʻAmram

A large cluster of copper mines at Naḥal Amram, *ca*. 10 km north of Eilat, has been surveyed in the past by Rothenberg (1962:61-2) and Willies (1990). A renewed study since 2011 contributed rich information on Nabataean copper mining. Previously, the only clue to Nabataean presence in this area was a rock carving of a large "eye idol" (Fig. 6, Avner 2000:109), but the new survey doubled the number of known mines and reestablished the mines' chronology (Avner *et al*. 2018). Although the final shape and dimensions of the mines represent the Early Islamic period, ample Nabataean finds were uncovered in limited excavations in two mines and in a dwelling cave. These included a late Nabataean oil lamp and additional fragments, produced in Petra in the 3rd-4th centuries AD (Fig. 7), ropes, basketry, wicks and many fabric pieces, a variety of fruit remains,[20] animal and fish bones, and Roman coins of the 4th century AD. From the amount and variety of food remains one can learn that the miners were benefited with high quality nutrition, implying a high social status (Horwitz *et al*. 2018, *cf*. Sapir-ḥen & Ben-Yosef 2014, Sapir-ḥen *et al*. 2018). Another important find was four broken tips of still digging picks (Fig. 8). These tools left specific digging marks on the mines' walls (Fig. 9), different than those of the Early Islamic period. The Nabataean context of the tools (mainly from dwelling cave 35/24) helps distinguishing between the different working periods within the mines. Interestingly enough, all thirteen radiocarbon dates retrieved from the mines, from fruit, charcoal, fabrics, basketry, ropes, a wick, and an oil spill, were between the mid 1st and early 5th centuries AD (Avner *et al*. 2018, Table 1:7-18). Theoretically, most of these dates could have represented Roman-Byzantine management of the mines, however, no indication for these regimes was found in or around the mines. During most of this timespan, Nabataeans were the only candidates to operate and run these mines (see discussion below).

The intensity of copper mining at Naḥal Amram during these centuries further illuminates the copper industry at Aila, where considerable amounts of copper slag has been uncovered, as well as thousands of copper objects (see above). The excavators pointed at Faynan and Timna as the source of ore for this industry (Parker 1997:305, 2007:363; Dolinka 2003:95) but now it becomes clear that the large mines of Naḥal ʻAmram were the main source, rich in copper and the closest to Aila, only four hours walk.[21]

[19] It seems that the name and acclamation were not made by the same hand. The name Malkion (מלכיון) and a related name- Malkiw, (מלכיו) in Nabataean script are found in North ʻArabia (Negev 1991:39). However, the name ΜΑΛΧΙϢΝ is also found in Greek inscriptions in Greece and Asia Minor. I thank Leah Di-Segni for the comment on the name's occurrence in these regions. Since this inscription is found together with other Nabataean letters, the name Malkion should represent a Nabataean person.

[20] Fruit remains included dates, olive, almonds, nuts, peaches, pomegranates and vines, they are presently under a study by E. Weiss and M. David, Bar-Ilan University. Animal and fish bones, in addition to those published, are under study by L. Horwitz and O. Lernau.

[21] A similar situation has been studied from the Chalcolithic period. Intensive copper industry was found in two industrial villages excavated in ʻAqaba, Tell Magass and Tell Khujayrat al-Ghuzlan (Klimscha 2013). Initially, Hauptmann *et al*. (2009) pointed at Timna as the main source of ore for this industry but lead isotope analyses of copper ore from ʻAqaba, Faynan, Timna and Naḥal ʻAmram (Ketelaer & Hauptmann 2016), showed that the latter was the main source of ore for the ʻAqaba Chalcolithic industry.

THE DAFIT FORTRESS AND CARAVANSARY

The site is located 15 km north of Eilat (18 km from Aila) and 2 km north of the water source of ‘Ein Dafit (=‘Ein ‘Avrona). It was first recorded by Rothenberg (1967a:266) who identified the site as a Nabataean inn. Excavations in the site were conducted in 1984-5 by Cohen (1984),[22] but detailed analyses of the architecture, stratigraphy and artifacts were later made by Dolinka (2006). The fortress is 23.7x18.2 m, with 14 rooms surrounding a central courtyard (Fig. 10) and a gateway on the east, originally with three arches supporting a roof. It is termed by Dolinka caravansary, but the courtyard is too small (10.5x8.0 m) to accommodate caravan camels. Indeed, the site is almost identical in dimensions and plan to other Nabataean fortresses in the ‘Arabah: Taba on the eastern ‘Arabah, 22 km NNE of Dafit (Dolinka 2006), Be’er Menuḥa in the central western ‘Arabah (Cohen 1983) and Moyat ‘Awad in the north-western ‘Arabah (Cohen 1987). Therefore, Dafit can also be termed fortress.

Three phases were identified in the fortress by both Cohen and Dolinka. The first was built in the early 1st century AD, with mud-brick walls on top of the stone bases, and probably destroyed or damaged by an earthquake at the early 2nd century AD (Dolinka 2006:126,130,155).[23] The second phase, dated to the 2nd century AD, followed the same pattern of the first; the third phase was a tower, 5.2x3.8 m, built on the south-eastern corner (Fig. 10), while the rest of the fortress’ area turned to an open courtyard. Despite the division to phases, the site presents a full sequence of occupation during the first 250 years of the 1st millennium AD (*ibid*,156), as indicated by stratigraphy and artifacts. The identity of the site as Nabataean is clear in light of the typical pottery (*ibid*, Ch. 5), as well as coins of Aretas IV and Malichus II (*ibid*, 150).

An additional element in the site has not received enough attention- the remains of ramparts surrounding the fortress. Its northern rampart has been described by Dolinka (*ibid*,145) as a midden and protection from floods for the fortress. A probe cut through the north-eastern midden/rampart (L. 18) yielded animal bones, a Nabataean disc-shaped oil lamp and additional pottery sherds, five coins of Trajan and Hadrian and other finds (*ibid*,:145, 153). According to my own observation, there are three true trash dumps in the site, the main one is located *ca*. 20 m SSW of the of the fortress. The rampart remains, however, show that they originally surrounded the fortress, creating an enclosure, *ca*. 87x52 m (outer dimensions), and a courtyard of 42x47 m (inner dimensions) between the fortress and the southern rampart (Fig. 10). Hence, the site actually combined a fortress and a caravansary.[24]

[22] Practically, the excavation was carried out by Y. Israel, Y. Lender and D. Naḥlieli.

[23] This earthquake is unknown in any written source, but it is observed in several Nabataean sites in Jordan and the Negev (Korjenkov & Erickson-Gini 2003). However, according to Y. Israel (pers. com. 2.5.18), no collapsed stones were found in the dig, but they identified two floors in some loci.

[24] The reason for the specific location of the Dafit fortress and caravansary is unclear. It is only a three hour walk from Aila and no water source or a reservoir is discernible next to it (the nearest water sources are ‘Ein ‘Avrona, 2 km to the south, and Be’er Orah 3.5 km to the north-west). A caravan could have walked from Aila to Yotvata (see below) in a comfortable one-day walk without watering the camels. In addition, another site with a tower and a possible fortress is situated at Rujum, Maqraḥ, just 3.5 km to the north of Dafit. The site was surveyed in the past by Rothenberg (1967b:22-3) who related it to the Iron Age copper industry of the Timna Valley. Today the site is on the Jordanian side of the border. In a visit to the site in June 2005, with the assistance of Ḥaled Nasser and the escort of the Jordanian army, I saw flint and pottery sherds of the Chalcolithic-Early Bronze Periods, the Iron Age, Nabataean, Roman and Early Islamic, as well as small furnace copper slag. One reason for the Dafit location may be a band of trails visible from the air some 300 m north of Dafit, indicating a latitudinal road crossing the ‘Araba from the mouth of Wadi Muhtadi, in Jordan, to the spring of Be’er Orah on the western ‘Araba (Fig. 1). Another possible reason for the location of Nabataean fortresses along the ‘Arabah has been offered by Raikes (1976:13)- to allow eye and signaling contact from one post to another.

NABATAEANS IN THE YOTVATA OASIS

Yotvata (‘Ein Ghadhian) is an important oasis, 37 km north of the gulf of ‘Aqaba.[25] Palm groves, a spring and water holes, which sometimes overflowed in the past, were described by several explorers of the 19th and early 20th centuries,[26] indicating a high aquifer. Archaeological sites presently known in the oasis cover a sequence of the last 8000 years.[27] Nabataean sites include several buildings, the remains of a vast irrigation system, an unrecognized caravansary, a possible temple and a mausoleum. Besides farming, the oasis also served as a major crossroad and a road station (see below).

IRRIGATION SYSTEM

The remains of irrigation systems were first recorded by Musil, Frank and Glueck, (see Note 25) and later by Evenari *et al*. (1959:229-31, 1971:173-8), Rothenberg (1967a:291-3, 1967b:139-44) Porath (1985, 2016:37-47, 2016) and Meshel (1990:33-4), they include *qanat* systems, large wells or open pools, water channels and vast cultivated fields. “*Qanat*” (the ‘Arabic term for the Central Asian *karez* or the North African *foggara*) are underground water tunnels dug into the alluvium or conglomerate, several km long, with a minimal gradient of *ca*. 0.2%. On the surface, they appear as rows of circular mounds, usually *ca*. 10 m apart. A depression in the center of each mound denotes the location of a vertical shaft which originally reached the tunnel, presently filled with silt and stones. The total length of the Yotvata *qanat*, the longest in Israel, is 10-15 km (Avner 2016a, Porath 2016), but is still short when compared to those in Iran (see *e.g*. Lambton 1992, Yazdi & Khaneiki 2017).

Associated with the *qanat* lines are large depressions surrounded by silt and stone ramparts. Eleven were observed by Frank (1934, Plan 26) along a north-south strip 3 km long, mostly located at the foot of the western hills of the ‘Araba; only six depressions survived today. They are several meters deep, 10-30 m wide at their bottom, and 20-40 m wide on their rim (Fig. 11). These depressions were interpreted as “mother wells” which are the first and highest shafts of the systems, connecting to the tunnel where it penetrates the aquifer (Rothenberg 1967:293; Evenari *et al*. 1971:174; Porath 1987:110-11; Meshel 1990:3). “Mother wells” located within the *qanat* line were explained so that the tunnels were extended after the mother well has been dug (Porath 1987:110; Meshel 1990:33).

Indeed, the “mother wells” at Yotvata were part of a vast irrigation system, different and earlier than the *qanat*. Detailed discussions on these depressions were published previously (Avner 2002:408-9, 2016a: 23-5), here it would suffice to say that “mother wells” in other sites in the Near East are identical to all other narrow shafts in the systems (*e.g*. Yazdi & Khaneiki 2017:22). A look at Fig 12, also makes the situation clear. The largest depression at Yotvata (outer dimensions- *ca*. 60x60 m) is crossed by two (interrupted) lines of *qanat,* and two circular heaps surrounding covered shafts are seen in the northern side of the depression. A similar situation is found further south in System C3 (as numbered by Porath) where the *qanat* silt heaps overrun the rampart of an open pool. These cases clearly indicate that the depressions are earlier than the *qanat*, which are safely dated to the Early Islamic period (Porat 1986, 2016, Avner & Magness 1998, Avner 2016a). In short, the depressions were not “mother wells” but open pools or large shallow wells, which penetrated the high aquifer and reached a thick dark layer of clay that served as an

[25] The oasis’ present name follows the biblical one (Num. 33:33; Deut. 10:7) but with no solid identification. The Roman name, *Ad-Dianam,* is indicated in the Peutinger Map (Mouterde 1954; Nebenzahl 1986:20-25). For another Roman name, *Costia/ Kosiana/Osia* see Role and Avner 2008. The Arabic name- *‘Ein Ghadhian* was first mentioned in the story of ‘Abd al-Masiḥ, in the 9th century AD (Swanson 2008. #16).

[26] de Laborde 1830:53-54; Hull & Kitcener 1885:82-83; Musil 1908:253-256; Wooley & Lawrence 1915:32-3; Frank 1934:232-241, 250-263; Glueck 1934:41; Aharoni 1954.

[27] Among the sites in the oasis are: Late Neolithic-Chalcolithic habitations and copper industry (5th-4th millennia BC, Rothenberg *et al*. 2004), Early Bronze habitations and burials (4th and 3rd millennia BC, Meshel 1990, 1992), three fortresses: Iron Age I (12th to 10th centuries BC), Late Roman (late 3rd and 4th centuries AD, Meshel *ibidem*; Davis & Magness 2015), an Early Islamic fortress and other remains (7th to 11th centuries AD, Meshel *ibidem*).

aquiclude.[28] Freshwater snails found in all the open pools indicate that their water quality was good for irrigation.[29] Open channels attached to the pools conducted the water to the cultivated fields (Figs. 11, 13). Since the surrounding ramparts were higher, the water must have been elevated by some means and poured into the channels, possibly by a wooden arm (‘Arabic- *shaduf*).

A small number of Iron Age pottery sherds collected around some of the pools indicate their probable origin during this period (11th-9th centuries B.C.), however, most pottery sherds were Nabataean, a few were Late Roman and Byzantine. During the Late Roman Period, one open pool supplied the water to a bath-house built next to the fortress (Davies & Magness 2015:48-61).

Estimation of the amount of water supplied by the pools system at Yotvata, as well as the size of the irrigated area, is difficult. Evenari *et al*. (1971:176) measured it as 400 hectares, but assumed that only half was irrigated at a time. In any case, this scenario reflects the situation of the Early Islamic period, when the *qanat* system could have supplied more water to the fields than the open pools (Avner 2016a:32). Nevertheless, the existence of an agricultural system and population in the oasis during the Nabataean period cannot be overlooked.

NABATAEAN BUILDING

Several remains of Nabataean buildings are recognized in the oasis. One building appeared as a small mound, *ca*. 17 m across and 1.5 m high, 1 km SW of the old spring and the palm grove. South of the building the vegetation pattern hints at a possible outline of a courtyard; a water well is also built next to the building, filled with silt. A limited excavation in the building by Erickson-Gini (2012b) exposed some of the stone walls and collapsed stone beams of the ceiling and the second floor, but no floor of the lower story have been reached as yet (Fig. 14). Though the buildings perimeter is only partially expose its dimensions are *ca*. 12x12 m. Pottery from the building included decorated and plain fine Nabataean sherds, Nabataean ‘Aqaba Ware sherds, as well as Late Hellenistic ones (2nd-1st centuries BC) and Eastern Sigillata. One coin from the dig belongs to Ḥartat (Aretas) IV (9 BC to 40 AD), another coin was generally dated to the 1st century AD. The building probably served as a farm house, from the 2nd century BC to the early 2nd century AD. It may have collapsed in an earthquake, recognized in several contemporary Nabataean sites in the Negev and southern Jordan but unknown from written sources (see Note 22).

NABATAEAN CARAVANSARY

Just north of the Yotvata spring is a large building, first exposed in 1968 by heavy machinery work, during which its western part was erased. In 1985, Porath excavated ten probes in the site (unpublished) that revealed part of the building’s perimeter and several rooms (Fig. 15). All probes were rich with decorated Nabatean pottery sherds (Fig. 16) and some Hellenistic ones.[30] The walls are *ca*. 90 cm thick, built of roughly cut stones, on which patches of white plaster were preserved (Fig. 17). In one room, stone debris of 3.5 m high were uncovered, indicating a second floor that most probably collapsed in an earthquake. From the NE outer wall of the building a section of 19.5 m remained, from the SW wall only 8.7 m were left, but the SE wall is fully preserved, 43.5 m long (Fig. 15). This length is almost identical to the dimensions of two Nabataean caravansaries excavated by Cohen, Moyat ‘Awad[31], 41x44 m, and Sha‘ar Ramon, 42x42 m (Cohen 1983; Erickson-Gini & Israel 2013:39-41). As to the function of the building, Meshel (1990:24) briefly suggested it could be either a fortress or a cultic building, as indicated by the

[28] A probe excavated with a mechanical equipment by Y. Ḥaimi (2016), the Israel Antiquities Authority, in the largest open pool, exposed this dark clay layer in a depth of 4 m. This layer, also found in a probe by Sherzer (2010:191-226) next to the Yotvata spring, explains the function of the open pools. Arguments against separation of the open pools from the *qanat* were presented by Porath (2016:77*, Note 36). All of them deserve reply, but due to lack of space it cannot be done here.

[29] Four species of freshwater snails were identified by H. Mienis, the Hebrew University, at the Yotvata water systems: *Melanopsis buccinoidea*, *Melanoides tuberculata*, *Heleobia (Semisalsa) contempta*, *Pseudamnicola solitaria*, all are sensitive to salinity.

[30] I thank J. Porath for showing to me the pottery from the site during the dig.

[31] In many publications, Moyat ‘Awad is named Moa, mentioned in the Madaba map (following an erroneous identification of Abel, 1938:181-2) but could be better identified with Kalguia of Ptolemy (Meshel & Tsafrir 1975:14-20). Now the site’s Hebrew name is Orḥan Mor, *i.e*. the “Myra Inn”.

Puetinger Map (see below). Now, however, the building appears as another Nabataean caravansary, of the same type, but probably earlier than the others.[32] Therefore, the location of caravansary in the Yotvata Oasis further illuminates the importance of Aila and the Nabataean trade routes along the ‘Arabah (see below).

A POSSIBLE NABATAEAN TEMPLE

The *Tabula Peutigeriana* (Fig. 18, Mouterde 1954; Nebenzahl 1986:20-23) shows a red-roofed building in a place named Ad-Dianam, north of Haila (Aila). According to the map’s language, the building indicates a temple, while the name attests to a cult of the Roman goddess Diana. A candidate for the temple could be the remains of a building *ca*. 100 m NW of the Yotvata Spring and *ca*. 200 m SW of the caravansary. It is indicated by a squarish hillock, *ca*. 22x22 m and 2 m high (Fig. 19), similar in appearance to the hillock of the Nabataean building SW of the spring (see above), but larger. The site was never excavated. Presently, the caravansary and this hillock are the only known building remains in the spring’s immediate vicinity. The proximity of the latter to the spring, the palm grove and the surrounding acacia savanna makes the hillock a good candidate for the temple of Diana indicated in the *Tabula Peutingeriana*, the goddess of nature, wild animal and hunt, as well as of moon, love and fertility (Cartari 2012:77-99). However, the only pottery found around the building is Nabatean fine ware, so the temple could have originally been Nabataean, dedicated to Al-‘Uzza, “the mighty one” (Healey 2001:114-19). Her name points to a war and/or hunt goddess, while her identification also with the Greek Aphrodite (Levi della Vida 1938; Bowersock 1983:86-7; Healey 2001:114-19) adds the love and fertility aspect to her nature. If this conjecture proves correct, the squarish shape of the hill may fit to the shape of one of the two known types of the Nabataean temples, the square (*e.g*. Netzer 2003:86-106), which is termed רבעתא (=square) in Nabataean inscriptions (*CIS* II 160; Fima & Johns 1990; Naveh 1979). This type was usually built outside settlements, mostly next to ancient roads.[33]

Remarkable is the fact that the Roman editors of the map selected Yotvata/Ad-Dianam as the only site between the Nile’s delta and northern Syria to be represented by a temple. This certainly attests to the importance and fame of the temple and of the oasis in the Nabatean-Roman Period.

In addition to the above mentioned buildings, another, luxurious one, was probably present at the vicinity of the spring. This unknown building could have been the source of ashlar sandstone blocks chiseled in a typical Nabataean stile, found in a secondary use in the Late Roman fortress, 300 m to the north (Fig. 20).[34]

MAUSOLEUM

A large fortress was built in the 12th century BC on a cliffy hill just south of Kibbutz Yotvata and NNE of the spring. On the hill’s southern edge, a small, rectangular building was excavated by Mehsel, 3.2x3.6 m, and described briefly (1990:23). White plaster found around the building indicate it was visible from distances, similarly to a small Nabataean temple on Mount Serbal, southern Sinai (Avner 2015:402, Fig. 10). The tomb, robbed in antiquity, comprises two rectangular cells (Fig. 21). In the western cell, a complete skeleton was found laying on its back, partially covered by pieces of a high quality bleached linen (the largest- 45x33 cm), most probably the remains of a shroud. The eastern cell contained a complete cedar-wood coffin, with no lid, which contained only a few fragments of bones. The coffin

[32] Glueck (1935:41) mentioned a caravansary at ‘Ein Ghadhian, at the foot of the western hills. Obviously, he actually addressed the site which is known to date as the Late Roman-Byzantine fortress (Davis & Magness 2015). He did not observe the caravansary discussed here.

[33] According to Nehmé (2003) RB‘T’ should be understood as a bench, devoted to gods, while another term, ‘RB‘N is the quadrangular building. I thank Nehmé for sending to me here article.

[34] The nearest known quarry for ashlar sandstone block is in Wadi Tweibeh, in Sinai, 10 km SW of Eilat, *ca*. 47 km south of Yotvata (Fig. 44). The ashlar blocks cannot be related to the temple of Diana/Al-Uzza since according to the Peutinger map, the temple existed in the 4th century AD, simultaneously with the fortress.

showed a high quality of workmanship.[35] Based on pottery sherds found in and around the tomb, Meshel dated it to the Early Roman Period, but a re-examination of the pottery by Erickson-Gini identified them as Hellenistic, 2nd century BC, which actually means a Nabataean affiliation. Two additional pottery sherds found by the author were Hellenistic, dated to the 2nd BC, another was a fragment of eastern Sigillata, 1st century AD. Artifacts in the tomb were very few, due to the robbery, two copper nodules and a fragment of copper ring. In addition, two copper chain-joints and a scoria bead were found outside the tomb.

The cedar wood for the coffin, or the complete coffin, was most probably brought to Yotvata from the Lebanon Mountains, some 600 km to the north. The tomb must have been owned by a family wealthy enough to afford transporting the costly coffin and the construction of mausoleum on the edge of the cliff.

NABATAEAN SETTLEMENT IN ‘UVDA VALLEY.

‘Uvda Valley *ca*. 5x12 km in area, is situated some 40 km north of the head of the Gulf of ‘Aqaba, *ca*. 10 km west and above the Yotvata Oasis. On its eastern side a dense settlement system has been discovered. To date, an unfinished survey recorded 756 ancient sites on an area of only 60 sq km. Most are dated to the 6th-3rd millennia BC, but there are earlier and later sites as well. The density of sites in this area is the highest known in the entire Negev, despite the hyper arid environment. What motivated the ancients to settle here was an unusual combination of local conditions: the valley’s topography, unique soil and unique flood regime, which enabled large scale agriculture (Avner 1998, 2002, Ch. 2, 2014).

TENT CAMPS

The dominant phenomenon of Nabataean settlement in ‘Uvda Valley is the numerous tent camps. Such camps are known all over the southern Negev, but in ‘Uvda Valley their density is especially high; currently, 152 tent camps are recorded, mainly on its eastern side (Fig. 22). Tent camps comprise 10 to 30 tent bases, usually in a row along a low wadi terrace, mostly 50-150 m long (Fig. 23). Tent bases are circular, *ca*. 4 m in diameter, with a scatter of medium size stones around them, used in the past for tying the tent ropes. Flint items and pottery sherds found on the camps surface, indicate occupation in various periods, from Late Neolithic to Early Islamic, but most dominant are the Nabataean sherds, mainly undecorated (Fig. 24). These tent camps should not be seen as the remains of short-term encampments, but as dwelling camps. Tent camps are commonly related to herders, but at least in the case of ‘Uvda, farming was no less significant (see below). Most of the camps are identified as winter camps, judging by their location, sheltered from the prevailing northern wind, by the amounts of pottery sherds and by the numbers of standing stones (see below). Summer camps, on the other hand, are open to the wind, are usually smaller and contain less pottery sherds and standing stones. Therefore, it is suggested that winter camps were occupied for longer periods during the year (autumn, winter and spring), while summer camps were relocated two or three times, with the movement of the herds from one grazing area to another. Their smaller size may indicate that only part of the family or clan accompanied the herds during the summer, while others were stationary (*cf*. Al-‘Aref 1937:117-19; Marx 1967:83-6). The large number of tent camps imply a large population. If an average tent camp contains 20 tents, if each tent represents a nuclear family of five people in average, and if only a fifth of the camps were occupied simultaneously, the estimated population of the valley could be around 3000 people (without taking in consideration tens of tent camps which are yet unrecorded).

The connection of tent camps to farming can be deduced from several data. One is their prominent location, on the eastern margin of the valley and in the adjacent wadis (Fig. 22). The eastern side was also densely settled by the pre and proto-historic sites, in which ample farming stone tools were found (Avner,

[35] Following the dig, the skeleton (Fig. 21) has been covered *in situ*, unstudied. In December 2018 the mausoleum was re-excavated by U. Avner, I. Hershkowitz, S. Borgel and A. Pokhojaev. The skeleton was found well preserved, belonging to a male *ca*. 50 years old, which is now under study. First result of ^{14}C dating is *ca*. 200 BC (to be published with the anthropological report of the skeleton). The fabrics from Meshel’s excavation were studied by N. Sukenik and O. Shamir, the coffin was studied by Y. Sitri; their studies are included in an in-press book on Meshel’s excavations of the Iron Age fortress, edited by L. Avitz-Singer, Tel Aviv University.

ibidem). This side of the valley is lower, so the majority of floodwater runs along it. The soil here is of a high quality for agriculture (a combination of lime-sand and silt) and in addition, the ancients built a long series of 'limans' (irrigation basins), covering an area of 600 hectares in one unite (Fig. 25).[36] Additional plots were cultivated in the wadis to the east and along Naḥal Ḥayun that drains the valley northward, amounting to a total of 1200 hectares. Nabataean pottery sherds collected from the fields' surface, together with earlier finds, indicate the periods of cultivation.

Nabataean pottery sherds were also found in 28 out of 32 threshing floors recorded on the eastern side of the valley (Fig. 26). They were all first built in the 5th-4th millennia BC but were also used by the Nabataeans. Here, a philological point is of interest. The Bedouin-'Arabic name for the valley is *Wadi 'Uqfi*, a term for a wooden pole harnessed to the animals and dragging the threshing sledge (Avitsur 1966:76). The word originated from the western semitic root- עקף "walk about". The Bedouins of the Negev and Sinai, however, threshed their yields only by trampling with animals, and when questioned, were unfamiliar with the sledge or with the source of the valley's name. Since the source of the name could not have been Bedouin, it may be attributed to the Nabataeans. Their language was Aramaic (*e.g*. Naveh 1982:9-11, 135-159) and the root עקף also appears in Aramaic documents (*e.g*. Jean & Hoftijzer 1965:220). The geographical name of 'Uvda Valley as an agricultural one is unique in the entire Negev.

The large-scale farming in 'Uvda Valley has direct implications to the economy of Aila, as the nearest and largest source of cereal to the town. This is well reflected in the following observation of Musil, who visited the valley in 1898 and 1902: "*In Wadi 'Uqfi, the soil is good for cultivation and the crop is plentiful when the rain is sufficient to create floods. In this valley the citizens* (of 'Aqaba) *are renting plots from the Ḥaiwat, sowing wheat and barley and living in tents by the fields in the seasons of sowing and harvesting. After the harvest they return to 'Aqaba with the threshed grain"* (Musil 1926:85)[37]. In this light, barley and wheat found in the excavation of Aila (Parker 1997:39; Ramsey & Parker 2016) could be cultivated in 'Uvda Valley as the main source of grains. Aila could be reached by camel caravans from 'Uvda in one long day, or comfortably in a day and a half (see map, Fig. 36).[38] Many caprine bones found in the excavation of Aila reached the town "on the hoof" (Parker, *ibid*), were most probably from the entire hinterland of the city, including 'Uvda.

In the tent camps and next to some of the threshing floors, many small standing stones were found. They occur in repeating numbers and in repeating arrangements of types of groups within each number (Figs. 27).[39] Based on Nabataean cult niches and inscriptions from Petra, Wadi Ram and Madâ'in Saliḥ, and based on written sources, the standing stones can be safely identified as aniconic, abstract representations of Nabataean deities. Since many different types of groups of stones recur in the desert, it seems that each group represented a specific 'organic' groups of deities (Avner 2000, with references). Therefore, from the large variety of the standing stone's groups we may deduce that the Nabataean pantheon and mythology were actually much more complex than those we can learn about from inscriptions, from the remains of temples or other sources.

NABATAEAN BUILDINGS

Three circular structures or courtyards were found during the survey of 'Uvda Valley, 10-15 m in diameter, preserved up to 1.5 m high (Fig. 28). All were built on top or next to protohistoric sites, using their stones, and following the same masonry method- a double wall with a fill-in of small stones, gravel and silt, one was left unfinished. Fine Nabatean pottery sherds, mostly undecorated, found around all three structures date them to the 1st-3rd centuries AD; fragments of hand millstones were also found in two buildings. One circular structure was excavated (Cohen 1980a), but with no further finds. Currently, we do not know

[36] Finds collected from the surface of the cultivated fields included flint and pottery sherds of the 5th-3rd millennia BC and pottery sherds of the Iron Age, Nabataean and the Early Islamic period. The embankments were most probably first built in the 5th millennium BC (Avner 2002:24-5), but they were certainly in use during the Nabataean period.

[37] For further details on the Bedouin cultivation in 'Uvda see Avner 2007.

[38] A detailed discussion by Ramsey & Parker (2016:116) mention several possible sources of cereal for Aila in a broad area of the Negev and southern Jordan, but the nearest and largest one, 'Uvda Valley, was overlooked. Another source missed by the writers is Qa' as-Sa'idin, 70 km north of Aila, in the 'Arabah (Al-'Aref 1937:133 ; Braslavi 1952:72, 184, 200; Avner 1980).

[39] Definition of the groups is based on the proportion of each stone, whether narrow of broad, its relative size and position within the group. For example, six different pairs and seven types of triads are distinguished (Avner 2000).

similar buildings in other Nabataean sites; their function is also unclear. At a first look they seem like animal corrals, however, tens of them in 'Uvda were built differently, with lower quality of masonry.

In a small wadi opens to the eastern side of the valley, a different, larger building was first mentioned by Musil (1908:181) as a Roman fortress, named by the Beduins "ksejr ad-Dil". Rothenberg (1967a:306) described it as an Iron Age fortress, however, the building could not have served as a fortress at all, due to both its location, at the foot of a low cliffy hill (Fig. 29), and its ground plan. During my own survey (Avner 1982:82), Iron Age pottery sherds were not found, only Nabataean ones. The amount of debris in and around the building indicate it was originally of two stories, but only the lower story partially survived. Excavation by R. Cohen (1980b) two halls, the inner dimensions of the larger is 10.5 x 6.5 m, with a row of four square pillars, 50x50 cm each, that supported the ceiling and the second floor. The smaller hall is 9x5 m, containing two bench-like ledges, 9.0 and 4.8 m long, filled with sand. These may have served for supporting jars, such as the 'Aqaba amphorae, used for storing organic matters. Next to this building was another, smaller one, built in a rock shelter; several stone installations were next to both. The finds in the buildings included decorated and undecorated pottery sherds, a complete oil lamp, a decorated votive cooking pot and an *unguentarium* (Fig. 30a). Outside the main building a pottery sherd was found with a relief of the face of Tyche in an oriental style, with her crown of a city wall and a gate (Fig. 30b, Avner 1990). Small remains above her crown hint at some scene that probably surrounded her.

As mentioned, the building could not have served as a fortress, and its ground-plan does not resemble farmhouses or any of the two known types of Nabataean temples (although the votive cooking pot and the Tyche sherd may indicate some religious activity), but it can be identified as a public building. The larger hall could serve for congregations; the smaller one could be a storage room, *e.g.* for grains as taxes or supply for caravans. In any case, the very existence of a public building in the middle of such a large cluster of tent camps indicates an organized community of farmers and herders. The position of the building at the foot of the hill, not on top, reflects self-confidence of the community, feeling safe in their territory.

CULT INSTALLATIONS AT BE'ER ORAH

Be'er Orah, 17 km north of Eilat, is a water source, surrounded by ancient sites of various periods. One is a large copper smelting site (Fig. 31), mainly dated to the Early Islamic Period by pottery and radiocarbon dates (Avner & Magness 1998, Table 1), but small amounts of Nabataean pottery indicates its earlier origin. The estimated amount of copper slag is 3000 tons, based on a Lidar 3D imaging (Arav *et al*. 2018). Copper ore was brought to the site mainly from Naḥal Amram, eight kilometers to the south, which also supplied the ore to three additional, smaller smelting camps in the region.

As in many mines and copper production sites, several installations and structures are identified as cultic, three are described here. One is a small shrine with a trio of slag slabs set vertically into the ground (the right one is broken), with a pavement in the front (Fig. 32). The shrine is similar to tens of trios of small Nabataean standing stones found in the desert, of various types. In this group, the central slab is broad (*cf*. Fig. 27c), interpreted as representing a goddess, while the flanking smaller ones represent young deities, her offsprings (Avner 2000:104-5). No indication was found for the date of this small shrine, it could be Nabataean, Early Islamic or both, however, a Nabataean tradition is clearly observed here. In hundreds of such groups of standing stones in the desert, no sacred orientation is observed, they face all directions, but almost all of them share a principle, in which the back of the stones turns towards a nearby hill or to a remote mountain. The prayer, who kneels before the slabs, sees them and the hill behind in the same line (Avner 2000:108-9). This is also the case here at Be'er Orah (Fig. 32).

Second is a low, rectangular structure, 4x3.5 m, made of slag slabs laid horizontally, found covered (concealed) by additional slag slabs. Standing slag slabs were observed in the structure before excavation: a pair on the eastern side, facing west, the left one is 34x33 cm, the right one is partially broken. Another, single slab, is set on the southern side of the structure, 42x25 cm (Fig. 33). Along the eastern "wall" and at the foot of the pair of standing slabs, an offering bench of horizontal slag slabs was uncovered, on which two seashells were laid as an offering. Charcoal from the bottom and top of the dig were dated by ^{14}C *ca*. 900 and 1280 AD (Avner & Magness 1989, Table 1:10, 22), *i.e*. Early Islamic and Mamluk dates.

Nevertheless, here too the Nabataean orientation tradition is observed- the back side of the pair of standing slabs face the hill behind. The southern slab is set so that the prayer faces the slab and the south, the direction of Mecca.

Third is a rectangular structure, 6.4x5.7 m, delineated by slag slabs set vertically into the ground, with two semicircular niches, on the eastern and southern sides (Fig. 34a). Probes in the structure were first excavated by Rothenberg (1972:221-2), who identified it as a 'symbolic church', with an apse on the east. He also mentioned the southern niche but did not explain it. Later I suggested that the southern niche was a *mihrab,* added to the open church (Avner 1984:124-5).[40] Following a complete dig of the structure in 1992, Sharon suggested another explanation to the two niches: The structure was only a mosque, in which the original prayer direction of early Islam had been preserved- to the east (*qibleh mushariqa*). This prayer direction did not survive in other ancient mosques since in 693 AD 'Abd al-Malek ordered the change of orientation of all mosques in the entire Umayyad empire, toward Mecca, following his conquest of this city (Sharon *et al*. 1996).

In my opinion, the structure could not preserve the eastern prayer direction of early Islam. The dig showed that the slag slabs forming the structure's outline were set in a foundation trench, dug into an alluvial level of fine silt, 25 cm thick, without penetrating the virgin soil. This level, which contained smelting refuse and charcoal, was dated by six radiocarbon dates, from *ca*. 660 AD at the bottom to *ca*. 1060 AD at the top (Sharon *et al*. 1996:112; Avner & Magness 1998, Table 1:5-9,21). This means that the foundation trench was dug into the alluvial layer in a late phase, long after the disappearance of the eastern *mihrab* from the early mosques. Unavoidably we return to the interpretation of the structure as an open church and an open mosque, simultaneously serving both religions. This kind of relation seems impossible today, but tolerance between the two religions is well reflected in many 'Arab ancient sources describing 'Arab dignities praying in churches, until the Crusader time (Bashear 1991).

Here again, we find the Nabataean tradition perpetuating in the Christian era. The location of the open church was selected so that the apse points to the east and to the top of the hill behind (Fig. 34b). Hence, it is suggested that the structure was built as an open church for Christian Nabataeans, and a mosque for those who adopted Islam. Another small open mosque, excavated by Y. Israel (2009) at Be'er Orah, shows the same principle. It is built just north of a hillock, so the prayer facing the *mihrab* on the south, also sees the hillock in the same direction- of Mecca (Fig. 35).

ANCIENT ROADS AND NABATAEAN TRADE

The transfer of Nabataean commerce through Petra is well known (*e.g*. Strabo, 16.4.23); trade that passed through Aila is also described as continuing via Petra (Parker 2007:363, 2013:688; Dolinka 2003:94). However, the trade routes scenario was actually more complex.

First, another road connecting Aila with Ghazza is attested by classical writers. Strabo (16.2.30) mentioned a distance of 1260 stadia (*ca*. 233 km) between the two cities, and Pliny (5.12.65) mentioned 150 miles (*ca*. 222 km). These distances certainly refer to Darb Ghazza, the shortest and most convenient route between the two cities. The writers' interest in the length of the road may well be connected to their interest in trade, which they often addressed. Their interest in the length of the Red Sea (Strabo 16.4.4; Pliny 6.26.107, 6.33.163), bears the same motivation and connects Aila with marine trade.

Indeed, caravans from Aila to Ghazza, had no reason at all to go through Petra (contrary to Parker and Dolinka, above). This route was not only horizontal detour, but also vertical. It meant going from sea level at Aila up to 1650 m a.s.l at Ras al-Naqb, then down to Petra at about 1000 a.s.l, and then difficult winding trails down to the the 'Arabah, again to sea level, to reach Moyat 'Awad, on the way to Ghazza. This section of the road would have taken five strenuous days, compared to three easy days along the 'Arabah from Aila to Moyat 'Awad.

Identifying a road along the 'Araba presents some difficulties. In the past, several scholars addressed a road, or even roads along the 'Arabah, on both sides (east and west), mainly in relation to the Roman period (Musil 1908:180-224; Woolley & Lawrence 1915:32; Frank 1934:225-34; Alt 1935; Gichon 1971, 1980, 1997, 2002). Others, however strongly argued that no important road ever ran along the 'Arabah.

[40] I do not know of other examples of open churches, but open mosques are very common in the desert, see *e.g*. Avni 1994.

Karmon (1968) described the difficulties of maritime navigation in the Red Sea as limiting the commercial value of Aila, and a "dead end" to which the 'Arabah Valley leads- the Dead Sea, so that no economical feasibility is expected from a trade route along it. Rothenberg (1971:220) emphatically wrote against the existence of an ancient road along the valley: "*… it was a no mans land*"*... The 'Arabah's great heat and aridity, its difficult topography, sand-dunes, swamps and blinding sandstorms.... There was never a line of 4th century castellae in the 'Arabah, and no traces of any north-south road running all the way from the Dead Sea to the Red Sea have ever been found…"*. Rothenberg's views have been adopted by other scholars (*e.g*. Bowersock, 1983:179; Parker, 1986: 6, 142). Meshel (1979;298, 302), supported the position of Karmon and Rothenberg. He also described the difficult conditions in the 'Arabah and added the itinerary of Robinson, in 1838, who preferred going from 'Aqaba to Ḥebron on Darb Ghazza rather than along the 'Arabah. However, he did mention that a secondary road could have gone through the 'Arabah during the biblical period.

In my opinion, all arguments against the existence of an ancient road along the 'Arabah can be refuted; following are the main points:

1. Living conditions in the 'Arabah are not as difficult as described by Rothenberg (personal experience during the last 50 years). In fact, agricultural works, tourism and archaeological projects are taking place in the 'Arabah throughout the year. Dust storms are rare, limited to several hours, in the spring and autumn. The sand dunes are low, easily bypassed from east or west, and were also easily crossed during the Roman period (Avner & Roll 1996, Roll & Avner 2008). The Sahara desert, on the other hand, with much higher dunes and on distances of many hundreds of kilometers, is still crossed today by camel caravans, (Abercrombie 1991). Swamps are formed once in several years in the playas of the southern 'Arabah, but they are also easily bypassed (*e.g*. Hull & Kitchener 1885:210). Generally, the flat topography of the 'Arabah is very convenient for caravans, and can be crossed in four comfortable days, from the Red Sea to Dead Sea, with water sources on both sides of the valley. In addition, there are many roads going from the 'Arabah up to the Negev Highlands and to Ghazza, or through Ḥebron and the Judaean Desert to Jerusalem (Roll 2007; Avner 2016 and here Figs. 1, 36). The 'Arabah was never a "*no-mans land*". Although it was never systematically surveyed, many archaeological sites are known here, of most periods from Paleolithic to near present (*e.g*. Bienkowsky 2006).

2. Robinson's avoidance of riding along the 'Arabah, was not due to the environmental difficulties but due to the threat from the Bedouin sheikh of the 'Alawin, who was hostile to European explorers. This is well explained in the full version of itinerary (Robinson & Smith 1841:244), but not in the shorter version (Robinson & Smith 1856:173) referred to by Meshel. On the other hand, Burckhardt (1822:443), before Robinson, mentioned an eight day walk from Ḥebron to 'Aqaba through the 'Arabah- "*...for this is both the nearest and the most commodious route…*"- a road which he also related to King Solomon. A road from Ḥebron to Aila was also mentioned by Eusebius, in the 4th century AD, while relating to "Ḥazazon Tamar" (# 8, Notley & Safrai 2005:8-9), today- Ḥazevah in the northern 'Arabah (Cohen & Israel 1995). A "*highway*" along the 'Arabah was mentioned by Kitchener (1884: 211) which he passed with camels. Another important description has been given by Petheric (1861:33–37), of a caravan of 300 camels and 80 men that he saw in the 'Arabah, south of Timna, carrying wheat grain from Egypt to Syria. The eight days walk from 'Aqaba to Ḥebron or vice versa, means nine days between Jerusalem and 'Aqaba. Riding from 'Aqaba to Ḥebron on the comfortable Darb Ghazza took Robinson (*ibid*) ten days, still two days more than through the 'Arabah. However, walking from 'Aqaba to Jerusalem on the "Kings Highway", on the Edomite Plateau, takes at least 13 days. Obviously, the shortest and most convenient route between the two sites runs along the 'Arabah, just as noted by Burckhardt (above).

3. Most compelling for the trade routes along the 'Arabah are the clear remains of several ancient roads on the western 'Araba, as well as on the east.[41] On a plain, an ancient road is seen as a band of parallel trails, usually 100-200 m broad; *e.g*. Darb Ghazza (Fig. 37) and Darb al-Hajj, crossing Sinai west-east (Avner 2002 Ch. 8, 2016 Figs 3, 4). Seemingly, a broad band represents a major road, while a narrow one is secondary. However, this distinction is only partially correct. On the "Incense Road", the "highway" of Nabataean trade, in the section from the 'Arabah to Ghazza, the band of trails is only 10-20 m wide (Fig.

[41] Alt 1935, Raikes 1979, Nos. 8, 12, 24, 26, 29, 93; Smith 2005, 2010: 61, 68, 78. Sites *SAAS 169, 231, BMP/CAS 6*; Dolinka 2006a.

39), although it served large camel caravans.[42] Where a band of trails approaches a topographic obstacle, they merge into a narrow winding trail (‘Arabic- *naqb,* Fig. 40), on which an investment of labor is sometimes observed, of building retaining walls and cutting rocks. Artifacts collected from the trails represent almost a complete sequence of use during the last 10,000 years (Fig. 41). In addition, prehistoric cult sites, which often attend the roads, indicate that the complete network of trails system was already well established by the 7th millennium BC (Avner 1984, 2002, Ch. 6, 2018). The roads maps of the Eilat region (Fig. 1) shows a dominant direction- from SE to NW. They actually connect the head of the Gulf of ‘Aqaba and the southern ‘Arabah Valley, with Darb Ghazza, hence, they form part of the international trade routes from south ‘Arabia to the Mediterranean ports. This is also the dominant direction of the roads in the rest of the Negev (Fig. 36). Nabataean use of the roads is clearly indicated by pottery sherds collected from the trails and by typical small Nabataean standing stones (see above) that attend them.

Sections of similar bands of trails were found all along the western side of the ‘Arabah (Avner 2016). Not less significant is the position of the two caravansaries in the southern ‘Araba, Dafit and Yotvata. These are only the first after Aila, in a long chain of Nabataean caravansaries and posts that guarded a road running northward along the western ‘Araba: Be’er Menuḥa (Cohen 1983), Moyat ‘Awad (Cohen 1987) ‘Ein Raḥel (Israel & Naḥlieli 1982; Korjenkov & Erickson-Gini 2003), Ḥatzeva (Cohen 1994; Cohen & Israel 1994:28-33; Erickson-Gini 2010:97-100) and Mezad Mazal (Svetlana 2013, see map Fig. 36).[43] Caravans that reached Yotvata from Aila, in one comfortable day of walk, could continue up to ‘Uvda Valley on Ma‘aleh Shaḥarut (Naqb adh-Dhil) or on one of the other five ascents to join Darb Ghazza (Figs. 1). They could also continue northward along the western ‘Arabah through Be’er Menuḥa, to join the “Incense Road” at Moyat ‘Awad, on the way to ‘Abdat and Ghazza; they could also choose several other alternatives to continue north-west, either before or after Moyat ‘Awad (Figs. 36). These posts not only guarded the longitudinal road, but also latitudinal ones.[44]

The map in Fig. 36 shows the most principle trade and military roads in the Negev in the Nabataean-Roman time, but in reality, the road network was much denser. Many additional roads were only hiked or observed from the air, but were not documented in detail.[45] The situation is somewhat different in the Eilat region, where more ancient trails were surveyed (not all) and the result is a map of a dense network, despite the mountainous nature of area (Figs. 1).

In addition, tent camps of a specific type are found next to some of these roads, very different from the dwelling tent camps (see their distribution in the southern Negev in Figs. 1). They are all located on wadi terraces next to roads and they all follow the same pattern- a row of built tent bases, square or rectangular, with curve corners; their walls are built of two rows of stones, with a fill-in of gravel and silt (Fig. 42), similar to the Nabataean circular structures in ‘Uvda (see above). Remains of dwelling tents, on the other hand, are just cleared circles, *ca*. 4 m across, with no architecture (Fig. 23). Pottery sherds collected from the surface of the built tent camps are dated from the 1st century BC to the 3rd century AD.[46] The sites uniqueness, uniformity and location next to the roads, lead to their interpretation as military camps

[42] A clue to the size of the Nabataean caravans may be found in the words of Strabo (16.4.23): “*…merchants with camels are traveling from this place* (Leuke Kome) *to Petra and back easily and safely, in such numbers which do not differ at all from an army…*” Descriptions of large caravans, of thousands of camels were given by European merchants who joined ‘Arab caravans in the Middle Ages and later (Grant 1937). It can be assumed the tradition of the organization of large caravans did not change much from the Nabataean time to the Middle Ages.

[43] Logically, there must have been a Nabataean fortress at Yotvata, but no remains have been identified so far. In addition to the above list of posts, the remains of another Nabatean building were found next to the longitudinal road on the western side of the ‘Araba SE of Be’er Menuḥah (Avner 1997:134).

[44] For latitudinal roads crossing the ‘Araba see *e.g*. Frank 1934:263-4; Kirk 1938; Ben-David, 2013. Musil, in his exploration of the ‘Arabah in 1902, mentioned by names 15 ascents from the valley to the west and 11 ascents to the east (Musil 1908:180-224). On one of them, Naqb ad-Dhaḥel, Lawrence of ‘Arabia went down with a troop of Bedouin warriors from Buseira to ‘Ein Ḥusb (Ḥazeva) in one night (Lawrence 1935:501).

[45] The map is based on the location of relevant sites and on following trails on foot, some were turned to vehicle dirt-roads during the last 70 years. Some roads were completed following the Negev map of Captain S.F. Newcombe, 1914, published by the Palestine exploration Fund in 1921.

[46] No tent camp of this type was excavated as yet, so their timespan still require confirmation.

guarding the roads. One support for this interpretation comes from a Nabataean stronghold built on top of Naqb Judeid, southern Sinai, which includes a fortress, an additional building, a typical rock-cut Nabataean water cistern and a tent camp of the same type as described here.[47] If these tent camps accommodated military units, the only possible justification for the investment of a defense budget and manpower is to guard these 'small' roads for caravan trade, not for shepherds who move with their herds. So, these tent camps supply further support to the use of 'small' roads for trade, in addition to the main 'highway', which also looks like a 'small' road (Fig. 39).

Now the question is why were these many roads necessary? One answer is that any trade road needed parallel alternative branches. Typically, rains in the desert are confined in time and space. One limited area may receive a good amount of rain in a certain year, while no rain falls on the neighboring areas a few kilometers away. The caravan would obviously choose a branch of a road which crosses an area with better pasture and available water. Second, security problems and disagreements with local tribes on the cost of passage rights through their territory may force the caravan to bypass such hazards.[48] The caravan scout (*daleel*) had to be well acquainted with the various options in each section of the long road (Grant 1937:129-30) and had to constantly collect information about the conditions on the coming sections of the road.

The above data on the ancient roads, and the identification of caravansaries at Dafit and Yotvata, actually emphasize the importance of the roads along the 'Araba, of Darb Ghazza and many other desert trails. They also emphasize the position of Aila as a port town and emporium.

INSCRIPTIONS ALONG THE ANCIENT ROADS

Connected to the ancient road system is the occurrence of old inscriptions. Thousands of Nabataean inscriptions are known in Sinai, hundreds along the Darb al-Bakara in northern Hejaz (Nehmé 2018), some are also found in the Eilat region (but over the Egyptian border), two clusters of inscriptions are situated on a branch of a road connecting the Gulf of 'Aqaba with Darb Ghazza. One is in Wadi Tweibeh, close to the sea shore, 12 km SW of Eilat (Fig. 1), where there are some copper mines (Frank 1934:247, Taf. 45) and a quarry of hard sandstone, with oblique chiseling (Fig. 43, *cf*. Rothenberg 1970, Pl. 11), similar to that of the Nabataean quarries of Petra. The site is famous for a Greek inscription of the Roman *LEG[IO] III CYR[ENAICA]* (Alt 1935:62-64; Kolleman 1972), but Nabataean, Thamudic and Early Islamic inscriptions are there as well (Rothenberg 1970:19; Avner 1972). One Nabataean inscription (Fig. 44) reads: **שלם ודכיר עליו בר שעדאל** (*peace and be remembered 'Alyu bar Sa'adal*). Second site is Wadi Umm Sidra, 12 km west of Eilat, from which a number of Nabataean inscriptions were published by B. Sapir (in Rothenberg 1958:179-182), with errors. The reading of one inscriptions, actually divided into two, has been corrected by J. Naveh (1970). The upper reads **עממו בר שעדאלהי**, (*'Ammu son of Sa'adalahi*),[49] the lower- **דכיר שעדאלהי בר בריאו** (*be remembered Sa'adalahi son of Bariu,* Fig. 45). Based on the differences in forms of the letters **'ד'** and **'ע'** in both inscriptions, the upper one is later. All names are common in the Nabataean inscriptions of Sinai and the Negev.[50] Another inscription is Greek-Nabataean, naming AKPABOE (=scorpion), above a Jewish candelabra (Fig. 46).[51]

[47] The site was discovered by E. Bergman, excavations were conducted by A. & O. Goren but remained unpublished. A brief description of the site and a photo see in Avner 2015:407.

[48] Passage fee, in addition to other payments, were mentioned by Pliny (12.32.63-65). For later examples of Bedouins charging passage fee from caravans see Grant 1937:155-6; Peters 1994:157-162.

[49] In the upper inscription, Naveh could not read the first three letters, but they are legible in my own photo (Fig. 45).

[50] The name- **שעדאלהי בר בריאו** appears 11 times in Sinai (*CIS* II 3:248 with reference to inscription numbers), **עממו** is very common (*CIS* II 3:245) but not with **שעדאלהי** as a father name.

[51] The name **עקרבו** (scorpion) in Nabataean script appears four times in Sinai (*CIS* II:246). The inscription to the left of the candelabra reads: VICTORIA AU(GUSTIS) CC. The double C indicates plural - CAESARES, implying the first or second Tetrarchy period, 293-324 AD. This inscription was added next to the Jewish candelabra, but the inscriber avoided harming it.

DISCUSSION AND SUMMARY

Nabataean remains in the Eilat region are not as spectacular as in the Petra area or Madâ'in Saliḥ, and not well studied, but they do reflect an intensive presence and a variety of activities: Farming and herding, copper industry, stone quarrying, pottery production, trade, military and religion. While in the Negev Highlands a Nabatean presence was almost limited to road stations, which developed into towns only during the Late Roman and Byzantine periods (Erickson-Gini 2005; 2010; 2012), in the Eilat region we probably see their presence from the 3rd or 2nd century BC to the 7th century AD. Mentioning of Aila as a *polis* by Strabo (16.2.30) in the late 1st century BC or early 1st century AD, means the that Nabataean settlement in the site began earlier. More so, Hellenistic pottery at Tell al Kheleifeh, Yotvata (three sites) and Be'er Menuḥa implies that marine and land transfer of goods already took place through the Gulf of 'Aqaba and the 'Arabah in this period, which actually continued and developed from the Iron Age and the Persian period. It also implies that some power was present early in the region, strong enough to run the construction of posts and control the trade. This accords with the account of Hieronymus (through Diodorus 2.48.1-49.1, 19.94.4-8), by the late 4th century BC, that the Nabataeans were already rich enough to attract Antigonus to raid them. Their source of wealth was certainly the trade, as described by Diodorus. Possibly, already at that time the Nabataeans had some port facilities and a settlement at Aila, which were not discovered yet due to the limited excavated areas (B, M and O) and their distance from the seashore, 500 m away.

During the following centuries, the Nabataeans were the dominant element in the region, while the role of the Roman empire seems secondary and discontinuous. This can be exemplified by the coins found in the excavations at Aila. Out of 264 Nabataean coins, 46 were safely dated, from Aretas III to Rabael II (ca. 85 BC to 106 AD, Parker 2013:686), but only three Roman coins were found, two of the 1st century AD and one of Trajan (Betlyon 2001). In 106 AD the Nabataean kingdom was transformed to *Provincia Arabia*. Following the annexation, the Romans invested great efforts along the *Via Nova Trajana* and the *Limes Arabicus*, on the Jordanian plateau (Kennedy 1990, Graf 1995, 1997, Parker 2002). However, in the southern Negev we barely see indications of their presence.[52] Twenty five year after the annexation of Nabataea to the Roman empire, the Bar-Kochva revolt broke out. If the Romans were forced to transfer troops from Scotland and Dacia to fight against the Jews, and two full legions were annihilated during the revolt (Eck 1999), they certainly could not have left any troops in the southern Negev, probably not even in the entire Negev. Roman activity in the Negev was renewed in the time of Septimius Severus (193-211 AD), which also brought intensification of the Nabataean trade (Dolinka 2003:189-93, 2006:189-93; Erickson-Gini & Israel 2013:42).[53] However, shortly after his time the empire fell into a deep crisis, which had a profound impact on the Negev (Erickson-Gini 2007, 2010 Ch. 4). Only from the time of Diocletian, the very late 3rd century, can we see a significant renewal of Roman activity in the Negev, with the transfer of the *LEGIO X FRETENSIS* to Aila (Eusebius *On*. 6.17, 8.1-3, Notely & Safrai 2005:8; Lewin 2002:94-8). As the result of this act and other reforms of Diocletian, Aila experienced development, the Roman fortress at Yotvata was built (Meshel 1987; Roll 1987; Davis & Magness 2015) and a road in a 'Arabah was marked by milestones (Roll & Avner 2008). Nevertheless, beside Aila and the Yotvata fortress, we barely see Late Roman-Byzantine pottery sherds in the region, or other indications for the regime. On the other hand, the many dwelling tent camps in 'Uvda Valley and beyond, were certainly Nabataean (or 'Arabs), not Roman, and the public building continued in use by the tent dwellers, at least until the first half of the 3rd century. Occupation of the army tent camps, that guarded the ancient roads, also continued to that time. In the copper mines of Naḥal 'Amram, four of the ^{14}C dates fall in the mid-3rd century AD, the crisis time, when no Roman presence is expected in the region. Hence, the large-scale mining activity should be

[52] Dated to the annexation time is the inscription of the *LEG III CYR* from Wadi Tweibeh, mentioned above. It attests to a short presence of this Legion in the Aila region, on its way from Egypt to Bostra (Bowersock 1983:81,95, 105-6). Four Trajan coins from the Dafit fortress and one from Aila, mentioned above, also belong to this period.

[53] A recent discovery (February-March 2018) of an unknown section of the "Incense Road" is well connected to the Severan time. The new section, 8 km long, north of the Ramon Crater, was found between Mazad Maḥmal and Mazad Grafon, with six Roman milestone stations, up to three in each. On a few stones parts of inscriptions of this period were preserved (to be published by H. Ben-David and B. Isaak). The first group was found by Z, Sherzer and guides of the Sde Boqer Field School, the others were found by S. Raveq, H. Ben-David, L. Enmar, U. Avner and companions.

attributed to the Nabataeans, which continued mining at least until the early 5th century (see above). The irrigation system at Yotvata based on open pools operated at least until the late 4th century (the abandonment of the Roman fortress), if not until the Islamic era, when they were replaced by the *qanat*. In an excavation of a large hearth (1.2 m across and 50 cm deep) near Har Shani, north of Eilat, fine Nabataean pottery sherds and glass fragments were found, with two ^{14}C dates *ca*. 600 AD[54] (Avner 1982b). This may seem too late for Nabataean pottery, but in a number of sites in Jordan and northern Hejaz, pottery production in the Nabataean tradition continued up to the 6th century (Politis 2007:195, with references).

From all these sites and activities, the impression is that the Nabataeans managed to maintain their organizational frames long after they had no king or a government to tell them what to do: Economy continued with the organization of trade caravans, even with some military organization, (possibly under the Roman Army; Graf 1994), continuation of some social-economic organization of the farmers-herders in 'Uvda Valley, organization of large scale copper mining, maintenance of irrigation systems at Yotvata and the persistence of Nabataean tradition in the location-orientation of cult installations, the open church and the small mosque at Be'er Orah.

The scenario described here accords well with a number of studies, demonstrating the perpetuation of Nabataean ethnicity and culture during the Roman-Byzantine period (Abdul-Karim 1990; Graf 2004, 2007; Politis 2007) and still in the Early Islamic period (Ḥamarneh 1982, 1990). A question arises, what was the Nabataeans' source of power that enabled them to maintain their ethnicity, economy and culture, while other polities in the Near East disappeared? The answer may lay in their earlier history. The original culture of the Nabataeans was a desert one (*e.g*. Diodorus 19.94) and most of those who joined their "umbrella" were desert ethnic groups (Graf 2004). For them, high social coherence was essential for survival in the desert. Such tribes were usually lead by the "elders", an unofficial, but influential body, while individual leaders rose up from the tribe in a time of war or other crises (*cf*. the Bible, book of Judges; de Vaux 1961:3-15; LaBianca & Witzel 2007:68-9, with references; van der Steen 2009). Tribes had an established, but unwritten, law system,[55] and the code of behavior was well known to all, based on honor (*e.g*. Musil 1928, Chs. 6-10). In short, tribal social order was a strong cultural lore, rooted in the Nabataean history, as worded by Strabo (16.4.21): "*The king has a minister who is one of the Companions, and is called 'Brother'. They have excellent laws for the administration of public affairs. Athenodorus, a philosopher, and my friend, who had been at Petra, used to relate with surprise, that he found many Romans and also many other strangers residing there. He observed the strangers frequently engaged in lawsuits, both with one another and with the natives; but the natives had never any dispute amongst themselves and lived together in perfect harmony"*. He also wrote (16.4.26): "*The king courts popular favor so much, that he is not only his own servant, but sometimes he himself ministers to others. He frequently renders an account of his administration before the people, and sometimes an inquiry is made into his mode of life*". Possibly, the tribal tradition of social coherence and "*excellent laws"* helped the Nabataean to perpetuate their identity and organizational frames long after the cessation of their kingdom, despite that they were actually a 'conglomerate' of ethnic groups.

The Nabataean remains of the Eilat region, the hinterland of Aila, still await a thorough study, they have much to tell us.

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[54] Rt648f, 1470±60 BP, Rt648g, 1500±170 (Carmi 1987:104). Calibration by OxCal 4.3(109), the relative mean value is determined by the dominant pick in the calibration curve.

[55] Exceptional is the Hebrew law (Exodus, Leviticus and Numbers), written during the monarchy time but largely based on the desert lore.

BIBLIOGRAPHY

Abercrombie, T.J. 1991. Ibn Battuta, Prince of Travelers. *National Geographic* 180:2-49.

'Amer, Kh. and A. al-Momani. 1999. The Discovery of Two Additional Pottery Kilns at az-Zurraba/Wadi Musa. *Annual of the Department of Antiquities of Jordan* 43:175-194.

Abdul-Karim, M. 1990. Lexical, Historical and Literary Sources of the Nabataeans in the 'Arab Tradition. *Aram* 2:421-4.

Abel, F.M, 1938. *Géographie de la Palestine*, II. Paris.

Aharoni, Y. 1954. The Roman Road to Aila (Elath). *Israel Exploration Journal* 4:9-16.

Al-'Aref, 'A. 1937. *The Bedouin Tribes of the Be'er Sheva' District*. Tel Aviv. (Hebrew translation from 'Arabic- M. Kapelyuk).

Alt, A. 1935. Aus der 'Araba II. *Zeitschrift des Deutschen Palästina-Vereins*. 58:1-78.

Al-Ashmawi, F. 1998. Pottery Kiln and Wine-Factory at Burg El-'Arab. *Bulletin de Correspondence Hellenique,* Supp. 33:55-64.

Avitsur, S. 1966. *Implements for Harvesting and Similar Purposes Used in the Traditional Agriculture of Eretz Israel*. Tel Aviv. (Hebrew).

Arav, R. S. Filin and U. Avner. 2018. Volume and Mass Estimation of Mine Dumps and Slag Piles Using High-Resolution Terrestrial Laser Scans. In. Ben-Yosef, E. (ed). *Mining for Ancient Copper: Essays in Memory of Beno Rothenberg*. Tel Aviv. 178-187.

Avi-Yonah, M. 1954. *The Madaba Mosaic Map: With Introduction and Commentary*. Jerusalem.

Avni, Y., N. Porat, J. Plakht and G. Avni. 2006. Geomorphic Changes Leading to Desertification Versus Anthropomorphic Land Conservation in the Arid environment, The Negev Highlands, Israel. *SceinceDirect* 82:177-200.

Avner, U. 1972. Ancient Desert Roads and Rock Inscriptions. Tel Aviv (Hebrew booklet).

Avner, U. 1980. A Survey in the Yahel Area. *Ḥadashot Arkheologiyot* 74-5:50-51.

Avner, U. 1982a. Survey of Biq'at 'Uvda–Eilat Road. *Excavations and Surveys in Israel* 1:81–82.

Avner, U.1982b. Excavation of an Open Sanctuary at Har Shani. *Ḥadashot Arkheologiyot* 68-9:97-9 (Hebrew).

Avner, U.1990. Naḥal Re'uel, Tyche Ceramic Relief. *Excavations and Surveys in Israel* 9:175.

Avner, U.1997. Ancient Roads in the Arava. *Excavations and Surveys in Israel* 16:133-4.

Avner, U. 1998. Settlement, Agriculture, and Paleoclimate in 'Uvda Valley, Southern Negev Desert, 6th - 3rd Millennia B.C. In. A. Issar and N. Brown (eds.), *Water, Environment and Society in Times of Climate Change*. Pp. 147-202. Dordrecht.

Avner, U. 2000. Nabatean Standing Stones and Their Interpretation. *Aram* 11-12:95-120.

Avner, U. 2002. *Studies in the Material and Spiritual culture of the Negev and Sinai Population, During the 6th-3rd millennia B.C*. Ph.D. dissertation, The Hebrew University, Jerusalem. http://www.adssc.org/sites/default/files/PhD-Uzi-RS.pdf.

Avner, U. 2007. Bedouin Cultural Remains in the Eilat Region. In. E. van der Steen & B. Saidel (eds) *On the Fringe of Society: Archaeological and Ethnoarchaeological Perspectives on Pastoral and Agricultural Societies*. BAR International Series. 1657:112-146.

Avner, U. 2008. Eilat Region. In, A. Stern (ed.). *The New Encyclopedia of Archaeological Excavation in the Holy Land*, Volume 5 (Supplementary). Jerusalem. 1704-1711.

Avner, U. 2013. The Nabataean Trade Routes, Caravans and Goods. In, U. Avner (ed), *The Second Eilat Conference: Eilat and the Negev- A Bridge Between Cultures and Peoples*, *Eilat, March 13-15. Book of Abstracts*. Eilat, 8-9.

Avner, U. 2014a. Archaeological Surveys in the Eilat Region. *Qadmoniot*. 148:110-120 (Hebrew).

Avner, U. 2014b. Egyptian Timna- Reconsidered. In. J. Tebes (ed). *Unearthing the Wilderness: Studies on the History and Archaeology of the Negev and Edom in the Iron Age*. Leuven. 103-163.

Avner, U. 2015. The Nabateans in Sinai. *Aram* 27:399-432.

Avner, U. 2016a. Desert Farming in the Southern 'Araba Valley, Israel, 2nd Century B.C. to 11th Century A.D. In, A. Davies, F. Retamero and I Schjellerup (eds). *Agriculture and Pastoral landscapes in Pre-Industrial Societies: Choices, Stability and Change*. Oxford. 19-36.

Avner, U. 2016b. Ancient Roads in the ‘Araba, *The Dead Sea and ‘Arava Studies* 8:25-44 (Hebrew).

Avner, U. 2018. Protohistoric Developments of Religion and Cult in the Negev Desert. *Tel Aviv* 45:23-62.

Avner, U.and I. Roll. 1996. Roman Milestones and Ancient Roads in the ‘Araba Valley. *American Journal of Archaeology* 100:762-764.

Avner, U. and J. Magness. 1998. Early Islamic Settlement in the Southern Negev. *Bulletin of the America School of Oriental Research*. 310:39-57.

Avner, U., H. Ginat, S. Shalev, S, Shilstine, B. Langford, A. Frumkin, R. Shem-Tov, S. Pilin, R. Arav U. Basson, O. Shamir and L. Scott-Cummings. 2018. Ancient Copper Mines at Nahal ‘Amram, Southern ‘Araba: A New Research. In, E. Ben-Yosef (ed.) *Mining for Ancient Copper: Essays in Memory of Beno Rothenberg*. Tel Aviv: Institute of Archaeology of Tel Aviv University. 147-177.

Avni, G. 1994 Early Mosques in the Negev Highlands: New Archaeological Evidence on Islamic Penetration of Southern Palestine. *Bulletin of the American Schools of Oriental Research* 294: 83-100.

Avni, Y, N. Porat and G. Avni. 2012. Pre-farming Environment and OSL Chronology in the Negev Highlands, Israel. *Journal of Arid Environments*. 86:12-27.

Barkay, R. 2011. The Earliest Nabataean Coinage. *The Numismatic Chronicle* 171:67-73.

Barkay, R. 2015. New Aspects of Nabataean coins. *Aram* 27:431-9.

Barkay, R. 2016. The Coinage of the Nabataean King Obodas II (c. 30-9 BC). *The Numismatic Chronicle* 179:83-109.

Bashear, S. 1991. *Qibla Musharriqa* and Early Muslim Prayer in Curches. *The Muslim World* 81:267-282).

Ben-David, H. 2013. The ancient Routs from Petra to the Wadi ‘Arabah. In. P. Kouki and M. Lavento (eds). *Petra- The Mount of Aaron, the Finish Archaeological Project in Jordan*, Vol. 3:273-80

Ben-Yosef, E., L. Tauxe, H. Ron, A. Agnon, U. Avner, M. Najjar, T. Levy a 2008. A New Approach for Geomagnetic Archaeointensity Research: Insights on Ancient Metallurgy in the Southern Levant. *Journal of Archaeological Sciences* 35: 2863–2879.

Ben-Yosef, E.; R. Sha‘ar, L. Tauxe,. and H. Ron. 2012. A New Chronological Framework for Iron Age Copper Production in Timna (Israel). *Bulletin of the American Schools of Oriental Research* 367: 31–71.

Ben-Yosef, E., 2016. Back to Solomon’s Era: Results of the First Excavations at Slaves’ Hill (Site 34, Timna, Israel). *Bulletin of the American Schools of Oriental Research*. 376:169-198.

Ben-Yosef, E., D. Langgut and L. Sapir-Ḥen. 2017. Beyond Smelting: New insights on Iron Age (10th c. BCE) Metalworkers Community from Excavations at a Gatehouse and Associated Livestock Pens in Timna, Israel. *Journal of Archaeological Science* 11:411-426.

Ben-Yosef, E., 2018. The Central Timna Valley Project: Research, Design and Preliminary results. In, E. Ben-Yosef (ed.) *Mining for Ancient Copper: Essays in Memory of Beno Rothenberg*. Tel Aviv: Institute of Archaeology of Tel Aviv University. 29-63.

Berggren, J.L. and A. Jones. 2000. *Ptolemy's Geography: An Annotated Translation of the Theoretical Chapters*. Princeton and Oxford.

Betlion J.W. 2001. The Coins from the Roman ‘Aqaba Project, 1994-2000. The ASOR Annual Meeting. Boulder Colorado (a handout).

Bienkowsky, P. 2006. The Wadi ‘Arabah: Meanings in a Contested Landscape. In. P. Bienkowsky and K. Galor. *Crossing the Rift: Resources, Routes, Settlement Pattern and Interaction in the Wadi ’Arabah*. Oxford.

Bigansca, A. 1996. *Petra, EZ-Zantur I: Ergebnisse der Schweizrisch-Liechtensteinischen Ausgrabungeb 1988-1992*. Mainz am Rhein.

Bowersock, G.W. 1983. *Roman Arabia*. Harvard.

Braslavi, J. 1952. *To Eilat and the Red Sea*. Tel Aviv (Hebrew).

van den Brink, E. 2016. Lod (Neve Yaraq): A Late Roman Pottery Kiln and Pottery Neolithic A (Jrticho IX/ Lodian) Remains. ‘*Atoqot* 85:1-36.

Brünnow, R.E., und A. Domaszewski. 1909. *Die Provincia Arabia* III. Strassburg.

Burckhardt, J.L. 1822. *Travels in Syria and the Holy Land*. London.

Burleigh, R. and A. Hewson. 1979. British Museum Natural Radiocarbon Measurements XI. *Radiocarbon*

21(3):339-352
Carmi, I. 1987. Rehovot Radiocarbon Measurements III. *'Atiqot* 29:100-14..
Cartari, V. 2012. *Images of the Gods of the Ancients:The First Italian Mythography*. Translated from Italian by J. Mulryan. Tempe.
CIS II. 1907. *Corpus Inscritionum Semiticarum,* Tom. II 1-3. Paris
Cohen, R. 1980a. Excavation of Site 3 in 'Uvda Valley. *Ḥadashot Arkheologiyot* 64-5:36-7 (Hebrew).
Cohen, R. 1980b. Excavation of Site 13 in 'Uvda Valley. *Ḥadashot Arkheologiyot* 74-5:42-3 (Hebrew).
Cohen, R. 1983. Be'er Menuḥah. *Ḥadashot Arkheologiot* 83:70-71 (Hebrew).
Cohen, R. 1984. Ḥorvat Dafit. *Eexcavations and Surveys in Iarael* 3: 16-17.
Cohen, R. 1987. New Light on the Date of the Petra-Gaza Road. *Biblical Archaeologist* 45:240-46.
Cohen, R. 1994. The Fortresses at 'En Ḥaseva. *Biblical Archaeologist*. 57:203-14.
Cohen, R. and Y. Israel. 1995. *On the Road to Edom, Discoveries from 'En Ḥazeva*. Jerusalem.
Dalman, G. 1908. *Petra und Seine Felsheiligtümer*. Leipzig.
Dalman, G. 1912. *Neue Petra-Forschungen un der heilige Felsen von Jerusalem*. Leipzig:
Davis, G. and J. Magness. 2015. *The 2003-2007 excavations in the Late Roman Fort at Yotvata*. Winona Lake.
Diodorus. *Bibliotheca Historica* VI. Translated by E. Cary. Loeb Classical Library. 1917. London.
Di Segni, L., Y. Tzafrir, J. Green and J. Patrich. 2017. *The Onomasticon of Iudaea-Palaestina and Arabia in Greek and Latine Sources*. Vol II (1). Jerusalem.
Dolinka, B., 2003. *Nabataean Aila ('Aqaba), Jordan, from a Ceramic Perspective: Local and international trade in 'Aqaba*. BAR International Series 1116.
Dolinka, B., 2006a. The Rujum Taba Archaeological Project (ERTAP) Results of the 2001 Field Survey and Reconnaissance. In P. Bienkowski and K. Galor (eds). *Crossing the Rift,* Oxford. 195-214.
Dolinka, B., 2006b. *Arabia Adquisita? Ceramic Evidence for Nabataean Cultural Continuity During the Antonine and Severan Periods: The 'Aqaba Ware from Horvat Dafit*. Ph.D. Dissertation (unpublished). University of Liverpool.
Eck, W. 1999. The Bar-Kokhba Revolt: The Roman Point of View. *Journal of Roman Studies* 89:76-89.
Erickson-Gini, T. 2007. The Nabataean-Roman Negev in the Third Century CE. In. A. Lewin and P. Pellegrini (eds). *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceeding of a colloquium held in Potenza, Acerenza and Matera, Italy 10-15.5.2005*. Oxford:
Erickson-Gini, T. 2010. *Nabataean Settlement and Self-Organized Economy in the Central Negev: Crisis and Renewal*. BAR International Series 3054. Oxford.
Erickson-Gini 2012a. Nabataean Agriculture: Myth and Reality. *Journal of Arid Environment* 86:50-54.
Erickson-Gini 2012b. 'Ein Yotvata. *Ḥadashot Arkheologiot* 124. http://www.hadashot-esi.org.il/report_detail_eng.aspx?id=1960&mag_id=119
Erickson-Gini, T. and Y. Israel. 2013. Excavating the Nabataean Incense Road. *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 1:24-53.
Evenari, M, Shanan, L. and Tadmor, N. (1959). The Ancient Agriculture of the Negev: Chain Well Systems in the Wadi Arava. *Ktavim* 9:223-39.
Evenari, M., L. Shanan and N. Tadmor. 1971. *The Negev, The Challenge of the Desert*. London.
Facey, W. 2004. The Red Sea: The Wind Regime and location of Ports. In, P. Lunde and A. Porter (eds) Trade and Travel in the Red Sea Region. Proceeding of the Red Sea Project 1, held in the British Museum, October 2002. BAR International Series 1269:7-17.
Figueras P. 2004. Greek Inscriptions from Nessana. *Beer-Sheva* 17:222-240.
Fima, Z. and R. Johns 1990. The Nabataean King-List: Further Observations on the Second Nabataean Inscription from Tell esh-Shuqafiya, Egypt. *Annual of the Department of Antiquities of Jordan* 34:238-48.
Frank, F. 1934. Aus der 'Araba I. *Zeitschrift des Deutschen Palästina-Vereins*. 57:191-280.
Gichon, M. 1971. The Military Significance of Certain Aspects of the Limes Palestinae. In: Gichon, M. (Ed.). Roman Frontier Studies, 1967. Proceeding of the 7th International Congress. Tel Aviv. pp. 86–92.
Gichon, M. 1980. Research on the Limes Palestinae: A stocktaking. In: Hanson, W. S., Keppie, L. J. (Eds.). Roman Frontier Studies 1979. Papers Presented to the 12th International Congress of the Roman

Frontier Studies. BAR International Series 71, pp. 843–864.
Gichon, M. 1997. The Strategic Conception and the Tactic Functioning of the Limes Palestinae after the Diocletian reorganisation. In: van Waateringe, W. G. van Beek, B. L. Willems, W. I. Wynia, S. L. (Eds.). Roman frontier studies 1995: Proceeding of the XVI[th] International Congress of Roman Frontier Studies. Oxford. pp. 25–31.
Gichon, M. 2002. Forty-Five Years of Research on the Limes Palaestinae: The Finding and Their Assessment in the Light of the Criticism Raised. In: Freedman, P., Bennett, J., Fiema, Z. T. Hoffmann, B. (Eds.). Limes XVIII: Proceeding of the XVIII[th] International Congress of Roman Frontier Studies Held in 'Amman, Jordan (Sep. 2000). BAR International Series 1084. Oxford. pp. 185–206.
Glueck, N. 1934. Explorations in Eastern Palestine I. *Annual of the American School of Oriental Research* 14:1-114.
Glueck, N. 1935. Explorations in Eastern Palestine II. *Annual of the American School of Oriental Research* 15:1-202.
Glueck. N. 1939. Explorations in Eastern Palestine III. *Annual of the American School of Oriental Research* 18-19.
Glueck, N. 1966. *Deities and Dolphins*. New York.
Goren, Y. and P. Fabian. 2008. The Oboda Potter's Workshop Reconsidered. *Journal of Roman Archaeology* 21:341-351.
Graf, D.F. 1995. *Via Nova Traiana* in Arabia Petraea In, J.H. Humphrey (ed) *The Roman and Byzantine Near East, Some Recent Archaeological Researches*. Ann Arbor. 241-78.
Graf, D. 1994. The Nabataean Army and the *Cohortes Ulpiae Petraeorum*. In, E. Dabrowa (ed). *The Roman and Byzantine Army in the East, Proceedings of a Colloqium Held at the Jagiellonian University, Krakow, September 1992*. Krakow. 265-311.
Graf, D.F. 1997, The Via Militaris and the Limes Arabicus. In, W. Groenman-van Waateringe (ed) *Roman Frontier Studies. Proceeding of the 16th International Congress of Roman Frontier Studies* 1995:123-34.
Graf, D. 2004. Nabataean Identity and ethnicity: The Epigraphic Perspective. *Studies in the History and Archaeology of Jordan* 8:145-54.
Graf, D. 2005. The Hellenistic Petra project: Excavations in the Civic Center, Preliminary Report of the First Season, 2004. *Annual of the Department of Antiquities of Jordan* 49:417-41.
Graf, D.F. 2006, The Nabataeans in the early Hellenistic period: the testimony of Posidippus of Pella, *Τοποι: Orient-Occident* 14:47-68.
Graf, D. 2007a. The Nabataeans Under Roman Rule (After AD 106). In, K.D. Politis (ed.), *The World of the Nabataeans*. Stuttgart. Vol.2:173-186.
Graf, D. 2007b. The Hellenistic Petra project: Excavations in the Qasr al-Bint Themenos area Preliminary Report of the First Season, 2005. *Annual of the Department of Antiquities of Jordan* 51:223-38.
Grant, P.C. 1937. *The Syrian Desert: Caravans, Travel and Exploration*. London
Grawehr, M. 2006. Petra, *Ez-Zantur III: Die Lampen der Grabungen auf ez-Zantur, in Petra*. Mainz am Rhein.
Grawehr, M. 2010. *Petra, Ez-Zantur IV: Ergebnisse der Schweizrisch-Liechtensteinischen Ausgrabungeb: Eine Bronzwerkstatt des 1. jhr n. Chr von ez-Zantur in Petra/Jordanien*. Mainz am Rhein.
Haiman, M. 1995. The Early Islamic Period Farm at Naḥal Mitnan in the Negev Highlands. *Atiqot* 26:1-13.
Ḥaimi. Y. 2026. Excavation in a Water Pool Near Yotvata.*Hadashot Arkheologiot* 128 http://www.hadashot-esi.org.il/report_detail.aspx?id=25134&mag_id=124
Ḥamarneh, S. 1982. The Role pf the Nabataean in the Islamic Conquest. *Studies in the History and Archaeology of Jordan* I:347-51.
Ḥamarneh, S. 1990. The Nabataean After the Decline of their Political Power. *Aram* 2:425-36.
Hammond P. 1978. Excavations at Petra, 1975–1977. *Annual of the Department of Antiquities of Jordan* 22:81-101, 229–46.
Hammond P. 1996. *The Temple of the Winged Lions (Petra, Jordan), 1973-1990*. Fountain Hills.
Hauptmann, A., Khalil, L. and Schmidt-Strecker, S. 2009. Evidence of Late Chalcolithic/Early Bronze Age

I Copper Production from Timna Ores at Tell al-Magass, ‘Aqaba. In: Khalil, L. and Schmidt, C., eds. *Prehistoric ‘Aqaba I*. Berlin. 295-304.

Healey, J.F. 2001. *The Religion of the Nabataeans*. London.

Hershkovitz, I. 1988a. The Tell Maḥrad Population in Southern Sinai in the Byzantine Era. *Israel Exploration Journal* 38:47-58.

Horowitz, L.K. and U. Avner. 2018. Miners Meal in the Copper Mines of Naḥal ‘Amram, Southern Israel. In. Ben-Yosef, E. (ed). *Mining for Ancient Copper: Essays in Memory of Professor Beno Rothenberg*. Tel Aviv. 199-216.

Hull, E. and H.H. Kitchener. 1885. *Mount Seir. Sinai and Western Palestine*. London.

Israel, Y. and Naḥlieli, D. 1982 ‘En Rahel. *Israel Exploration Journal* 32:163.

Israel, Y. 2009. Excavation at Be’er Orah. *Ḥadashot Arkheologiot* 121. (http://www.hadashot-esi.org.il/report_detail_eng.aspx?id=1137&mag_id=115.

Jaussen, A. and R. Savignac. 1909. *Mission Archéologique en Arabie*. Paris.

Jean, C.F. and J. Hoftijzer. 1965. *Dictionnaire des Inscriptions Semitiques de L’Ouest*. Leiden.

Joukowsky, M.S. 2002. The Petra Great Temple: A Nabataean Architectural Miracle. *Near Eastern Archaeology* 65:235-49.

Karmon, Y. 1968. The Geopolitical Position of Eilat in Historical Perspective. *Studies in the Geography of Israel* 6:53-80.

Keller, D. and M. Grawehr. 2006. Petra Ez-Zantur III: *Ergebnisse der Schweizrisch-Liechtensteinischen Ausgrabungeb. Mainz am Rhein*.

Kennedy, D. 1990. *Rome’s Desert Frontier from the Air*. London.

Keteraer, A. and A. Hauptmann. 2016. In the Shadow of Timna? The Mining Region of Wadi ‘Amram, New Analytical and Archaeological Aspects. *Metalla* 22:196-83.

Kirk, G. E., 1938. Archaeological exploration in the Southern Desert. *Palestine Exploration Quarterly* 71, 211–234.

Kirk. G. and P. Gignoux. 1996. Greek Funerary Inscriptions and Ostraca from Elusa. *Atiqot* 28:171-192.

Klimscha, F. 2013. Innovations in Chalcolithic Metallurgy in the Southern Levant during the 5th and 4th Millennum BC: Copper-Production at Tell Ḥujayrat al-Ghuzlan and Tell al-Magass, ‘Aqaba Area, Jordan. In: Burmeister, S., Hansen, S., Kunst, M. and Müller-Scheeßel, N. (eds). *Metal Matters: Innovative Technologies and Social Changes in Prehistory and Antiquity*. Rahden.

Kollmann, E.D. 1972. A Soldier’s Joke or Epitaph? *Israel Exploration Journal* 22:145-6.

Korjenkov, A.M. and Erickson-Gini, T. 2003. The Seismic Origin of the Destruction of the Nabataean Forts of Ein Erga and Ein Rahel, Arava Valley, Israel. *Archäologischer Anzeiger* 2:39–50.

McKenzie, J. 1990. The Architecture of Petra. Oxford.

LaBianca, Ø, and K.R. Witzel. 2007. Nomades, Empires and Civilizations: Great and Little Traditions and the Historical Landscape of the Southern levant. In. E. van der Steen & B. Saidel (eds) *On the Fringe of Society: Archaeological and Ethnoarchaeological Perspectives on Pastoral and Agricultural Societies*. BAR International Series. 1657:63-74.

de Laborde, I. 1830. *Voyage de l'Arabia Petree*. Paris.

Lambton, A. K. S. (1992). The Qanats of Yazd. *Journal of the Royal Asiatic Society* 3:21-35.

Lawrence 1935 (1926). *Seven Pillars of Wisdom*. New York.

Levi della Vida. G. 1938. Una bilingue greco-nabatea a Coo. *Clara Rhodos* 9: 139-48.

Lindner, M., U. Hübner, and J. Hübl. 2000. Nabataean and Roman Presence Between Petra and Wadi Arabah Survey Expedition 1997/98: Umm Ratam. *Annual of the Department of Antiquities of Jordan* 44: 535-567.

Marx, E. 1967. *Bedouin of the Negev*. Manchester.

Melkawi, A., A. ‘Amr and D. Whitcomb. 1994. The Excavation of Two Seventh Century Pottery kikn at ‘Aqaba. *Annual of the Department of Antiquities of Jordan* 38:447-68.

Meshel, Z. 1990. *Yotvata Oasis, Its History, Landscape and Sites*. Eilot. (Hebrew).

Meshel, Z. 2000. Excavations at the Dahab Fortress on the Eastern Coast of the Southern Sinai. In, Z. Meshel, *Sinai, Excavations and Studies*. BAR *International Series* 876. Oxford. 18-47.

Meshel, Z. and Y. Tsafrir. 1975. The Nabataean Road from ‘Avdat to Sha‘ar Ramon. Part II. Palestine

Exploration Quarterly 105:1-20.
Mouterde, R. 1954. La *statio ad Dianam du portorium* de Syria près le golfe d'Aqaba. *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*. 98:482-487. https://www.persee.fr/doc/crai_0065-0536_1954_num_98_4_10350#
Musil, A. 1908. *Arabia Petraea II*: Edom. Wien.
Musil, A. 1928. *The Manners and Customs of the Rwela Bedouins*. New York.
Nagar, Y. and F. Sonntag 2008. Byzantine period Burial in the Negev: Anthropological Description and Summary. *Israel Exploration Journal* 58:79-93.
Naveh, J. 1970. Sinaitic Notes. In. S. Abramsky (ed). *Shmuel Yevin Festschrift*. 371-4 (Hebrew).
Naveh, J. 1979. A Nabataean Incantation Text. *Israel Exploration Journal* 29:111-19.
Naveh, J. 1982. *Early History of the Alphabet*. Jerusalem.
Nebenzahl, K. 1986. *Maps of the Holy Land*. New York.
Negev, A. 1974. *The Nabataean Potter's Workshop at Oboda*. Acta Supplementa 1. Bonn.
Negev, A. 1977. *The Inscription of Wadi Haggag, Sinai*. Qedem 6. Jerusalem.
Negev, A. 1978. The Greek Inscriptions from 'Abdat (Oboda). *Liber Annuus* 28:87-126.
Negev, A. 1988. *The Architecture of Mampsis, Final Report, Vol. I. The Middle and Late Roman and Byzantine Periods*. Qedem 27. Jerusalem.
Negev, A. 1991. *Personal Names in the Nabataean Realm*. Qedem 32. Jerusalem.
Nehmé, L. 2014. *Atlas archéologique et épigraphique de Pétra. Fascicule 1. De Bāb as-Sīq au Wādī al-Farasah*. Paris.
Nehmé, L., W. Abu-Azizeh, T. Bauzou, C. Durand, J. Rohmer, I. As-Sabban, N. Delhopital, K. Alhaiti, M, Al-Musa, and Y. Gerber. 2015. Report on the Fifth Season (2014) of the Madâ'in Saliḥ Archaeological Project. *HAL archives ouvertes*, March 2015. https://halshs.archives-ouvertes.fr/halshs-01122002
Nehmé, Kh. Alhaiti, T. Bauzou, P-M. Blanc, P. Dal-Prà, C. Durand, D. Gazagne, Z.T. Fiema, Y. Gerber, and L. Hapiot. 2017. Madâ'in Saliḥ Archaeological Project. Report on the 2016 Season. *HAL archives ouvertes,* May 2017. https://hal.archives-ouvertes.fr/hal-01518460
Netzer, E. 2003. *Nabataische Architektur*. Mainz am Rhein.
Notley, R.S. and Z. Safrai, 2005. *Onomasticon: The Names of Divine Scripture, Including Latin Adition of Jerome*. Boston.
Parker, T. 1986. *Romans and Saracens: A History of the Arabian Frontier*. ASOR Dissertation 6. Winona Lake.
Parker, T. 1996. The Roman 'Aqaba Project: The 1994 Campaign. *Annual of the Department of Antiquities of Jordan* 40:231-57.
Parker, T. 1997. Preliminary Report on the 1994 Season of the Roman 'Aqaba Project. *Bulletin of the American Schools of Oriental Research* 305:19-44.
Parker, T. 1998. The Roman 'Aqaba Project: The 1996 Campaign. *Annual of the Department of Antiquities of Jordan* 42:375–394.
Parker, T. 2000. The Roman 'Aqaba Project: The 1997 and 1998 Campaigns. *Annual of the Department of Antiquities of Jordan* 44:373-94.
Parker, T. 2002. The Roman Frontier in Jordan: an Overview. In, P. Freeman, J. Bennett, Z. Fiema and B. Hoffmanm. *Limes XVIII, Proceeding of the XVIII International Congress of Roman Frontier Studies Held in Amman, Jordan (September 2000)*. BAR International Series 1084 (1). Oxford.
Parker, T. 2003. The Roman 'Aqaba Project: The 2002 Campaign. *Annual of the Department of Antiquities of Jordan* 47:321-33.
Parker, T. 2006. Roman Aila and the Wadi 'Arabah: An Economic Relationship. In, P. Bienkowski and K. Galor (eds). *Crossing the Rift,* Oxford. 223-230.
Parker, T. 2007. Beyond Frankincense and Myrrh: Reconstructing the Economy of Roman 'Aqaba. In. T. Levy, P.M. Michele Daviau, R. Younker and M. Shaer (eds). *Crossing Jordan: North American Contribution to the Archaeology of Jordan*. London359-66.
Parker, T. 2013. The Foundation of Aila: A Nabataean Port on the Red Sea. *Studies in History and Archaeology of Jordan* 10:685-90.
Petherick, J. 1861. *Egypt, the Sudan and Central Africa*. Edinburgh:

Peters. F.E. 1994. The Hajj: *The Muslim Pilgrimage to Mecca and to Holy Places*. Princton.

Plini. *Naturalis Historiae*. Translated by H. Rackham, Loeb Classical Library, Vols. II, IV, 1942, 1945.

Politis K.D. 2007. Nabataean Cultural Continuity into the Byzantine period. In. K.D. Politis (ed). *The World of the Nabataeans*. Stuttgart.

Porath, J. 1985. *Ancient Irrigation Agriculture in the Arid Zone of Eretz Israel*. Unpublished Ph.D. Thesis. University of Tel Aviv (Hebrew).

Porat, J. 1987. Tunnel Wells in the 'Araba. *Qadmoniot* 97-80:106-114 (Hebrew).

Porath, J. 2016. Tunnel Wells and Early Islamic Settlements in the 'Araba. *Atiqot* 86:1*-82* (Hebrew).

Power, T. 2012. *The Red Sea from Byzantium to the Caliphate: AD 500–1000*. Cairo, New York.

Pratico, G.D. 1993. *Nelson Glueck's 1938-1940 Excavations at Tell el-Kheleifeh, a Reappraisal*. Atlanta.

Raikes, T. 1976. *Ancient Sites in the Wadi Araba and Nearby*. (Unpublished report).

Ramsey, J. and T. Parker. 2016. A Diachronic Look at the Agricultural Economy at the Red Sea Port of Aila: An Archaeobotanical Case for Hinterland Production in Arid Environments. *Bulletin of the American Schools of Oriental Research* 376:101-120.

Retzleff, A., 2003. A Nabataean and Roman Domestic Area at the Red Sea Port of Aila. *Bulletin of the American School of Oriental Research* 331:45–65.

Robinson, E. 1856. *Biblical Researches in Palestine*. London.

Robinson, E. and E. Smith. 1856. *Biblical Researches in Palestine and the Adjacent Regions: A Journal of Travels in the Years 1838-1852*. London.

Rohmer J. and G. Charloux. 2015. From Liḥyān to the Nabataeans: Dating the End of the Iron Age in Northwestern Arabia. *Proceedings of the Seminar for Arabian Studies* 45: 297–320.

Roll, I. 1989. A Latine Imperial Inscription from the Time of Diocletian Found at Yotvata, *Israel Exploration Journal* 39:239-260.

Roll, I. and U. Avner. 2008. Tetrarchic Milestones Found Near Yahel, in the Southern Aravah. *Zeitschrift für Papirology und Epigraphy*. 165l:267-286.

Rothenberg, B. 1962. Ancient Copper Industries in the Western Arabah. *PEQ* 94:5-71.

Rothenberg, B. 1967a. Archaeological Sites in the Southern 'Araba and the Eilat Mountain. In Z. Ron (ed.), *Survey of the Eiloth Region*. Pp. 283-331. Eiloth. (Hebrew).

Rothenberg, B. 1967b. *Negev: Archaeology in the Negev and the Arabah*. Ramat Gan (Hebrew).

Rothenberg, B. 1970. An Archaeological Survey of South Sinai, First Season 1967/1968. *PEQ* 102:4-29.

Rothenberg, B. 1972. *Timna, Valley of the Biblical Copper Mines*. London.

Rothenberg, B. 1990. The Chalcolithic Copper Smelting Furnace in the Timna Valley- Its Discovery and the Strange Argument Surrounding Its Dating. *Institute for Archaeo-Metallurgical Studies* 15/16:9-12.

Rothenberg, B. 1999. Archaeo-Mettallurgical Researches in the Southern Arabah 1959-1990. Part 1: Late Pottery Neolithic to Early Bronze IV. *Palestine Exploration Fund Quarterly* 131:149-175.

Rothenberg, B. and J. Merkel. 1998. Chalcolithic, 5th Millennium B.C., Copper Smelting at Timna. *IAMS* 20:1-3.

Sapir-Ḥen, L and E. Ben-Yosef, 2014. The Socioeconomic Status of Iron Age Metalworkers: Animal Economy in the 'Slaves' Hill', Timna, Israel. *Antiquity* 88:775-790.

Sapir-Ḥen, L., O. lerman and E. Ben-Yosef, 2018. The Diet of Ancient Metal Workers: The Late Bronze Age and Early Iron Ages in the 'Arabah Valley (Timna and Faynan). In E. Ben-Yosef (ed.) *Mining for Ancient Copper: Essays in Memory of Beno Rothenberg*. Tel Aviv: Institute of Archaeology of Tel Aviv University. 81-108.

Schmidt, S. and B. Kolb. 2000. *Petra, Ez-Zantur II: Ergebnisse der Schweizrisch-Liechtensteinischen Ausgrabungeb. Mainz am Rhein*.

Schmidt, S. 2005. Book Review: B. Dolinka. *Nabataean Aila ('Aqaba), Jordan, from a Ceramic Perspective… Bulletin of the American School of Oriental Research* 340:97-9.

Segal, D. and I. Carmi. 1996. Rehovot Radiocarbon Date List V. '*Atiqot* 29:79-106.

Sharon, M., Avner, U.; and Naḥlieli, D. 1996. An Early Muslim Mosque Near Be'er Ora in the Southern

Negev: Possible Evidence for an Early Eastern Qiblah? *'Atiqot* 30: 107-14.
Sherzer, Z. 2010. *Deterioration of the Springs in the 'Arava Valley: Evalluation of Each Spring in Environmental and Anthropogenic Context*. M.A. Thesis, Ben Gurion University, Be'er Sheva.
Smith, A.M. 2005. Pathways, Roadways and Highways: Networks of Communication and exchange in the Wadi Araba. *Near Eastern Archaeology* 68:180-89.
Smith, A. M., 2010. *Wadi 'Arabah in Classical and Late Antiquity: An Historical Geography*. BAR International Series 2173. Oxford.
Sourdel, D. 1952. *Les cultes du Hauran a l' époque Romaine*. Paris.
Starcky, J. 1979. Les inscription Nabatéenne du Sinai. *Le Monde de la Bible* 10:206-235.
van der Steen, E. 2009. Tribal societies in the nineteenth century: a model. In, J. Szuchman (ed) *Nomads, Tribes, and the State in the Ancient Near.* Chicago. 105-118.
Stone, M.E. (ed.). 1992a. *Rock Inscriptions and Graffiti Project. Catalogue of Inscriptions,* Vol. 1, #1-3000. Atlanta.
Stone, M.E. (ed.). 1992b. *Rock Inscriptions and Graffiti Project. Catalogue of Inscriptions,* Vol. 2, #3001-6000. Atlanta.
Stone, M.E. (ed.). 1994. *Rock Inscriptions and Graffiti Project. Catalogue of Inscriptions,* Vol. 3, #6001-8500. Atlanta.
Strabo. *Geographica* VII. Translated by Jones, H. L. Loeb Classical Library. 1916. London.
Svetlana, T. 2013. Metzad Mazal. *Hadashot Arkheologiot* 125. http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?print=nopic&id=5451
Tzafrir, Y. 1988. *The Excavations at Rehovot-in-the Negev, Vol. I, the Northern Church*. Qedem 25. Jerusalem.
Ustinova, Y. and P. Figueras. 1996. A New Greek Funerary Inscription from Be'er Sheva. *Atiqot* 38:167-70.
De Vaux, R. 1961. *Ancient Israel: Its Life and Institution*. London.
Swanson, M.N. 2008. Obscure Text, Illuminating Conversation: Reading the Martyrdom of 'Abd al-Masih (Qays al-Ghassani). *Currents in Theology and Mission* (October 1, 2008). http://www.thefreelibrary.com/Obscure+text+illuminating+conversation%3A+reading+The+Martyrdom+of...-a0186594231
Wenning, R. 1996. Hegra and Petra: Some Differences. *Aram* 8:253-67.
Wenning, R. 2009. The message of the Khirbat at-Tannur Reliefs. *Studies in the History and Archaeology of Jordan* 10:577-84.
Whitcomb D. 1988. Aqaba: *'Port of Palestine on the China Sea'*. Amman (booklet).
Whitcomb D. 1994. Ayla: *Art and Industry in the Islamic port of Aqaba*. Chicago (booklet).
Whitcomb D. 1998. Out of Arabia: Early Islamic 'Aqaba in its Regional Context. In, R-P. Gayraud (ed). *Colloque international d'archéologie islamique*. Cairo. 403-418.
Willies L. 1990 Exploring the Ancient Copper Mines of the Wadi 'Amram (Southern 'Araba), *Institute for Archaeo-Metallurgical Studies* 15–16: 12–15.
Woolley, C.L. and T.E. Lawrence. 1915. *The Wilderness of Zin*. London.
Wulff, H. E. 1968. The Qanats of Iran. *Scientific American* 218: 94–105.
Yazdi, A.A.S., and M.L. Khaneiki. 2017. *Qanat knowledge, Construction and Maintenance*. Dordrecht.
Zayadin, F. 1982. Recent Excavations at Petra. *Annual of the Department of Archaeology of Jordan* 26:265-93.

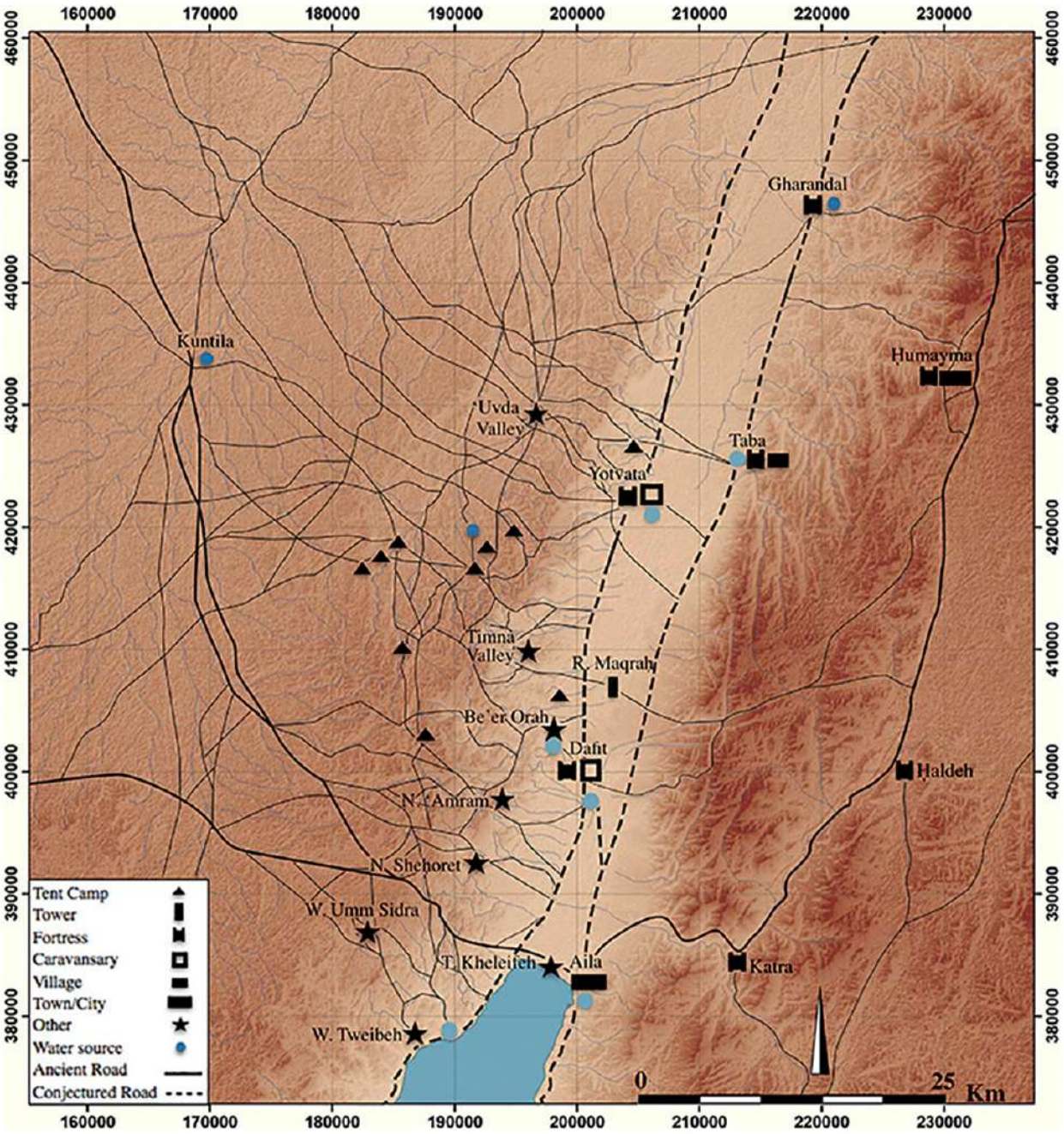


Figure 1. Map of sites in the Eilat region mentioned in this article and the ancient roads.

Figure 2. Pottery kiln in Naḥal Sheḥoret, horizontal view from south, and vertical.

Figure 3. Nabataean oil lamp and fragments produced in Petra in the 4th century AD, from a copper mine outside Timna Valley.

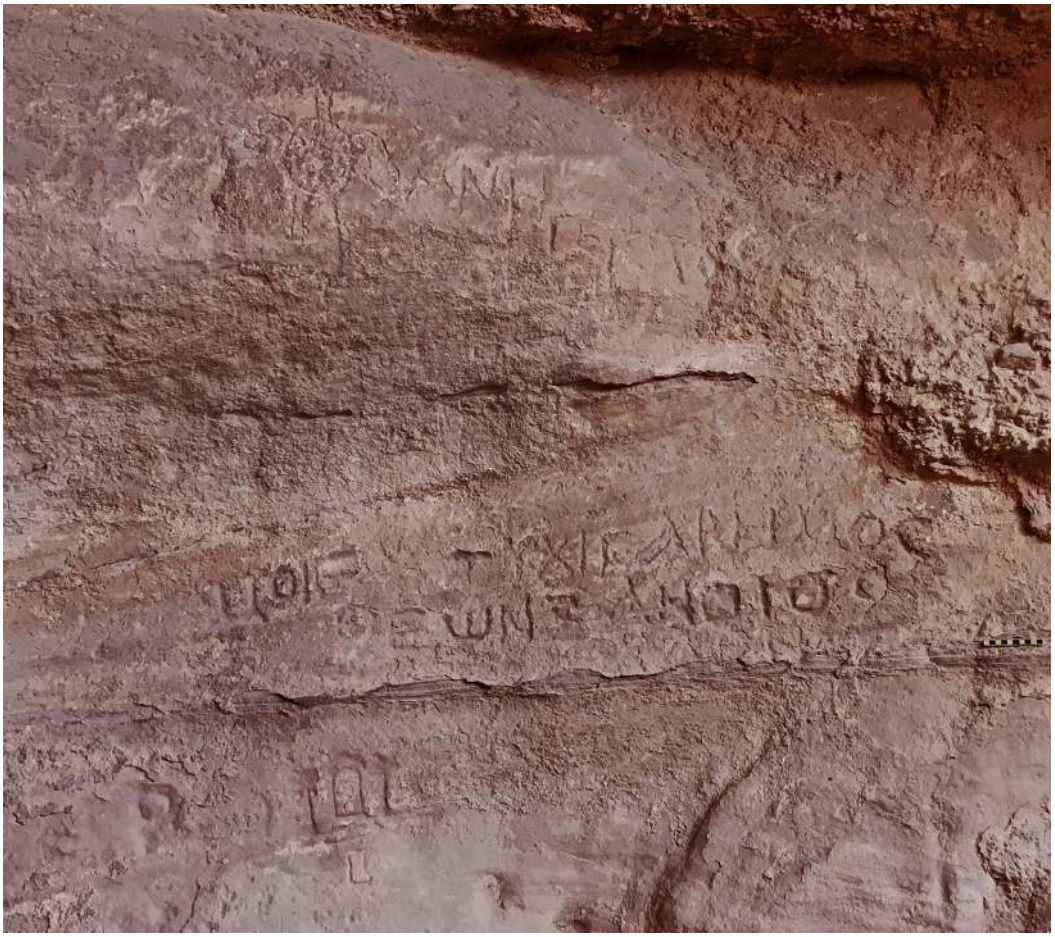


Figure 4. Greek-Nabataean inscriptions and engravings from a cave in Timna Valley.

Figure 5. Another Greek-Nabataean inscription and engravings from Timna.

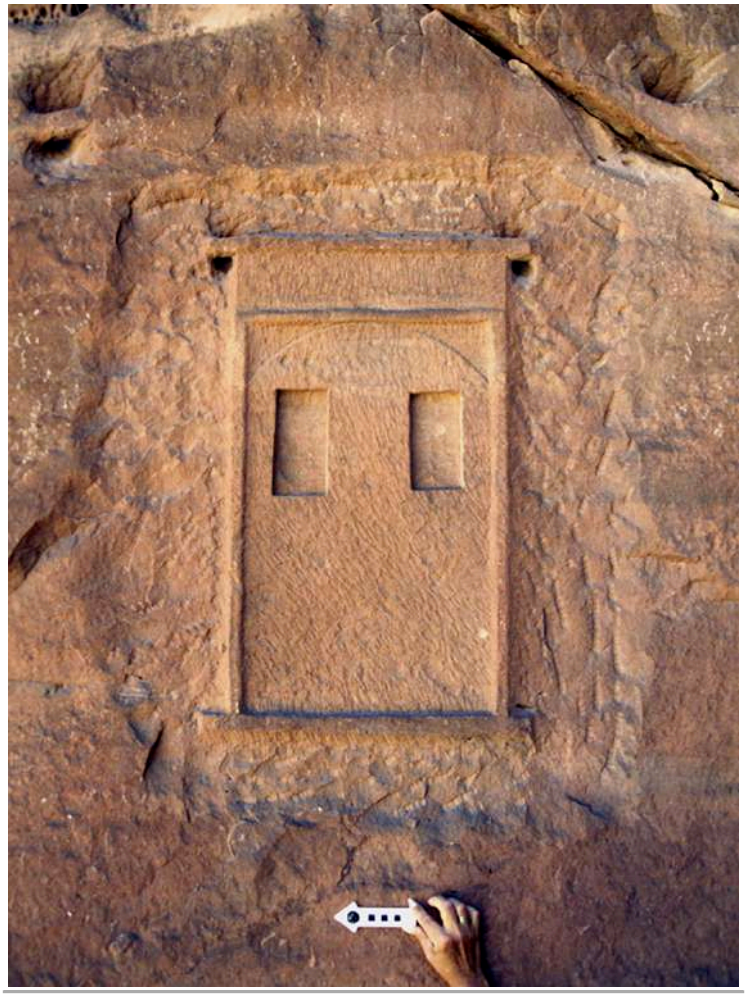


Figure 6. Naḥal ‘Amram, rock stele with an “eye idol”, notice the two pairs of loops cut into the rock, probably for hanging fabrics.

Figure 7. Naḥal ‘Amram, Mine 35/29, Nabataean oil lamp and fragments, produced in Petra in the 3rd-4th centuries AD.

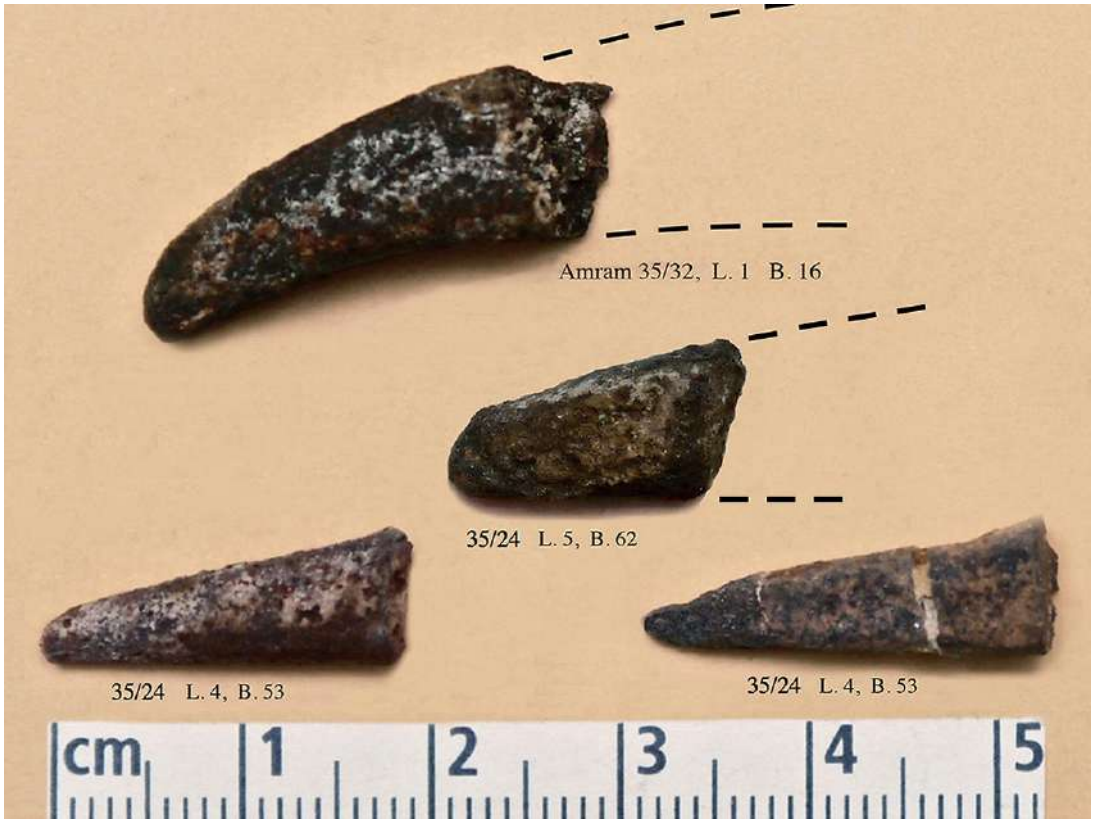


Figure 8. Naḥal ʻAmram, broken tips of small still digging picks, one from Mine 35/32, three from Dwelling Cave 35/24.

Figure 9. Naḥal ʻAmram, entrance to Mine 36/3, with digging marks of small picks and niches for oil lamps (indicating night work).

Figure 10. Dafit fortress, a vertical view. White lines indicate the remains of a rampart, dotted lines show restored rampart.

Figure 11. Yotvata, an open pool with a channel leading to the cultivated field.

Figure 12. Yotvata, the largest open pool intersected by two (interrupted) lines of *qanat*. One circular heap of each line is seen within the northern side of the pool.

Figure 13. Yotvata, lines of present day vegetation indicate the ancient water channels coming out from open pools and *qanat* systems.

Figure 14. Yotvata, the remains of a Nabataean building, partially excavated by Erickson-Gini (looking from SW).

Figure 15. Yotvata, the caravansary, with damage from the mechanical equipment and the probes excavated by Porath. White dotted lines indicate restored perimeter of the building.

Figure 16. Examples of Nabataean pottery from Porath's excavation in the Yotvata Caravansary.

Figure 17. Yotvata Caravansary, remains of white plaster on a stone wall.

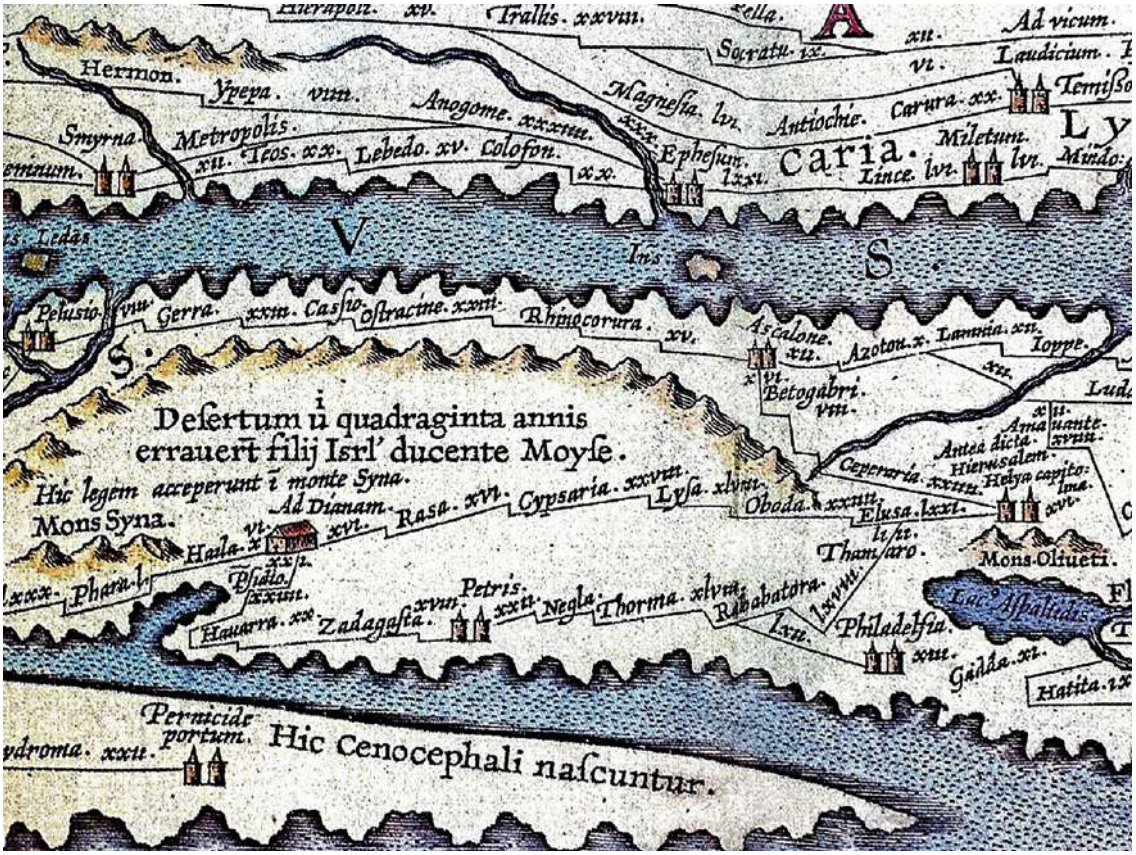


Figure 18. The Peutinger Map, showing, among others, the temple at *Ad-Dianam* - Yotvata (Nebenzahl 1986:22).

Figure 19. Remains of a building in the form of a low mound near the Yotvata spring, the dotted lines show the building's estimated perimeter (ca. 22x22 m).

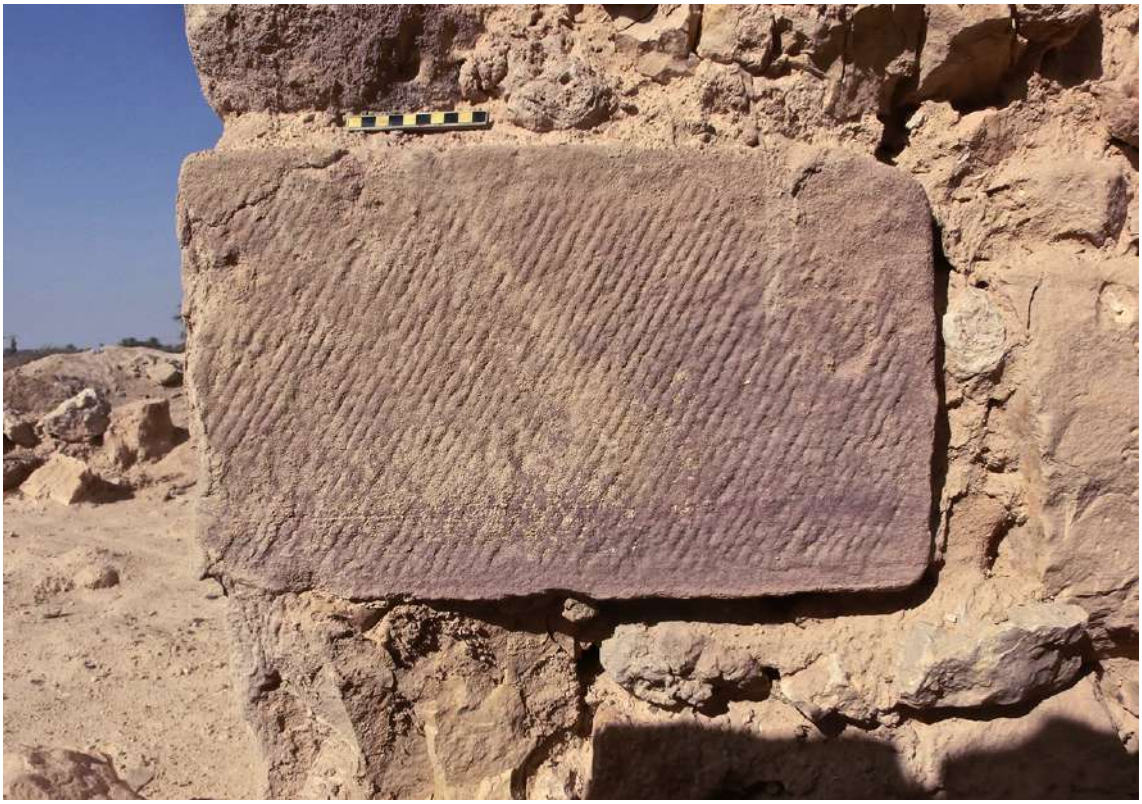


Figure 20. Ashlar stone with Nabataean-style chiseling in a secondary use in the Late Roman fortress of Yotvata, the southern tower.

Figure 21. Mausoleum on a hill above the Yotvata Oasis, a skeleton on the right and an empty cedar-wood coffin on the left (photo courtesy of Z. Meshel).

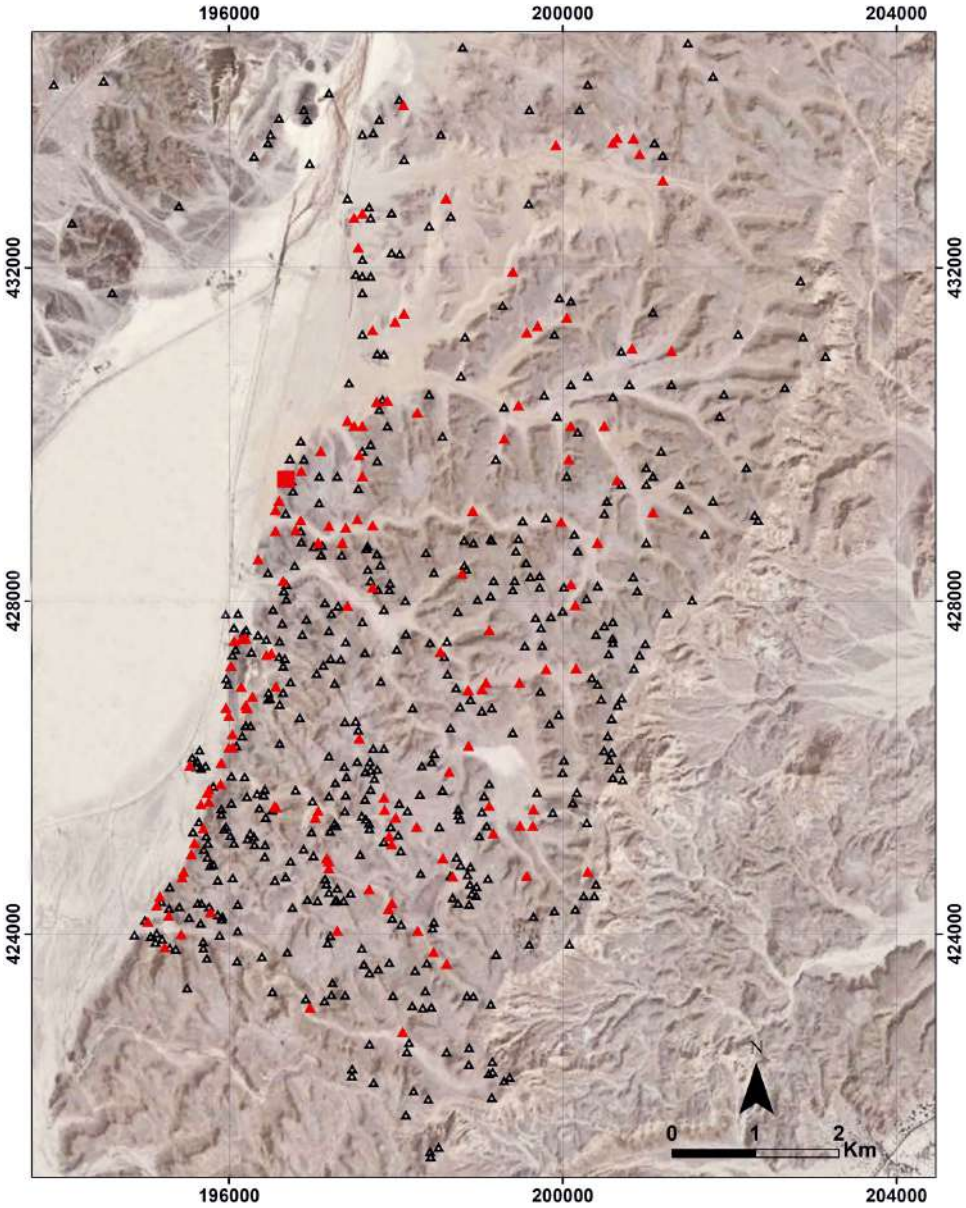


Figure 22. Distribution map of tent camps on the eastern side of ʻUvda Valley (red triangle) and other sites (black triangles), prepared on GIS by R. Shem-tov.

Figure 23. Remains of a tent camp on the eastern side of ʻUvda Valley (Site 100), a row of cleared circles *ca*. 4 m in diameter.

Figure 24. Pottery sherds and a coin of Hadrian from a tent camp on eastern ‘Uvda Valley (Site 96/I).

25. Remains of ‘limans’ on the eastern side of ‘Uvda Valley.

Figure 26. An ancient threshing floor on eastern ‘Uvda Valley, one of a cluster of three (Site 53).

Figure 27. Three types of triads of Nabataean standing stones from ‘Uvda Valley: A. Narrow central stone. B. Three broad stones. C. Central broad stone.

Figure 28. Circular Nabataean structure on the eastern side of ‘Uvda Valley (Site 96/V).

Figure 29. ʻUvda Site 101. A public Nabataean building, excavated by R. Cohen.

Figure 30. ʻUvda Site 101, artifacts from Nabataean building: A. Votive cooking pot, *ungentarium* and oil-lamp. B. Pottery fragment with the face of Tyche (found outside the building).

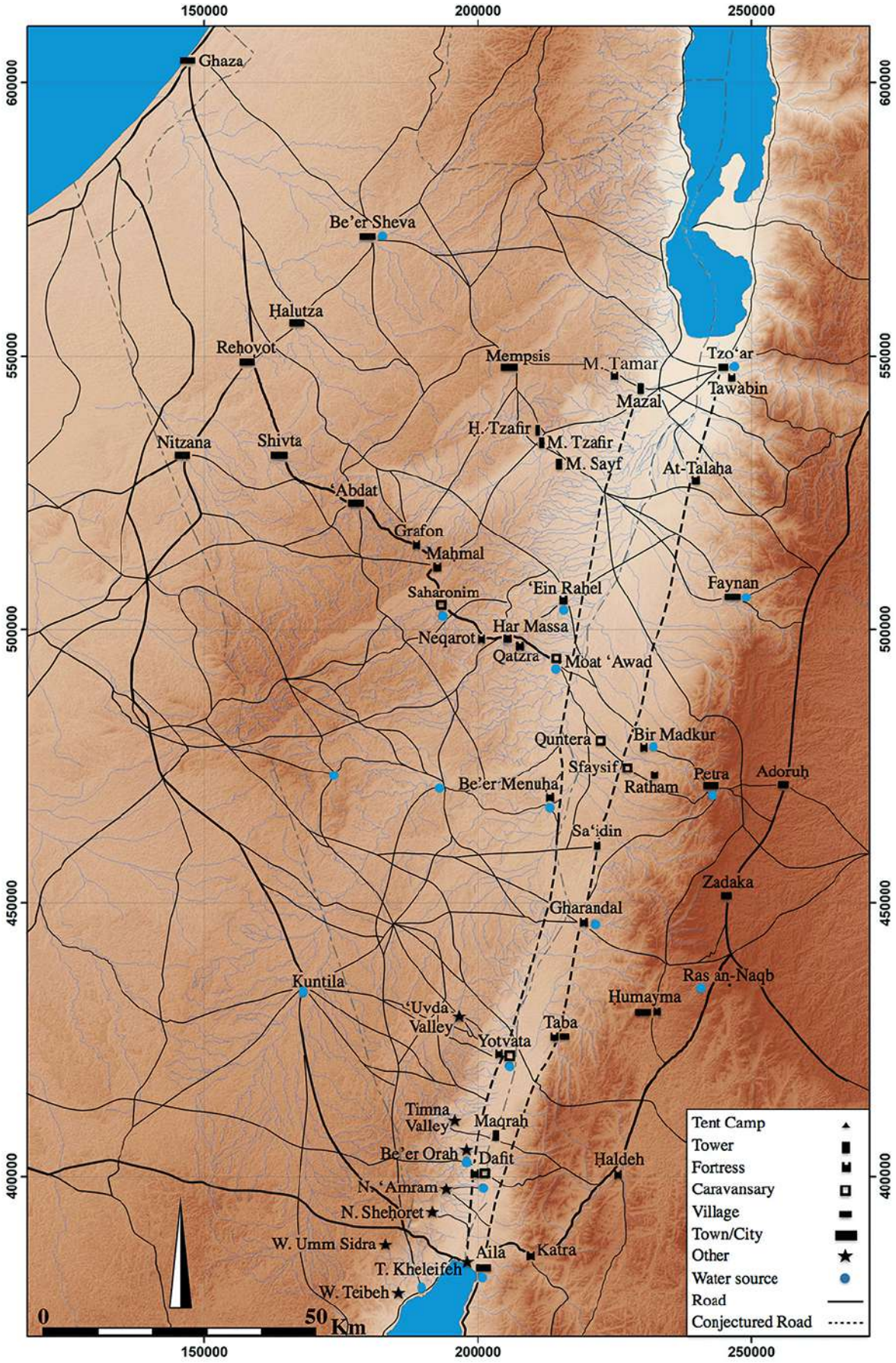
Figure 31. Be'er Orah, the slag piles, view from south.

Figure 32. Be'er Orah, a shrine with a trio of standing slag slabs, with a central broad one and an offering bench (*cf.* Fig. 27c).

Figure 33. Be'er Orah, a cult structure of slag, with a pair of standing slabs on the east and a standing slab on the south.

Figure 34. Be'er Orah, the open church and mosque: A. Vertical view, B. View from west.

Figure 35. Be'er Orah, a small mosque built at the foot of a hillock (excavated by Y. Israel).



36. Map of the main ancient roads in the Negev (see Note 45)

Figure 37. Part of a band of trails of Darb Ghazza in Sinai (total width 150 m), 30 km NW of Eilat, view from south.

Figure 38. Part of a band of trails in the ‘Arabah, north of Yotvata (south of Kibbutz Grofit, total width 200 m), view from south.

Figure 39. Section of the “Incense Road” in the Ramon Crater, the band of trails is only 10-20 m wide.

Figure 40. The top of Ma'aleh Shaharut (Naqb adh-Dhil), connecting the Yotvata Oasis with 'Uvda Valley and Darb Ghazza. Notice the line of cairns ("crenelations") on the left, view from NNE.

Figure 41. Finds collected from bands of trails, from Early Neolithic to near present: A. Naḥal Girzi (NW of 'Uvda Valley). B. The central 'Arabah Valley (SSE of Be'er Menuḥa).

42. Wadi Abu Dheba‘ (SSW of ‘Uvda Valley), a Nabataean military tent camp, view from east.

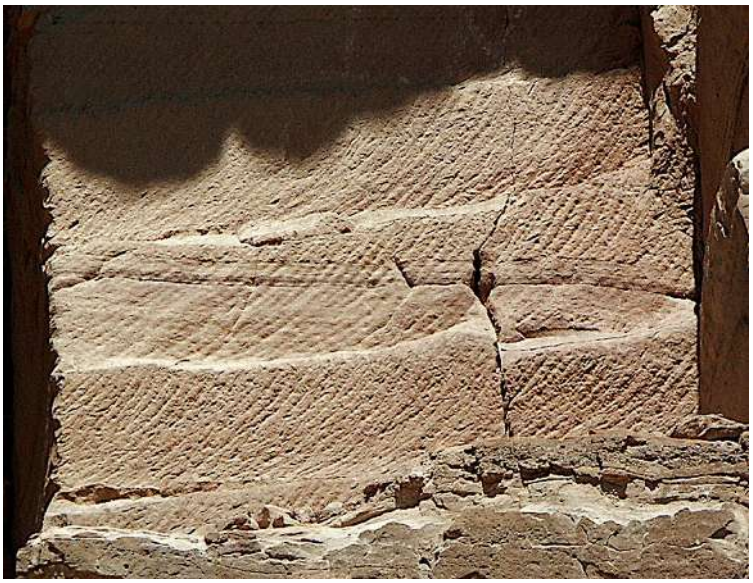


Figure 43. Wadi Tweibeh, in Sinai, SW of Eilat, a section of a broad cliff with Nabataean-style chiseling in a quarry.

Figure 44. Wadi Tweibeh, in Sinai, SW of Eilat, Nabataean rock engravings and inscription- **“שלם וזכיר עליו בר שעדאל”** (“*peace and be remembered ‘Alyu sone of Sa‘adal*”).

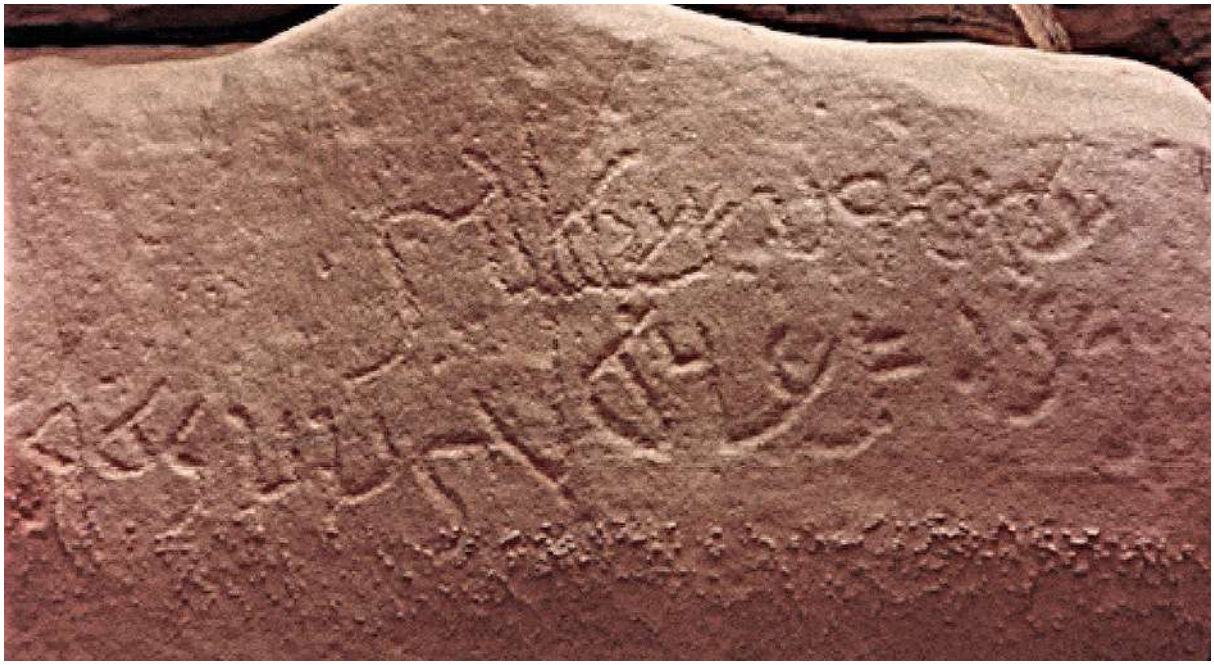


Figure 45. Wadi Umm Sidra, in Sinai, NW of Eilat, Nabataean inscription: The upper- "**עממו בר שעדאלהי**", (*'Ammu son of Sa'adalahi*), the lower- **דכיר שעדאלהי בר בריאו** (*be remembered Sa'adalahi son of Bariu*).

Figure 46. Wadi Umm Sidra, a Nabataean name in Greek- AKPABUE, above a Jewish candelabra, and a Latin inscription on the left.