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ABSTRACT

Elusa – From Nabatean Trading Post to Late Antique Desert Metropolis Results of the 2015–2020 Seasons

Michael Heinzelmann – Christian A. Schöne – Diana Wozniok – Arne Schröder – Florian Jordan – Tali Erickson-Gini – Marlu Kühn – Dafna Langgut – Sina Lehnig

In Roman to late Byzantine times, Elusa (Hebrew: Haluza, Arabic: al-Khalasa) was the most important settlement in the Negev region and its only proper city. Identified in 1838 by E. Robinson, it was subsequently visited by numerous researchers. The most important investigations took place in the form of surveys and excavations from the 1970s until 2001, during which, among other things, the only theatre in the region and the city's cathedral were uncovered. However, despite several research projects, very basic information on the city and its genesis, history and structure has been lacking until now. Since 2015, this has been the focus of an international cooperation project that is investigating these fundamental questions using a multi-method approach. The focus here is also on the role of the city in the region, as it appears as an economic, administrative, cultural and religious centre. Particular emphasis is placed on the city's flourishing in light of its precarious natural location within the Negev Desert. The article reflects the combined findings of remote sensing, archaeological survey, geophysical prospection, targeted excavations, geochemical soil sampling and extensive find material analyses and thus provides an unprecedented insight into the character and development of ancient Elusa.

KEYWORDS

Negev, Nabatean, geophysics, survey, excavation

Elusa – From Nabatean Trading Post to Late Antique Desert Metropolis

Results of the 2015–2020 Seasons

Introduction

¹ During the Roman and Early Byzantine period the city of Elusa (Hebrew: Haluza, Arabic: al-Khalasa) was the most important settlement in the Negev region. It appears to have been founded in the 3rd c. B.C.E. by the Nabateans, as a major stopover on the caravan network known as the ›Incense Road‹ leading from southern Arabia via Petra to the Mediterranean harbour city of Gaza¹. In Elusa, the road intersected with an important north-south link, which ran from Jerusalem to Egypt (Fig. 1). This advantageous location led to the development of the city. With the decline of the long-distance trade in the first half of the 3rd c. C.E., an economic reorientation towards an intensified agrarian use of the desert's margins took place. Although the region only receives an average rainfall of ca. 150 mm, a sophisticated water management enabled the development of one of the most intensive winegrowing areas of the eastern Mediterranean between the 4th and 6th c. C.E.². Although several of the former caravan stations, such as Sobota (*Shivta*), Mamshis (*Mamshit*), Oboda (*Avdat*), Nessana (*Nizzana*) and Ruheibe (*Rehovot*), developed into respectable towns, these sites only reached a proto-urban stage of development³. By contrast, the actual administrative, economic and religious centre and only proper city of the entire region was Elusa, which, according to the most recent epigraphic discovery, held the status of a *polis* from 305/306 C.E. on at the latest⁴. A recently found Severan milestone attests that Elusa functioned as the *caput viae* of the road from *Gaza* to *Petra* and was the base of a military deployment during this period, and not Oboda, as previously assumed⁵. With about 45 hectares of built-up area, Elusa's urban character was underlined by the construction of the only theatre and by the largest public baths of the region, as well as lavishly paved streets partially flanked by porticoes.

¹ For a summary of the older state of research and a general overview of the settlement history of the Negev see: Erickson-Gini 2010, 7–82.

² Among others: Evenari et al. 1971; Bruins 1986; Erickson-Gini 2010: 76. 81 f.

³ Summarizing: Shereshevski 1991, 82–90; Erickson-Gini 2010, 81 f.; for Shivta see also: Segal 1983; Röhl 2010; for Mamshit: Negev 1988a; Negev 1997; Avdat: Negev 1977; Cohen 1980; Nizzana: Colt 1962; Urmann 2004.

⁴ Schöne et al. 2018, 79; Di Segni 2018, 91–95.

⁵ David – Isaac 2020, 5–9.

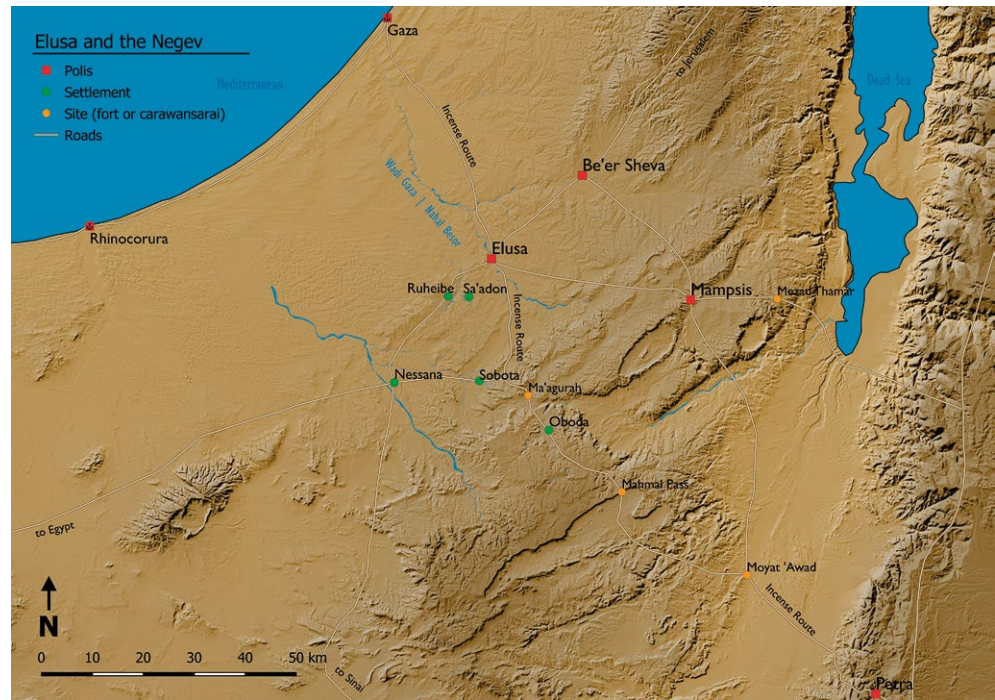


Fig. 1: Elusa (Haluz) and its region in antiquity

1

2 During its heyday in the 4th to 6th c. C.E., Elusa had an estimated 8000 to 10 000 inhabitants. Their names, found in the Nessana papyri and on funerary inscriptions, suggest a population with predominantly Arab/Nabatean roots as late as the 5th/6th c. C.E., but demonstrating a multi-layered cultural identity⁶. While it is disputed whether Elusa functioned as the capital of the province of Palestine Tertia after its establishment in 409 C.E., written sources prove that it had at least central administrative tasks for the Negev region⁷. This role corresponds to the fact that it was the seat of a bishopric and hosted a highly respected school of rhetoric as early as the 4th c. C.E.⁸. Nevertheless, in the second half of the 4th c., ecclesiastical sources still characterised the city as »semi-barbarian«, and its inhabitants as practising »Saracenic cults«⁹. If one believes these sources, extensive Christianisation does not seem to have taken place until the 5th c. C.E. In fact, according to the archaeological evidence, the number of churches seems to have increased sharply during this period. From the later 4th c. onwards, Elusa became also an important station on the increasingly frequented pilgrimage route to the Sinai¹⁰. Against the background of the precarious environmental situation of the city as well as the increasingly difficult political and economic circumstances of the Late Antique/Early Byzantine period, the dynamic development of Elusa during this period can be rated as extraordinary. The city retained an astonishing resilience even in the face of multiple major earthquakes (e. g. in the years 363, 419, 502, 551 C.E.), some of which caused severe damage according to the archaeological record¹¹. It was not until the second half of the 6th c. that the first signs of a crisis became apparent. The Arab conquest found the city already in a gradual process of disintegration and ruralisation.

6 Alt 1921, 26–31; Negev 1983, 217 f.; Kirk – Gignoux 1996, 171–192; Graf 2003, 323–325; Politis 2007, 187–200; Fisher 2011, 138–144; Pini 2019, 7–25.

7 E. g. Dan 1982; Mayerson 1983, 248 f.

8 Keel-Küchler 1982, 151; Mayerson 1983, 248 f.

9 Jerome, *vita Hilarionis* 16.

10 Mayerson 1983, 47.

11 A list of relevant earthquakes at: Amiran et al. 1994, 365 f.; for evidence in the Negev region: Korjenkov – Mazor 2003, 51–82; Korjenkov – Erickson-Gini 2003, 39–50; Korjenkov – Mazor 2005, 1–15. In Elusa, corresponding findings were observed in practically all sondages carried out so far.

The last literary mention of Elusa found in the Nessana Papyri is dated to the 7th c. C.E.¹², while the latest archaeological evidence from our own excavation dates to the 8th c. C.E. After that, there was a 1200-year hiatus in settlement activities until the early 20th c., when a brief attempt at revival was made with the re-foundation of the village of al-Khalasa (Fig. 4)¹³. In the meantime, Elusa was part of the grazing area of various changing Bedouin tribes, the latest of which (since the 19th c.) were the Azazme, who at times also used the site as a burial ground¹⁴. Today, Elusa is a protected National Park site and part of the UNESCO World Heritage Site ›Incense Road‹.

3 The site has been known to scholarship since 1838 and was visited by scholars on various occasions during the 19th and 20th century¹⁵. A first sketch of the site, which is remarkably accurate in its contours, was made by C. Wooley and T. E. Lawrence in 1914/1915¹⁶. First excavations were conducted by T. J. Baly in 1938 in context of the Colt-Expedition, but discontinued after unpromising first trial trenches (Fig. 6)¹⁷. The most important archaeological achievements are attributed to the research activities of A. Negev between 1973 and 1990. He undertook the first general survey and various exploratory excavations, especially in the theatre and the neighbouring ›East church‹, which was identified as possible bishop's church¹⁸. More recent expeditions by the Ben Gurion University resumed the investigation of both monuments and excavated a nearby pottery kiln¹⁹. However, despite these important results, the general topography of the site, the urban structure of the city and its long-term development through the centuries are still not well understood²⁰. Therefore, Elusa can so far be regarded as unexplored in central aspects.

M. H. – C. A. S.

General Topography and Nature of the Evidence

4 Elusa is located at a distance of approx. 45 km from the eastern shore of the Mediterranean. It is situated 225 m above sea level on a flat rock plateau which is formed by the confluence of two wadis, the large Nahal Besor (Wadi Khalasa) on its southern and western side and the smaller Nahal Atadim (Wadi Ausajeh) in the north (Fig. 2. 3). The city extends roughly northwest to southeast over an area of 1000 m × 600 m occupying an irregular shaped area of about 45 hectares. The boundaries correlate with distinctive slopes in every direction, the only exception being the southern hillside towards the Nahal Besor, which is less steep and divided into terraces. To date there is no evidence of the existence of a city wall. A peculiarity of Elusa is that year-round groundwater is available in wells on a level approx. 2–3 m below the wadi bottom. So far, four original wells shafts have been identified in the immediate vicinity of the city,

12 Kraemer 1958, 33.

13 The settlement existed from about 1918 to 1948 (Khalidi 2006, 75 f.). A few dilapidated buildings remain of the village built from ancient spolia to the west of the ancient city. Under the British Mandate, the ruins were placed under protection and plans were made to relocate the settlement to the far bank of the wadi to prevent further on-site settlement (Correspondence of R. W. Hamilton, Director of Antiquities, IAA-Archive http://www.iaa-archives.org.il/search.aspx?loc_id=9550&type_id=> (last accessed 8.4.2021)). The village has been abandoned since 1948.

14 von Oppenheim 1943, 122–128.

15 E. g. Robinson – Smith 1860.

16 Woolley – Lawrence 2003.

17 Baly 1938, 159.

18 Negev 1974; Negev 1976; Negev 1981; Negev 1993a; Negev 1993b.

19 Goldfus et al. 2000; Goldfus – Fabian 2000; Fabian – Goren 2002, 150 f.; Arubas – Goldfus 2008; Bucking – Goldfus 2012.

20 Shereshevski 1991, 84–90 published a more detailed map of the city (plan 6) based on the interpretation of aerial photos. However, comparison with our own results of a magnetometer survey showed that it is highly unreliable.



2



3

Fig. 2: Elusa (Haluz). Drone image with overview of the city area, looking N

Fig. 3: Elusa (Haluz). Drone image looking E during a wadi flood in spring 2019

two of which still carry water. Another unusual feature of the place are huge waste mounds consisting of alternating layers of urban household waste (incl. hearth ashes), sand and construction debris that surround the city all along its outer perimeter covering a surface of about 14 hectares and reaching in some places a height of up to 12 m (see Fig. 5. 6). They appear to have been utilized between the 4th to mid-6th c. C.E. during the peak of the development of the city and they are remarkable evidence of elaborate communal waste management²¹. The waste mounds leave larger open spaces at the entry point of arterial roads. In the immediate north, west and south of the city on both sides of the Nahal Besor there were

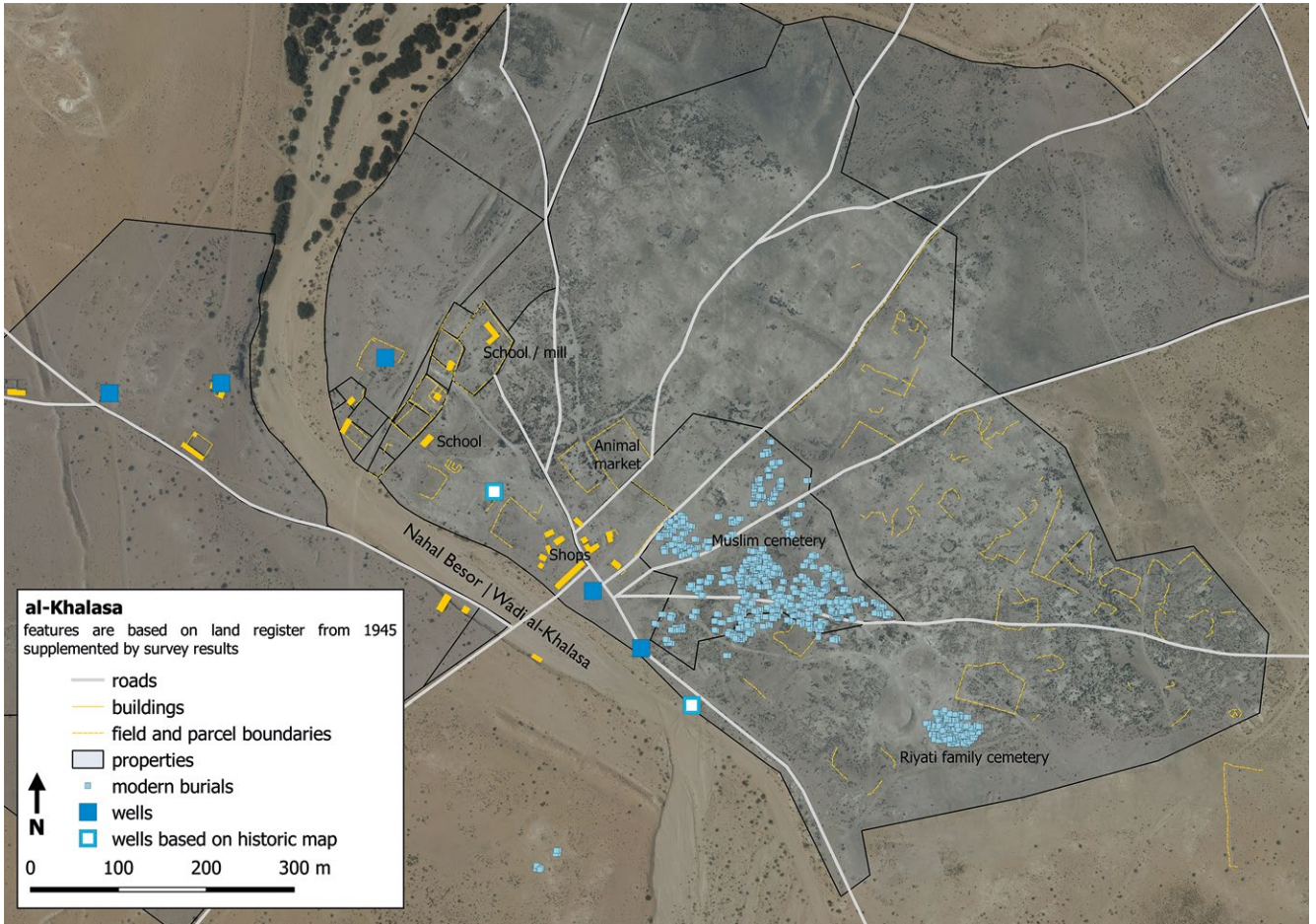
extensive loess areas, which apparently were used for horticulture and were protected and bordered by low stone walls. In another approx. 600 to 800 m wide ring, the city was surrounded on all sides by densely occupied cemeteries. Covering a surface of at least 117 hectares, these consist of many thousands of mostly undisturbed inhumations (of which 5490 burials have been individually recorded so far) plus the remains of about 20 funerary monuments²². Outside of this ring of cemeteries, numerous archaeological structures such as farm buildings and villages, terrace walls, field boundaries, wine presses, cisterns and wells are still visible in the landscape in a distance of up to 5 km and beyond, testifying to the intensive agricultural use of the city's micro region²³.

5 In an early phase (until the 2nd c. C.E.), some of the city's buildings were still constructed of mud bricks on stone foundations, but then a complete transition to solid stone construction took place. As a rule, these structures consisted of a well-joined, dou-

21 Bar-Oz et al. 2019, 8244 f.

22 On the cemeteries see: Heinzelmann et al. 2017, 118–123; Schöne et al. 2018, 83–86.

23 Schöne et al. 2018, 86–89; Heinzelmann et al. 2019/2020, 141–160.



4



5



6

ble-shell masonry of *opus quadratum* with occasional very large stones. Two local types of limestone can be distinguished; a harder one appears mainly in the earlier buildings (2nd–5th c.) and a soft one mainly in later buildings and repairs (5th–7th c.). While the quarries of the first group have not yet been located, those of the soft limestone are found in various wadis less than 1 km from the urban area. Typical for the region, the floors and the roofing of houses were done with large stone slabs over arches. Vaults or *opus caementicium* are only found in larger public buildings (churches, baths). Roof tiles have so far only been found in the context of churches and building bricks in the furnaces of baths and kilns. Many buildings show destruction patterns that are probably due to earthquakes, however, these were repaired a short time later, maintaining the ground plans. In the late phase, there are also successive reinforcements of

Fig. 4: Al-Khalasa. Overview over the modern settlement which existed in the first half of the 20th century. Features based on survey and historical maps

Fig. 5: Elusa (Haluz). View from NW, in the foreground the Nahal Atadim, in the background one of the big waste mounds

Fig. 6: Detail of the same waste mound (cf. Fig. 5). The depression is one of the trenches conducted by the Colt Expedition in 1938



7

Fig. 7: Elusa (Haluzá). Present condition of the surface in spring. Most of the original debris was transported to Gaza and Beersheva as building material at the turn of the 19th and 20th centuries, but the undulating surface still reveals the remains of buildings and streets underneath

the buildings by the addition of revetment walls to the exteriors. The occupational horizons inside the buildings, but especially in the streets, rose considerably over time and can sometimes form a high stratigraphy of up to 3 m. In the last phase (7th/8th c.), a gradual dismantling of the architectural fabric took place, starting with some public buildings such as churches and baths, which were often completely stripped of their marble decoration. After the final abandonment of the site, all buildings gradually collapsed. The accumulating rubble filled their interiors, stabilising the lower sections of the walls that were still standing and forming towering mounds of debris. Over the centuries, the deposition of drifting sand led to the formation of a closed sand cover, from which only the upper parts of the rubble mounds protruded; a situation that is still visible at sites like Rehovot or Sa'adon. In contrast

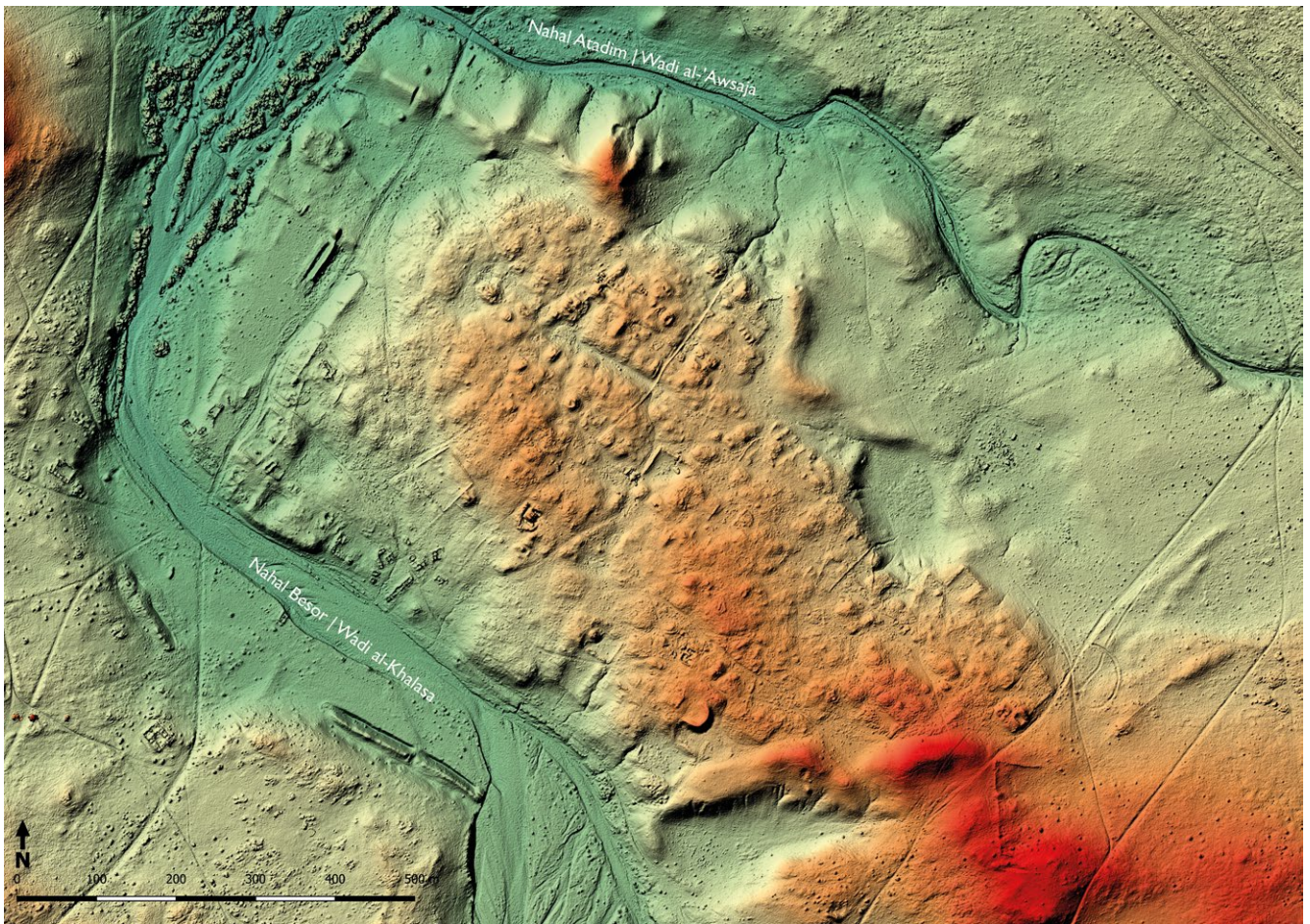
to these sites, a systematic looting of building stone took place at Elusa from the mid 19th c. until 1918, in which most building materials visible above the sand were removed for the construction of Ottoman Gaza and Beersheva²⁴. Fortunately, the majority of the ancient building stocks below the sand were left untouched. As a result, today the site has a smooth undulating surface mostly covered by sand, with pronounced hills above collapsed buildings and distinct depressions in streets and open spaces (cf. Fig. 7. 8). Paradoxically, the stone looting resulted in an almost ideal situation for archaeological research, because, on the one hand, the cleared surface is very suitable to the use of non-invasive investigation methods and, on the other hand, the access for excavation was facilitated. At the same time, a considerable amount of archaeological substance remained intact, with walls preserved up to a height of 5 m and a largely undisturbed stratigraphy as the result of a 1100-year settlement history.

M. H. – C. A. S.

Objectives and Methodology

6 The main objective of the project is to obtain as complete an image as possible of the ancient city of Elusa with respect to its settlement history, its cultural character, its economic structure and its ecological environment. The first challenge is to gain a detailed insight into its urban structure as well as its long-term development and to understand the relevant process factors. A further aspect is whether and in what manner the city's location and function at the interface between the rural communities of the Negev region with its Nabataean-Arab traditions on the one hand, and the Hellenistic-Roman world of the Mediterranean on the other, are reflected in the settlement pattern, architectural fabric and finds of the city. Regarding its economic structure, it is important to examine Elusa's role as a central place with a market and service function for the Negev region, as well as the resources, production and agricultural exploitation of the immediate hinterland of the city. Closely linked to this are questions about the ecological parameters (e. g. climate, availability of soil and water). Above all, there is the issue of how a city of this size was able to prosper over several centuries on the fringe of a desert.

7 In order to address these diverse questions, the investigation is divided into two sub-projects, each of which uses different methodological approaches: one sub-pro-



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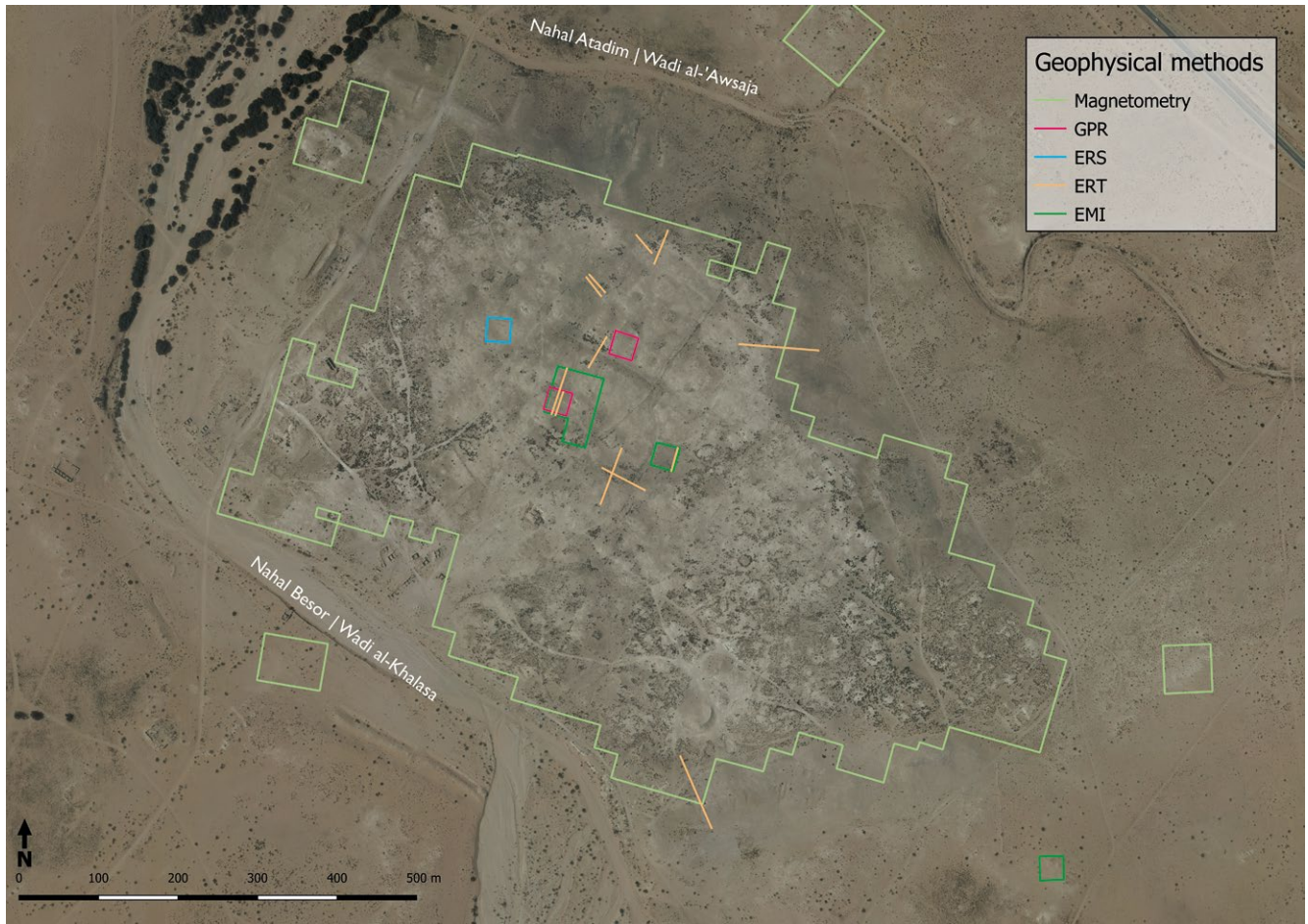
ject, working since 2015, deals with the investigation of the actual city area, while a second one, begun in 2018, is dedicated to the surrounding hinterland of Elusa²⁵. This article will concentrate on the results achieved within the city area so far. The project design developed to investigate the city itself requires a multi-disciplinary approach involving remote sensing, large-scale geophysical prospections, different survey strategies, targeted stratigraphic excavations and comprehensive material analyses.

Remote Sensing

8 As part of the project, satellite and aerial images are collected, georeferenced and embedded in a GIS (QGIS 3.22.0) and then systematically analysed. However, the resolution of the available imagery is usually too low to gain more detailed insights into the urban structure. Therefore, a high-resolution orthophoto (2 cm per pixel) was created, based on a large-scale drone survey, which by now covers an area of 17.5 km². It has proven mostly impossible under the local desert conditions to apply the usual methods of aerial archaeology, which mainly use vegetation features. Instead, the high-resolution orthophoto has been demonstrated to be a successful manner to identify building structures visible above ground. Equally helpful is a high-resolution elevation model derived from it (Fig. 8), which enables, for example, the recording of streets and courtyards (as depressions) or the estimation of preserved building heights (under hills). In the future, a newly acquired infrared drone will be used to test whether thermal differences can be used to detect building structures.

Fig. 8: Elusa (Haluzá). Digital elevation model based on drone images and Structure from Motion

25 Previous reports: Heinzelmänn – Erickson-Gini 2015; Pickartz et al. 2015; Heinzelmänn et al. 2017; Schöne et al. 2018; Di Segni 2018; Heinzelmänn et al. 2019/2020.



9

Fig. 9: Elusa (Haluza). Aerial image with indications of the geophysical investigations carried out between 2015 and 2018

Fig. 10: Various geophysical methods in use, a: Electrical resistivity tomography; b: Electromagnetic induction; c: Caesium magnetometer; d: Ground penetrating radar



a



b

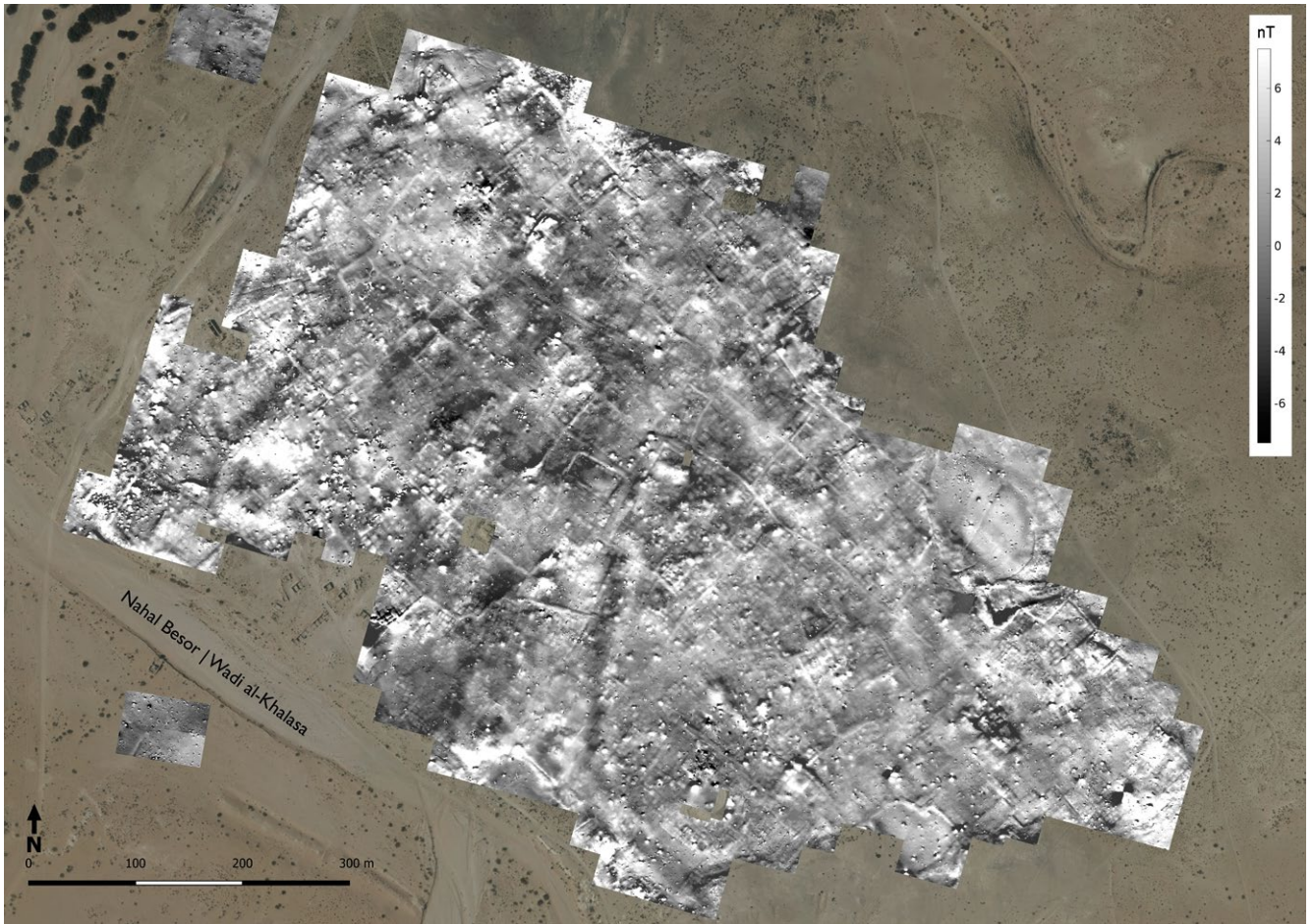


c



d

10



11

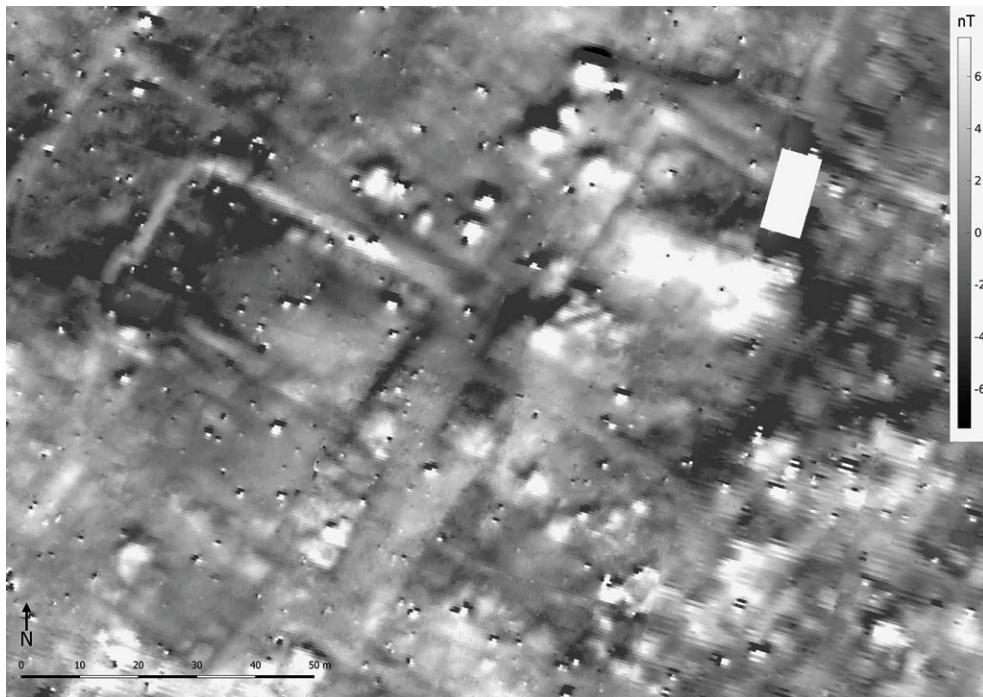


Fig. 11: Elusa (Haluzá). Magnetic map of the city based on the investigations (2015–2018)

Fig. 12: Elusa (Haluzá). Detail of the magnetic map

12

Geophysical Prospection

9 Several different geophysical methods were applied in Elusa in order to test their potential (Fig. 9. 10). These include ground-penetrating radar, electrical resistivity

tomography, electromagnetic induction, electrical resistivity and magnetometry²⁶. All of these methods provided different information, some of which complemented each other. However, magnetometry proved to be the most suitable and efficient method under local conditions and was used from 2015 onwards to map the whole inner city. By 2018, the whole surface of the city (45 hectares) had been surveyed by a four-sensor Caesium-magnetometer (Geometrics G-858; Fig. 11). Its results reveal many urban features, including the road network and numerous buildings, some of which are so detailed that individual rooms can be identified (Fig. 12). In order to close existing gaps and to be able to record individual building structures in more detail, targeted measurements of individual areas are to be carried out in the future using other geophysical methods.

M. H. – C. A. S.

Archaeological Survey

¹⁰ During four seasons between 2015 and 2018, the entire urban area was subjected to an archaeological field survey (Fig. 13). Using the 30 m × 30 m grid of the magnetometer survey, the surface was systematically walked by a permanent team of 3 persons in regular lines of 3 m distance. All finds were recorded with an accuracy of <1 cm by using a RTK-GPS/GNSS (Trimble R8s) with automatic data correction via the Israeli GPS-GSM Network. Since the survey took place within a densely inhabited urban area with an extremely high amount of pottery on the surface, a systematic recording of this find category would have exceeded all capacities²⁷. Instead, the survey focused on the registration of visible building structures (about 600 walls) and architectural fragments (e. g. capitals, column drums, door jambs and lintels) as well as such find categories that would allow conclusions on the functions of the buildings lying below the surface. These include marble fragments, mosaic and glass tesserae and roof tiles (all used nearly exclusively for churches in the Negev), bricks and wall tiles (usually related to kilns or the fireplaces and hypocausts of baths in the Negev settlements) and grinding stones, scoria and wasters (as indicators of various economic activities). A total of 5069 such indicator objects have been recorded. In this context, two major factors biasing the result should be noted. The first is that the eastern part (about a third) of the city is covered by a denser sand layer and vegetation, which is why the visibility of smaller artefacts is reduced in comparison to the western areas. The second is that – especially in the western part of the urban area – there are punctual interventions due to modern activities (which have also been systematically recorded), such as 520 Bedouin tombs (probably 19th to early 20th c.), as well as houses and field boundary walls related to the modern settlement of al-Khalasa (ca. 1918–1948). Since these structures made use of ancient building materials, they have resulted in at least small-scale displacement.

M. H. – D. W.

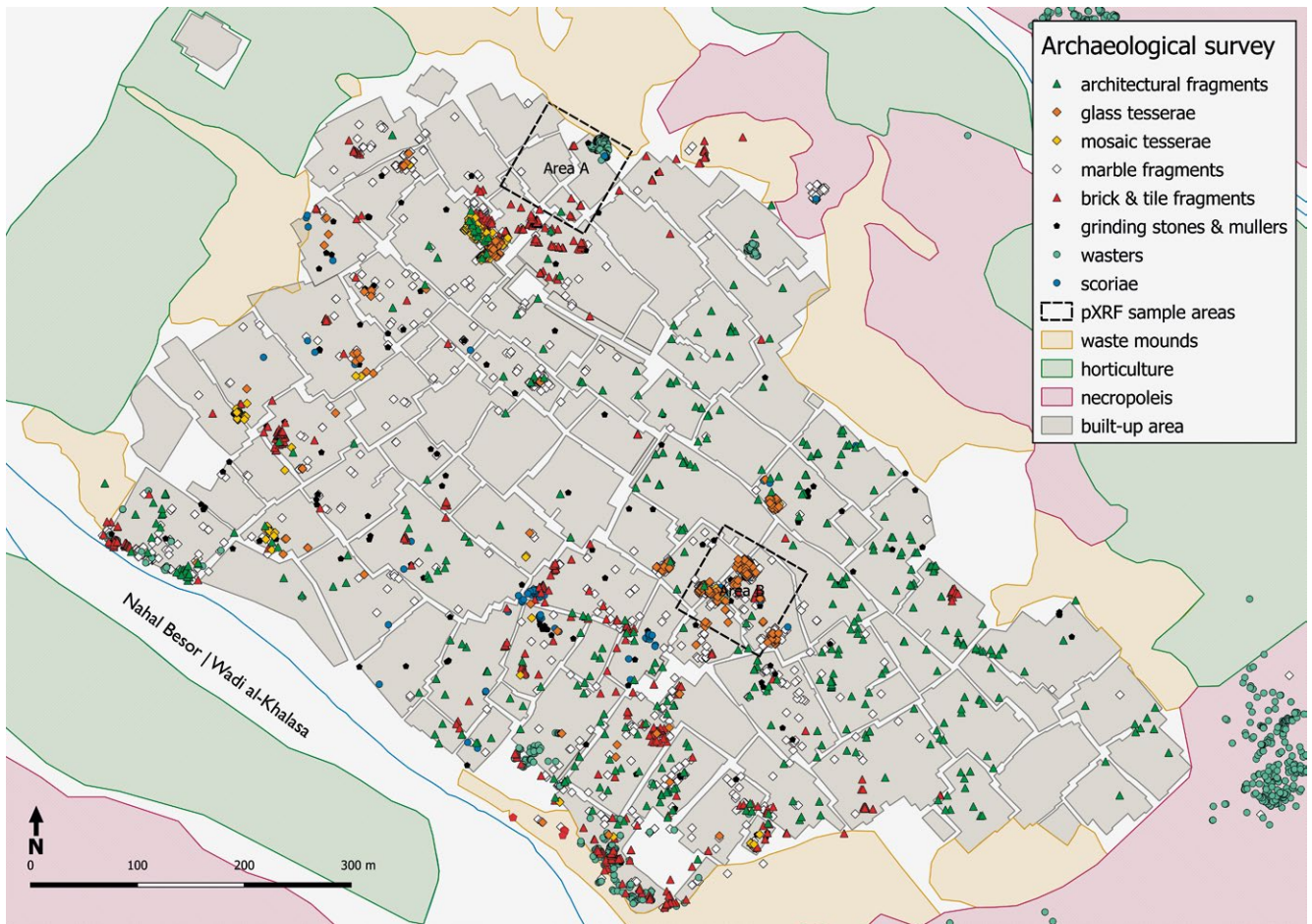
Geochemical Soil Analysis

¹¹ Based on the archaeological survey of the city, it was possible to acquire much information on the economic activities inside the city, such as pottery workshops, metal processing and glass production. The chemical soil composition can contribute to the localisation of such activities²⁸. For example, concentrations of lead and mercury may indicate metal processing, while phosphorus is commonly related to organic decomposi-

²⁶ For further information: Pickartz et al. 2015.

²⁷ A systematic collection of surface pottery only took place on a few test plots, which were later excavated in order to enable later comparisons.

²⁸ For the successful application of this method to other sites, see for example: Cannell 2016; Dallai et al. 2020.



tion and may relate to disposal of organic wastes or animal husbandry. To test this approach two 90 m × 90 m squares were chosen and 100 samples taken in a grid of 10 m × 10 m (Fig. 13). To exclude modern organics (e. g. roots) and the most recent surface influences, 10 cm of topsoil were removed before taking the samples. The samples were processed in a unified procedure (drying, sieving, compression) before being measured (three times 6 min. each) with a portable XRF device (Niton XL3t with Analyticon) under constant laboratory conditions. The preliminary evaluation of the results is very promising: the data obtained demonstrate clear concentrations of significant elements in different sites (Fig. 14). After a more in-depth analysis of the data, we plan to extend this approach to larger zones of the urban area.

M. H. – A. S.

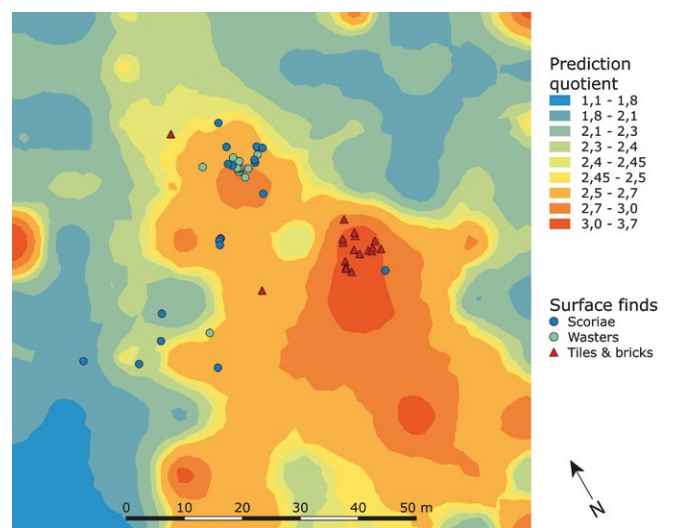
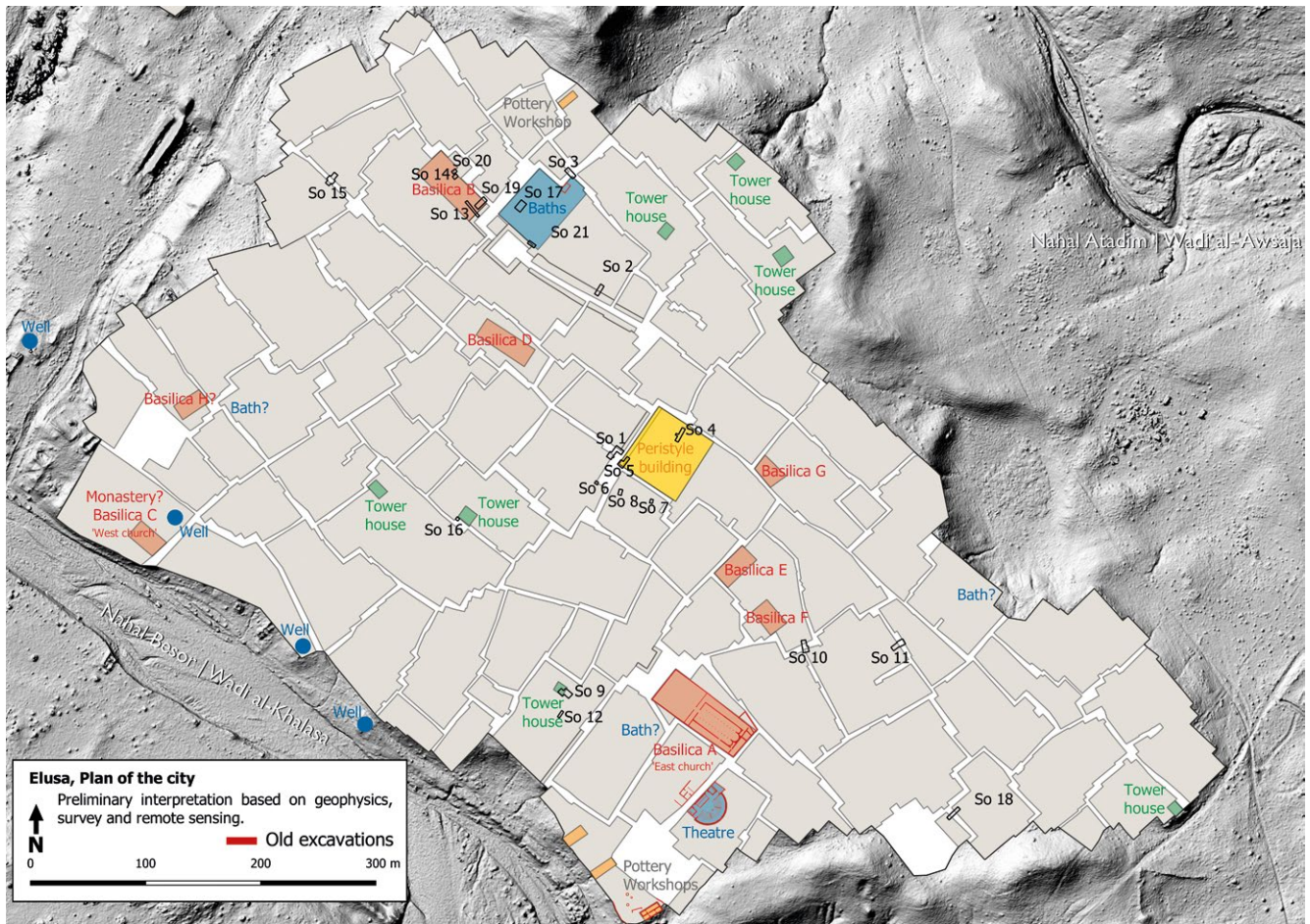


Fig. 13: Elusa (Haluzá). GIS-based map with selected results of the urban survey (2015–2018)

Fig. 14: Elusa (Haluzá). pXRF, Area B. Prediction map based on universal kringing of Al_2O_3 , Fe_2O_3 , MnO and Rb in comparison to selected survey finds. The element combination was identified by PCA

Stratigraphic Excavations

12 In order to verify the results of the geophysical prospections, but above all to obtain additional information on the chronology, a total of 21 stratigraphic sondages were carried out since 2015 (Fig. 15). These were situated at points of varying urban relevance, in particular streets (Sondages 1–3, 10, 11, 15, 18) and specific buildings (4–9, 12–14, 16, 17, 19–21). Whenever possible, they were excavated down to the virgin soil to achieve a complete stratigraphy from the earliest phase of use to the abandonment



15

Fig. 15: Elusa (Haluzá). Preliminary city plan. The interpretation is based on geophysics, survey and remote sensing

of the site (Fig. 16). For reasons of time, but also to reduce the destruction caused by the archaeological interventions, the surfaces of the trenches were kept as small as possible, on average approx. 4 m × 6 m. Since the excavation trenches could run to depths of up to 5 m, it was necessary to support the walls of the trenches for safety reasons. Because of this, the excavation area of the deeper trenches was continuously reduced, with the result that the density of information and finds for the late phases is greater than for the earlier periods. The excavations are carried out according to stratigraphic principles and the concept of ›Stratigraphic units‹²⁹. A special aspect of the site is that there are many different types of sand deposits, which are not always easily distinguishable. The documentation on site is largely analogous followed by a daily input into the modular database system of the German Archaeological Institute (iDAI.field). Drawings are all done on site and manually, usually based on data from tachymetric survey or ›Structure from Motion‹. Stratigraphically important layers are systematically sieved. Additionally, to obtain archaeobotanical material, selected layers were floated. For conservation reasons, all trenches were completely backfilled at the end of each season.

Finds Processing and Chronology

¹³ The examination of the various find materials is being carried out by specialists and laboratories in Israel, Germany and Switzerland and is currently at different stages of processing. As for the dating, the majority of the chronological evidence is based on the ceramic evidence (see below). However, it should be noted that for the Negev region many of the relevant pottery types only give relatively broad timespans,

while there are still no reliable chronotypologies for the majority of locally produced wares³⁰. Unfortunately, the local preservation conditions for coins are rather unfavourable. In total, 367 coins were found, of which 223 have been numismatically examined so far, but the proportion of legible coins is less than 30 % (62)³¹. Of these, the vast majority date from the late phases, especially the 4th–6th centuries. To compensate for these dating difficulties, a total of 78 ¹⁴C samples from important contexts have been radiocarbon dated so far in the AMS laboratory of the University of Cologne. A series of OSL samples from early sand layers is still in the process of analysis. The project uses a regional chronology system based primarily on ceramic dating in the Negev with the following epoch divisions³²:

Hellenistic: 334–30 B.C.E.

Early Roman: 30 B.C.E. – 106/early 2nd c. C.E.

Mid Roman: 106/early 2nd c. C.E. – 250 C.E.

Late Roman: 250–300/350 C.E.

Early Byzantine: 300/350–450 C.E.

Mid-Byzantine: 450–550 C.E.

Late Byzantine: 550–637 C.E.

Early Islamic: 637– 8th c. C.E.

M. H. – C. A. S.

Results of the Geophysical Prospections and the Archaeological Survey: Towards a New City Plan

¹⁴ The main sources of information for the reconstruction of the city plan of Elusa (Fig. 15) are the results of the magnetometer prospection and the approximately 600 individual walls recorded during the archaeological survey. The roughly 1000 m × 600 m large urban area was completely built-up. The settlement has a strikingly closed outer contour, so that the question of the existence of a city wall must be addressed, especially since some of the Negev settlements such as Mampsis and Oboda did have such fortifications³³. However, neither magnetometry nor several ERT transects revealed evidence of such a structure. A further argument against a city wall is the fact that in some areas, the outer boundary of the buildings jumps abruptly back and forth, which does not make sense from a fortification point of view. The survey showed that, especially in the northeast, several outer walls of houses actually form the perimeter of the city. It therefore seems that the appearance of the city was very similar to that of Shivta, whose outer contours were formed by tightly closed, windowless house walls, which only left a few access points for arterial roads, but without having lockable gates. This almost unbroken line of outside walls probably is not meant as a fortification and has no military use, but is rather to be understood as a protection of the interior of the city against the regularly occurring sandstorms.

¹⁵ Inside the city, the road network apparently does not follow a systematic planning in the sense of an orthogonal system, but is instead characterized by a few long road axes that traverse the entire city more or less in parallel, as well as many smaller side streets. The total length of the road network can be calculated to be approximately 11.3 km with an average width of 4.3 m. The streets intersect at irregular intervals,

³⁰ For a summary see Erickson-Gini 2010, 101–304.

³¹ The numismatic examination was carried out by the coin department of the IAA under the supervision of D. T. Ariel.

³² For an overview of the general development of the Negev region and the archaeological evidence see Erickson-Gini 2010, 35–82.

³³ Shereshevski 1991, 20 f.

which results in more or less rectangular *insulae* of varying sizes. While this appears fairly regular, all the streets of the city have sudden changes in direction and width. Furthermore, some side roads end as a cul-de-sac within a neighbourhood – a phenomenon known from smaller towns in the Negev, such as Shivta, which can be interpreted as an indicator of a clan-based social structure in which large families inhabit entire quarters with limited access to outsiders³⁴. The major streets in Elusa were also partially lined with porticoes, sections of which were retrieved in Sondages 2, 3, 5, 13 and 21. They have a width of approx. 4–5 m and consist of columns with elaborately decorated bases, both made of local limestone. The erection of all the excavated porticoes dates to the mid-5th c. C.E., as does the paving of the entire street network with large stone slabs (see below). However, all porticoes seem to be associated with individual buildings and do not appear to be the result of an overarching communal intervention. One could perhaps state that there is one possible exception to this, an east-west running street axis which takes its western starting point at the large bath complex and seems to have been developed as a colonnaded street over a length of approx. 130 m up to the crossing with another main road of the city adjacent to the nearby large peristyle building. It was evidently a prominent street in the centre of city. In fact, at both ends, it widens into small squares (western: ca. 32 m × 30 m, eastern: ca. 20 m × 25 m), the western of which is also enclosed by porticoes on all sides. Although this is too small to be addressed as a forum/agera it nevertheless seems to have been used for the erection of statues, as attested by the discovery of a corresponding pedestal inscription in Sondage 21 (see below). Interestingly, apart from these small square-like street extensions and a slightly larger forecourt in front of the ›East church‹, there seems to have been no regular public space in the sense of an agora or forum. Instead, some intentionally created open spaces seem to have existed on the outskirts of the city at the beginning of arterial roads, where they are usually formed by a gap or recess in the dump mounds surrounding the city, creating a free space (see Fig. 15). These may have been linked to trade or market activities, such as the loading and unloading of caravans, or the stocking and exchange of local goods and livestock. While the open spaces to the north and east seem to have been largely free of architecture, the one on the southeastern edge, located directly below the theatre, according to the geophysical results was enclosed with porticoes. As the particularly important long-distance route along the Nahal Besor into the interior of the Negev Highlands seems to begin at its southeast corner, this may be the reason for the design of this square as a kind of monumentalized entrance area to the city.

¹⁶ In terms of furnishing the city with public buildings, two major chronological horizons can be identified so far. As early as probably the 2nd or early 3rd c. C.E., the theatre was built in a remarkably peripheral location at the extreme southeastern corner of the city³⁵. The excavations of A. Negev confirm that the building was a typical Roman theatre type with a freestanding *cavea*. But it is rather surprising that the theatre is oriented with its stage building towards the city in such a way that the *cavea* was built over the hillside, which strongly slopes at this point. This made it necessary to build much more elaborate substructures. However, the exterior of the auditorium may thus have created a façade effect that was visible from afar, facing the two main arterial roads arriving from the southeast and southwest. Although the building has only very modest dimensions (37 m × 27 m) and could accommodate an audience of about 1250 people at most, it is the only one of its kind in the entire Negev region. A second important building of this period is a large bath complex at the western end of

³⁴ See among others: Wirth 2000, 342–376; Röhl 2010, 159–161; Pini 2019, 34 f.

³⁵ Negev 1993a, 380 dated the building to the 1st c. C.E. without conclusive reasons. Arubas – Goldfus 2008, 1714 corrected this date to »not earlier than the 2nd century AD« on the basis of their excavations. Basically, a construction in the post-Severan period seems unlikely, which is why a construction date in the 2nd or early 3rd c. C.E. seems most plausible.

the above-mentioned colonnaded street. With a surface of 53 m × 46 m, numerous luxuriously equipped bathing rooms, a peristyle courtyard and extensive service areas, it is by far the largest purely urban Roman bath in southern Palestine. Both the theatre and the baths remained in use (with multiple renovations) until the 5th/6th c. C.E. Although the existence of temples can be assumed according to the early Christian sources, no other public buildings of this phase can be identified with certainty at this point in the research.

17 A second phase of public building activities seems to be detectable from the 4th century onwards, beginning with a large peristyle building of 60 m × 60 m, located at a central crossroads in the centre of the city. It is probably a market building that was practically rebuilt on the same ground plan after a severe destruction by an earthquake in the mid-5th c. C.E. New church buildings seem to have been constructed in many other places around the city during this period. A. Negev already suspected the existence of two church buildings (the so-called East and West church), of which he was able to excavate the eastern one in the immediate vicinity of the theatre. It is a 40 m × 18 m three-aisled basilica with an atrium in the west, which was subsequently addressed as an episcopal church due to its size and monumental marble decoration³⁶. The results of the archaeological survey show concentrations of the above-mentioned diagnostic find categories (roof tiles, marble fragments, floor and vault tesserae) and thus allow the confirmation of Negev's West church as well as the identification of six additional churches. The former seems to have been integrated into a larger complex which also includes an atrium and subsidiary buildings, possibly a monastery. While this compound is located at the very southwestern edge of the city, similar to the well-known monasteries in Shivta (North Church) and Rehovot (Northern Church)³⁷, the other churches are distributed relatively evenly over the western and central parts of the city, but not in the East. However, this observation could be biased due to the denser sand cover in the eastern area (see above), so that the original number of churches may have been even higher. One of these new churches (Basilica B) in the immediate vicinity of the large bath complex has been excavated in several sondages and could be positively identified as a church (see below). It was another three-nave basilica with atrium (41 m × 21 m)³⁸, which was barely inferior to the East church in terms of size and decoration.

18 The archaeological survey also provided evidence to locate economic activities within the urban area. For example, a series of pottery kilns can be identified, which are all aligned along the northern and southern city boundaries. More kilns may have existed just outside the northern and eastern edge of the city, where large concentrations of misfires and wasters have been recorded in the area of the necropolises. While pottery production seems to have taken place exclusively on the outskirts of the urban area, the iron slags and glass frits which indicate a more high-quality craft production, are all located in the city centre. The recorded grinding stones occur in two types: the most common type is a simple hand-operated millstone of which numerous fragments were found fairly evenly distributed over the entire city. This can probably be attributed to the grinding taking place in individual households. Besides, a much smaller number of fragments of the Pompeian millstone type have been found. These were usually driven by donkeys and had a much larger production capacity. This could indicate the existence of professional bakeries and thus possibly the coexistence of two different baking cultures³⁹.

36 Negev 1993a, 381. Size over all: 78 m x 30 m, Atrium: 32 m x 28 m; Basilica 40 m x 18 m.

37 Among others: Shereshovski 1991, 65, 100; Rosenthal 1974 (Shivta); Tsafirir 1988 (Rehovot).

38 Measurements: Size over all 61 m x 28 m; Basilica 40 m x 21 m; Atrium 28 m x 21 m.

39 Cf. as an example of such regional cooking traditions the evidence of *tawabin* for the production of flat bread in the late Roman houses at Aila, associated with finds of hand mills: Retzleff 2003, 51.

19 As to private houses, it is interesting to note that different types of buildings seem to have coexisted, similar to what has been observed for other Negev settlements. During the archaeological survey, at least seven tower houses were observed, spread over the entire area of the city. These are generally square buildings with a side length of about 10–12 m, which have massive outer walls and elaborate interior staircases, indicating that they may have been several stories high. Some were apparently integrated into larger complexes with courtyards and outbuildings. Two of these tower houses could be examined during the excavations and proved to date surprisingly late into the 4th and 5th centuries (see below). Comparable tower houses were also found in Mamphis and Oboda, and were dated to the mid-Roman period – however, without naming convincing reasons, so that their dating should be critically reviewed⁴⁰. Also, the earlier proposed interpretation as fortified buildings no longer appears tenable in view of their location, embedded in the urban residential areas and built in a period without an external threat⁴¹. It seems more likely that this was a specific form of representative residential building type with a regional tradition. Based on the results of the geophysical prospections and the archaeological survey, the vast majority of the private dwellings appear to have formed courtyard houses of varying sizes which have a long regional tradition and are also known from other Negev settlements, such as Mamphis and Shivta⁴². However, according to the geophysical evidence, a considerable number of houses have a larger ground plan with presumed peristyle courtyards with porticoes running around all four sides. It therefore seems that, in addition to houses with a strong regional tradition, there was probably also a strong Mediterranean influence in the urban residential culture of Elusa. But this question needs to be investigated in greater depth in future studies.

20 A distinctive feature of the richer courtyard houses in other Negev towns is the occurrence of elaborate rooms with troughs in part of the ground level, usually interpreted as horse stables⁴³. In Elusa, two indirect indications also point at intensive animal husbandry in the inner-city area. On the one hand, the geochemical soil analyses carried out in the interior of the city have revealed high, localised concentrations of phosphorus. On the other hand, recent investigations by the University of Haifa in the waste mounds at Elusa, Shivta and Nessana have shown that large parts of the ash layers deposited there consisted of burned animal dung⁴⁴. This observation contrasts interestingly with the results of the excavations in the large bath complex, whose large ash concentrations consist almost exclusively of local tree and shrub species (see below). This suggests that the maintenance of this public facility mainly relied on these higher-quality fuels, which of course were rarer in the desert, while fires at the household level appear to have utilized primarily dried animal dung. Interestingly, there seem to be clear differences between Elusa and the smaller settlements of the Negev on this point. While in Shivta and the Nessana, for example, the quality of the firewood already declined from the early to the middle Byzantine period, higher quality woods (like *Raetamen Retam*, see below) were still burnt in the Elusa baths until the 6th c. C.E.⁴⁵. Apparently, the city was able to secure access to these resources longer than the minor towns of the Negev.

21 To summarise, multi-layered hybrid constellations seem to emerge at all levels of the city's structure, both in terms of the overall urban setting and the provision of public buildings, as well as at the level of private households, which all seem to show

40 Negev 1988a, 77–88; Röhl 2011, 298.

41 On their alleged defensive function: Negev 1976, 91; contrary Röhl 2011, 298 with footnote 477.

42 Hirschfeld 1995, 57–101; Kolb 2000, 290–296; Netzer 2002, 141–150; Pini 2019, 36–41.

43 Among others: Negev 1983, 101–104; Negev 1988a, 98–105. 133–139; Shereshevski 1991, 25–28. 70–73.

44 Butler et al. 2020, 1–22.

45 Bar-Oz et al. 2019, fig. S6 and Appendix, p. 1 (SI Text 1).

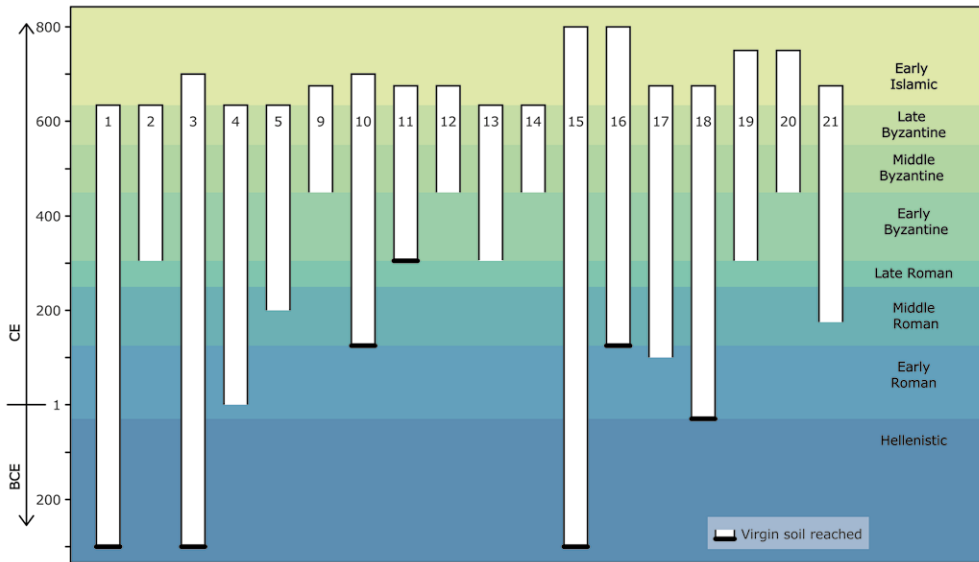


Fig. 16: Elusa (Haluzá), Comprehensive overview of the chronology of the different sondages

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varying degrees of influence from both regional traditions and Mediterranean urban culture. In this regard, much further research will be necessary.

M. H. – C. A. S.

Results of the Stratigraphic Sondages: Opening Chronological Windows

22 While non-invasive investigation methods can primarily contribute large-scale information on the structure and partly on functional aspects of the city, only stratigraphic excavations allow detailed insights into the chronological dimension. On the basis of the magnetometer results, 21 stratigraphic sondages were carried out since 2015 at sites of different urban relevance. Many of these were carried out from the surface to the original soil, so that complete stratigraphies could be observed, some of them up to 5 m high (Fig. 16). The primary targets were streets, but selected buildings of different types were also investigated. Some of the results of these excavations are presented below.

Streets

23 Both through their regular renewal and phases of neglect, streets are reliable witnesses to the development of the neighbourhoods surrounding them. This has also been proven by a total of six sondages that were carried out on various streets and junctions within Elusa (Sondages 1, 2, 3, 10, 11, 15, 18). We will present the results of Sondage 3 as an example here. The aim of this relatively small-scale excavation was to investigate an intersection of two streets at the north-western urban fringe (Fig. 15. 17). The location is bordered on one side by the northwest corner of the large bath complex (see below), while on the opposite side it is flanked by an *insula* with porticoes along the street. The street in between revealed an undisturbed stratigraphy of superimposing street layers with a total height of about 4.5 m (Fig. 17. 18. 19. 20. 21). Circa 40 different phases of occupancy were recorded, dating from the 3rd/2nd c. B.C.E. to the 7th/8th c. C.E. (Fig. 16. 21). The earliest anthropogenically affected layers above the virgin soil consist of sand accumulations that include sporadic finds. These comprise charcoal fragments radiocarbon-dated to the 3rd c. B.C.E. as well as Nabatean pottery dating to 140 B.C.E. at the earliest. Together with the

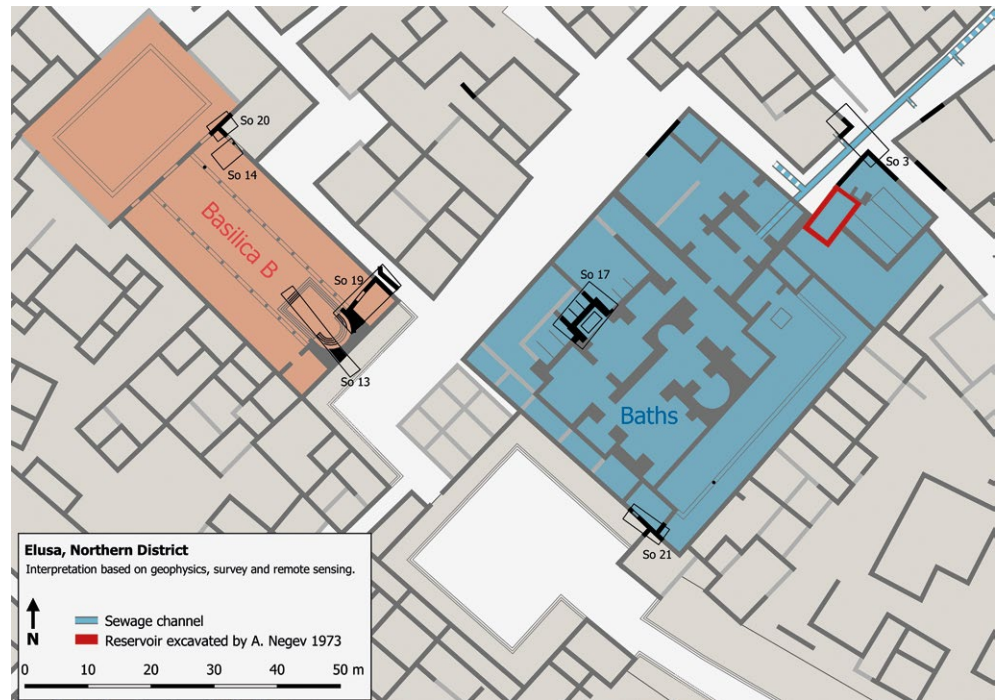


Fig. 17: Elusa (Haluzá). Preliminary plan of the northern district including Basilica B and the bath complex. The interpretation is based on geophysics, survey and remote sensing

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earliest strata from Sondage 15 in the far west, which also date to the 4th–2nd c. B.C.E. and those from Sondage 1 (3rd/2nd c. B.C.E.) they constitute the earliest archaeological evidence for a frequentation of the site. Since there are no correspondingly early finds in the more eastern areas, it could be that the western part of the rock plateau between the confluence of the two wadis was the area where the settlement was actually founded. However, it has not yet been possible to identify any building structures from these early phases. It also seems possible that at first these were only temporarily used tent sites, from which a permanent settlement nucleus gradually developed. However, this process is not yet well understood and requires further investigation.

24 These early phases are followed by an interesting lack of evidence, since neither in Sondage 3 nor any of the other trenches produced findings from the 1st c. B.C.E. It seems possible that this hiatus is connected to the specific political circumstances during the Late Hellenistic period, since at the beginning of the 1st century B.C.E., Gaza and the coastal region were occupied for several decades by the Hasmonean king Alexander Jannaeus and his widow Salome Alexandra, thus forcing the Nabataeans to shift their long-distance trade to a more southerly route avoiding Elusa⁴⁶.

25 The next detectable human activities were found in the earliest street layer which originated in the 1st c./early 2nd c. C.E. It demonstrates that in this period the consolidation of the city's road network and therefore the formation of an urban structure took place. Chronologically corresponding contexts in other sondages, which reach as far east as Sondage 10, as well as the theatre, which was presumably built in the same period, show that the settlement apparently developed rapidly during this period and already nearly reached its later expansion. However, its streets and buildings are situated about 1.5–2 m below the 4th to 6th century phases. In Sondage 3, no contemporary buildings of the 1st/2nd c. C.E. could be observed. They may be concealed by the deep foundations for the later bathhouse, respectively the portico. In others trenches (e. g. Sondage 4), building remains of this phase were found in the form of mud-brick walls on stone foundations. This earliest phase of the street – just like all the following – is composed



Fig. 18: Elusa (Haluzza), Sondage 3. Drone image of the final state. Looking SE

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Fig. 19: Elusa (Haluzza), Sondage 3. Drawing of the final state (scale 1 : 80)

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Fig. 20: Elusa (Haluzá), Sondage 3. Details of the street layers looking SE. In the background the outer corner of the bath complex (see sondage 17), in the foreground the cover of the sewer

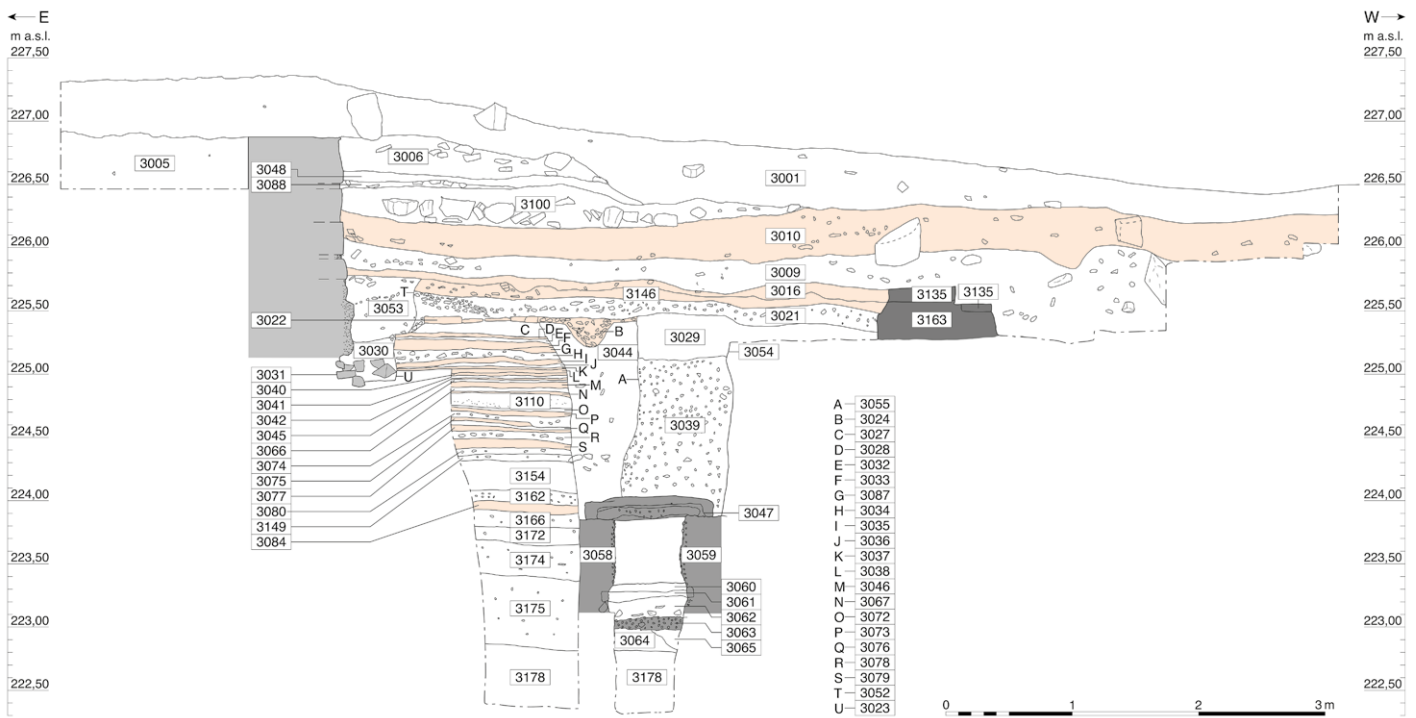
of two different layers (Fig. 20, 21): first a layer consisting of sand mixed with urban refuse such as bones, ash and pottery fragments. The second layer comprises the actual surface of the street made from small limestone chippings compressed into a hard face. In the subsequent period from the later 2nd to the mid-5th century, this type of street renewal is repeated 17 times, causing a gradual increase of the level of ca. 1.5 m, indicating an average renewal cycle of about every 20 years. Although the same basic principle of regular street renovations was observed in the other sondages, the number and dating of the individual street layers differs. Apparently, the renovation measures did not take place synchronously and only within limited areas.

26 Around the mid-5th c. C.E., a radical new construction phase took place: in quick succession, first the western building with portico, then a stone pavement covering the entire street, and finally the northern rooms of the bath complex on the east side were erected. This must have been preceded by a major levelling operation in which all the older buildings on both sides of the street were razed. Particularly interesting is the new type of pavement which was also found completely intact in Sondage 1 (cf. Fig. 22) as well as in Sondages 2, 3, 5 and 13 and near the theatre⁴⁷, while in the other street sondages there is at least indirect evidence of its existence. This suggests that the complete street network of the city was uniformly paved in this period. At all findspots the setup is homogeneous: the pavement was bedded

onto a 0.20 m layer of pure yellow sand which must have been taken from outside the settlement. Above this, well-cut rectangular stone slabs were laid out in regular rows with an orthogonal orientation to the adjacent buildings. On the reverse of three slabs from Sondage 1, red dipinti with the Greek letters ρις are preserved, which may be translated as the number 116 (see Fig. 23)⁴⁸. The three slabs belonged to the same row, which may indicate that the rows were numbered consecutively, maybe for accounting purposes. The level of the pavement is strikingly consistent over the whole network of streets at circa 225.30 m above sea level. However, a slight descent of only 8 cm from the north-western Sondage 3 over Sondage 2 towards Sondage 1 was recognized. In order to conduct rainwater out of the city, the inclination should have been exactly the opposite. Apparently, however, the intention was to channel the rainwater into the city centre for collection purposes. In fact, the geophysical prospections and a conduit found in Sondage 5 make it likely that a large cistern existed under the courtyard of the large peristyle building (see below). The uniform design of the street pavement is remarkable as it must have been expensive, it shows both municipal planning and a highly developed sense of community. If the assumptions on the number and widths of the streets are correct, a total surface area of around 58,000 sqm would have been paved, for which the extraction and transport of around 5,800 m³ of stone and 12,600 m³ of sand would have been necessary. From a stratigraphic point of view, the pavement creates a useful reference level inside the whole city dating to around 450 C.E.

47 B. Arubas, pers. comm.

48 S. Bucking, pers. comm.



21

27 Another unexpected find in Sondage 3 was a large sewer (Fig. 20. 21). It is located in a 1.4 m wide and 3 m deep construction trench, which cuts from the level of the stone pavement through all older street layers. The interior of the sewer has a width of 0.50 m and a height of 0.60 m. Its walls are constructed of small ashlar and *opus caementicium*. It is covered with large slabs of limestone (L ca. 0.8–1.0 m, W ca. 0.30–0.50 m and H ca. 0.30 m; Fig. 24) sealed with mortar. After opening the sewer, it was found to be practically free of any fill (see Fig. 25); presumably, it was cleaned in regular intervals. The channel floor was only covered by a mere thin layer of sand, which contained scant finds from the Umayyad period; the latest phase of the city. It was accessible up to 10 m to the south and more than 75 m to the North until it was blocked by broken

Fig. 21: Elusa (Haluz), Sondage 3. Drawing of the southern profile. The layers of use have been coloured (scale 1 : 60)



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Fig. 22: Elusa (Haluz), Sondage 1. Pavement of the street

Fig. 23: Elusa (Haluz), Sondage 1. Red dipinto on the bottom side of a slab of the street pavement



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Fig. 24: Elusa (Haluzá), Sondage 3. Cover of the large sewer before the opening

Fig. 25: Elusa (Haluzá), Sondage 3. The sewer was nearly free of fill and accessible on a length of circa 85 m



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Fig. 26: Elusa (Haluzá), Sondage 15. Area of the street between the two neighbouring buildings, in the foreground right the sewer. Looking E

slabs. It seems very likely that the channel continues in both directions. However, it remains unclear how far the channel system ran: there was no channel in Sondage 1 located in the centre of the city, while in Sondage 15 in the northeast of the city there was a channel with smaller dimensions (Fig. 26). In contrast, a completely different wastewater system was found in Sondage 11, namely a cesspit embedded in the road. Possibly the existence of sewers depended on local factors, such as the existence of a nearby bath. The inclinations of the sewers in Sondages 3 and 15 both point outwards from the city towards the horticultural areas located along the banks of the wadi. Charcoal from the mortar of the channel was radiocarbon-dated with a high probability to 428–536 C.E. The relative chronology indicates a construction shortly after the stone pavement of the streets. Therefore, an origin in the 2nd half of the 5th c. C.E. is very likely.

28 After the construction of the stone pavement, the previous system of repeated renewals of the street surface was interrupted for about 100 years. It seems that in this period, sand accumulating during winter storms as well as all refuse was systematically collected and removed onto the huge waste mounds in the city's periphery. Indeed, recent investigations by a team from Haifa University demonstrate a regular, possible yearly deposits of sand and waste on these mounds. This ceased in the mid-6th c. C.E.⁴⁹, precisely the same date, when in Sondage 3 the former system of repeated renewals of the street by alternating layers of sand/waste and compressed limestone chippings was resumed until it finally ended around the mid-7th c. C.E. It therefore seems that

49 Bar-Oz et al. 2016.



Fig. 27: Elusa (Haluz), Sondage 11. Umayyad building structure on the street. Presumably a treading floor of a press

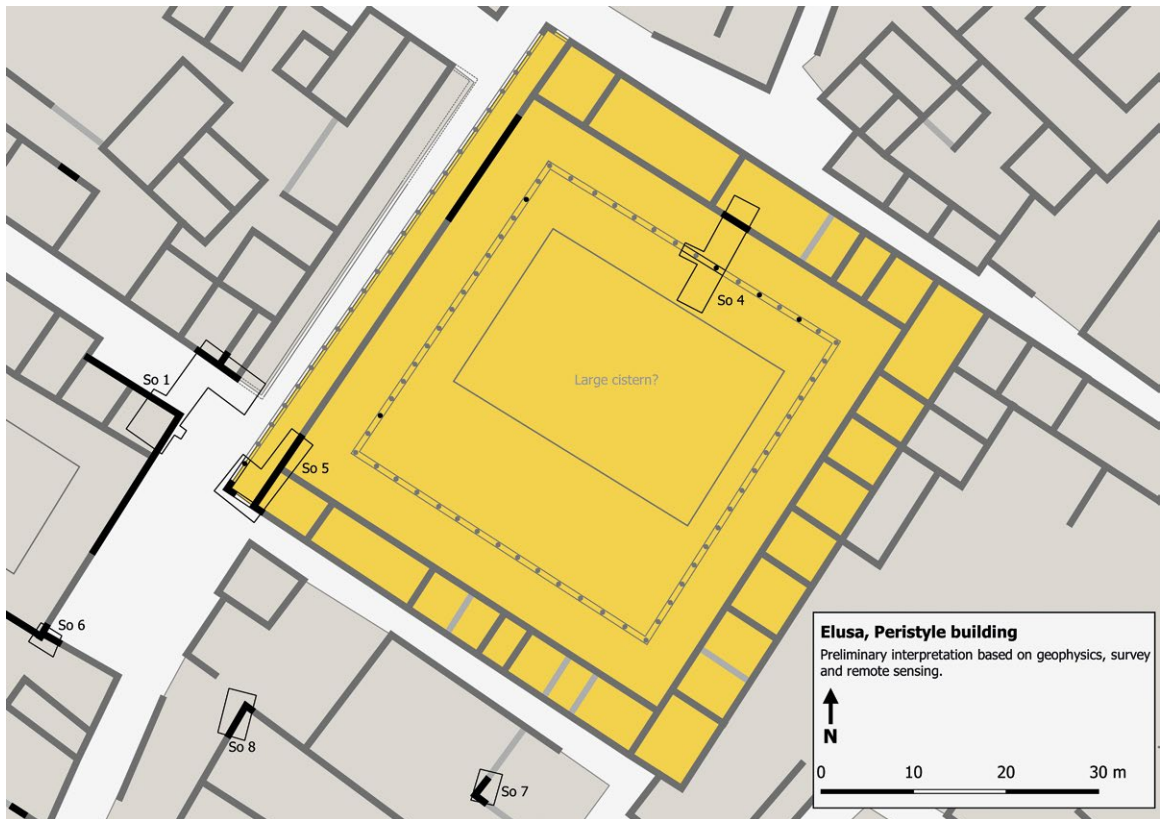
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the paving of the streets and the clearing of refuse was closely related. Evidently during a period from the mid-5th to the mid-6th c., the stone pavement was regularly cleaned and the refuse of the city was systematically transported outside to the waste dumps, which again is a sign of a highly developed communal organization in this period.

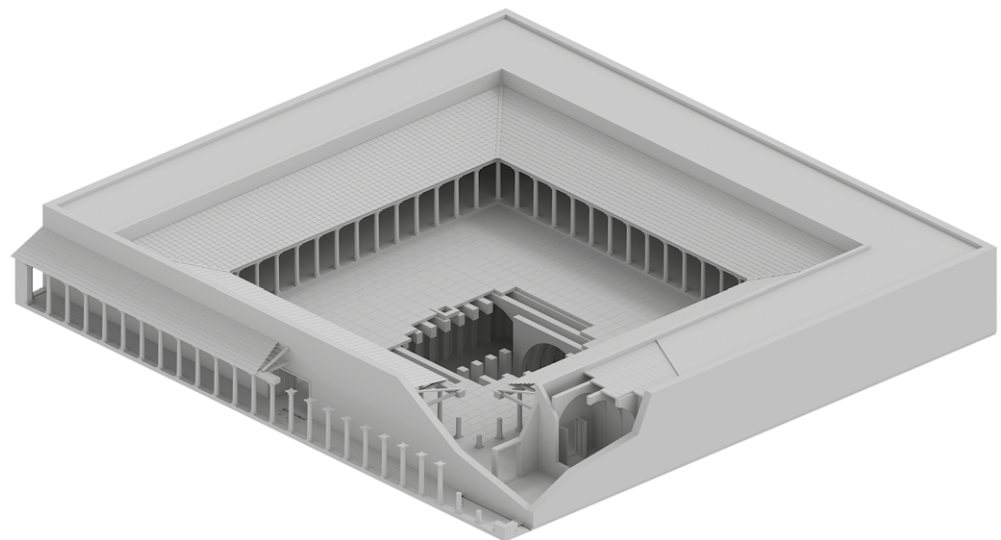
29 On top of the latest street layer and in the middle of the former road, a simple agricultural installation, probably a wine press, was constructed from reused stone material. Based on the pottery evidence it dates to after the Islamic conquest of the region (637 C.E.). This is proof that the streets and buildings of the city were already partially abandoned during the later 7th c. C.E. and agrarian production, which previously was located in farms around the city, now took place within the settlement. The same situation with another press installation in the street was encountered in Sondage 11 (cf. Fig. 27), while signs of partial conversion, partial occupation or abandonment of the street or adjacent buildings were also documented in many other sondages (1, 2, 10, 15, 18). However, the crisis of the city and its gradual abandonment seems to commence earlier, during the late 6th c., well before the Islamic conquest. As in all other sondages, the latest datable ceramic finds in Sondage 3 can be dated to the 7th or 8th c.

Peristyle (Market?) Building

30 The geophysical prospections revealed the existence of a huge peristyle building located at the intersection of several main streets right in the city centre (cf. Fig. 15. 17). It covers a surface of approx. 60 m × 60 m and consists of a central courtyard of 38 m × 36 m surrounded on all four sides by 5 m wide porticoes (cf. Fig. 28. 29). Several column drums with a diameter of 0.55 m are visible in the surface. The porticoes at the north, east and south sides are situated in front of a row of large rooms of similar sizes. At the west side, the rear wall of the portico also forms the outer wall of the building towards the street. Here, an outer portico also embellished the façade of the building and it seems that the main entrance was also situated here. Two relatively small excavation trenches were opened here: one was situated in the north portico, also covering parts of the adjoining room and the courtyard (Sondage 4), a second investigated the SW corner of the building along with the street-side portico in front of it (Sondage 5).



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Fig. 28: Elusa (Haluza). Preliminary plan of the peristyle building and its surroundings. The interpretation is based on geophysics, survey and remote sensing (scale 1 : 80)

Fig. 29: Elusa (Haluza), peristyle building. 3D-reconstruction, looking NE

31 In Sondage 4, the earliest phase of occupation is formed by the remains of an earlier building consisting of a mud brick wall (partly in situ, partly collapsed) on a stone foundation. Its orientation deviates by circa 30° from the later peristyle building. Based on the analysis of the pottery, this building can be dated to the late 1st or 2nd c. C.E. After its destruction in the early 4th c. C.E., the area was levelled using huge amounts of sand and ash. The first phase of the peristyle building was constructed over it, with stone-walls covered with white plaster. Probably in the mid-5th c. C.E. and perhaps due to destruction caused by an earthquake, this building was completely renewed while retaining the ground plan and reusing the walls of the predecessor building, which were cut at a height of about 20 cm (Fig. 31). Apparently, during this process, the porti-

Elusa - SO 04 - The peristyle building

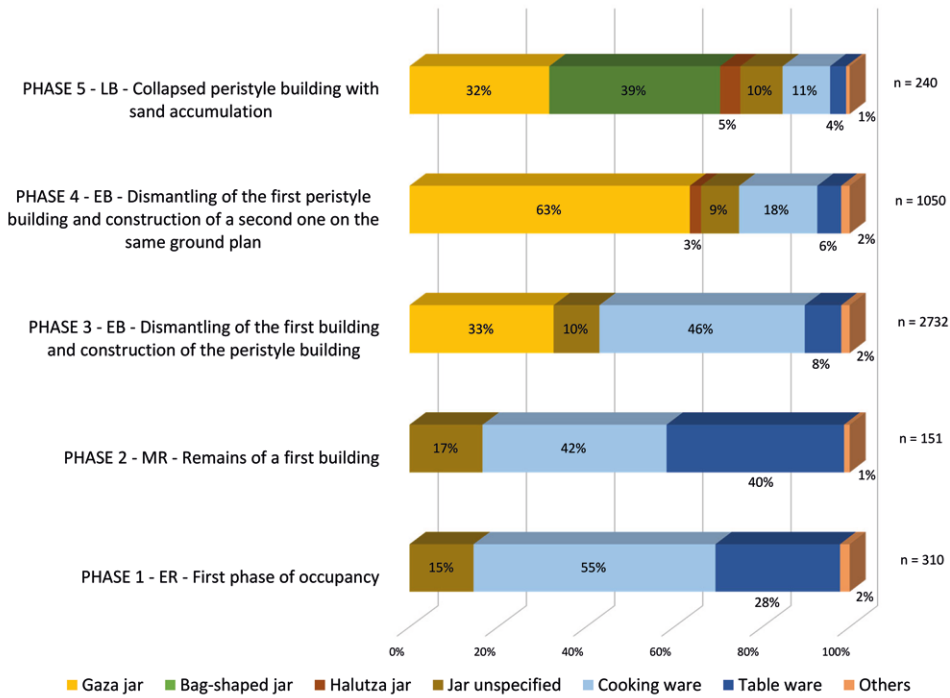


Fig. 30: Elusa (Halutza), Sondage 4. Pottery assemblage in comparison to the building phases

Fig. 31: Elusa (Halutza), peristyle building. Sondage 4, back wall of the northern portico. In the foreground stone foundations of an earlier mudbrick wall, looking NE

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co columns made of local soft limestone, were replaced. One of them was found collapsed together with its simple Doric capital (Fig. 32). In the same period, the courtyard was raised with a layer of clean, yellow sand and covered with an elaborate limestone pavement similar to the contemporaneous street paving in the rest of the city (see above). A range of different fragments of polychromatic plaster indicates a colourful decoration of the portico's rear wall. In the northern room, parts of arches and long stone slabs were found, which are typical for the construction of the roof in Negev architecture⁵⁰. The building seems to have been abandoned and collapsed during the late 6th or 7th century. Later periods of occupation were not documented, but a partial spoliation in order to use the stones of some parts of the building could be observed, such as the courtyard's pavement.

³² In Sondage 5, the southwest corner of the building including the external portico were excavated (Fig. 28. 33). The corner of the portico was composed from an L-shaped pilaster with bases on both ends. Additionally, a heavily weathered column base was found in situ 1.87 m to the north. The floor of the porticoes was probably paved with stone slabs, but in contrast to the adjacent street, it was discovered to have been robbed completely. Parallel to the building's western façade, a small channel was found which, according to its inclination, must have collected rainwater from the street,



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⁵⁰ Cf. amongst others Negev 1983, 105–109; Röhl 2011, 290 f.



Fig. 32: Elusa (Haluzá), peristyle building. Sondage 4, stylobate of northern portico of the peristyle building, in background pavement of the courtyard and a collapsed column, looking S

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Fig. 33: Elusa (Haluzá), peristyle building. Sondage 5, western corner and outer wall of the peristyle building pre-faced portico, looking NE

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conducting it towards the main entrance of the building. In fact, the results of the geophysical prospections indicate a strong rectangular anomaly in the centre of the courtyard (ca. 30 m × 20 m), which may be interpreted as a huge cistern. The pavement of the courtyard may also have served to collect rainwater. Both porticoes and channel belong to the later phase of the building, dating to the mid-5th c. C.E.

33 As to the function of the peristyle building, there are several indicators that it was used as kind of market building or *emporium*: its central location, its size and monumentality combined with the level of *décor* and its typology with an open courtyard surrounded by homogeneous large rooms which may have functioned as shops or for the stocking of goods. Furthermore, the pottery assemblage of this building (cf. Fig. 30) consisted of a disproportionately high number of the earliest form of the Gaza wine jar produced in the area around Ashqelon (see below).

Bath Complex

34 At the western end of the central colonnaded street and its small square-like extension (see above) lies a huge building complex measuring approx. 53 m × 46 m, which is a large Roman-type bath building (cf. Fig. 15. 17). Its ground plan can be reconstructed in large parts on the basis of the geophysical prospections and the wall sections still visible on the surface. It consisted of a north-south oriented bathing block (43 m × 34 m), flanked by an extensive service area in the west and an elongated peristyle courtyard in the east. In the north, there is a well-preserved tower-like water reservoir, which was partially uncovered by A. Negev⁵¹. It is likely that it was fed from a nearby well, perhaps using a *noria/saqiyah*, which can be assumed to have been on the eastern side of the water tower.

35 Sondage 17 measures 9 m × 6 m and covered part of a *caldarium* with a water tub and part of the external service area with a *praefurnium* (Fig. 34. 35. 36. 37. 38. 39). The *caldarium* shows three major construction phases. In the first phase, the massive outer walls consisting of well-built ashlar masonry with a core of *opus caementicium* were constructed (Fig. 34. 35). They are still preserved up to a height of 5.5 m. Corner pillars and concave stone blocks from the debris indicate that the room was covered by a groined vault. In this first phase, single chimneys extracting smoke from the heating system were embedded in both the northwestern and the southwestern walls (Fig. 38). According to the pottery evidence, the outer wall of the bath complex and its courtyard rooms were erected in the late 2nd or early 3rd c. C.E. In a second phase, a far-reaching renovation and reconstruction took place: the outer wall towards the service area was replaced and the *hypocaustum* was completely rebuilt. For this purpose, six parallel rows of brick pillars (each 1.2 m × 0.9 m, height of 0.8 m) were erected (Fig. 36), which supported small barrel vaults and a floor of limestone slabs above it⁵². The *hypocaustum* opened onto the service area with a large furnace opening (2.60 m height × 0.65 m width; Fig. 37). In this phase, the flue was managed by a system of *tubuli* which were now embedded into the side walls; Fig. 38). Inside the *caldarium*, and on top of the *hypocaustum* a pool was installed (3.2 m × 1.8 m, height 0.45 m). Above the *praefurnium* a gap in the pool enclosure indicates that here a metal plate (*testudo*) for heating the pool was attached (cf. Fig. 39). The *caldarium* and its pools were completely covered with marble, as evidenced by numerous mortar imprints, isolated fragments of Proconessian marble and various wall plugs. Apparently in the same phase, the service area was encircled by walls and the furnace was spanned over by wide arches. A massive ash and charcoal deposit of 3.4 m thickness attests to the intensive use of the furnace. In the third construction phase, a water pipe system was being built. In order to do this, the wall above the furnace was penetrated at three points, with pipes being laid in order to conduct water from outside into the pools. This part of the building was abandoned in the late 6th or early 7th c. C.E. In the following years, the ruin was stripped of all recyclable building materials and the building finally collapsed at the end of the 7th c. C.E. (pottery evidence).

36 Sondage 21 (7 m × 3 m) was situated at the southern edge of the complex in order to investigate some rooms on the southern side of the bathhouse's courtyard, its outer wall and an adjacent portico at the outside. Within the sondage, a small door (1.02 m wide) was discovered which apparently was a side entrance to the bath complex (Fig. 40), while the actual main entrance seems to have been on the north side. An exceptional find was made in this area: lying on the debris of the building, a fragmented inscription was found, presumably part of a pedestal (Fig. 41). The inscription is a dedication of the city of Elusa for Constantius I and his Caesar Flavius Valerius, dating

51 Negev 1976, 89.

52 Similar Late Antique-Early Byzantine changes can be observed in several baths in the region: cf. Hoss 2005, 50–61, cat. 40. 42. 55. 84. 85. 89. 116. 134. 139.



Fig. 34: Elusa (Haluz), bath complex. Sondage 17, in foreground the service area with a well preserved *praefurnium*, in the background a pool of the *caldarium*, looking E

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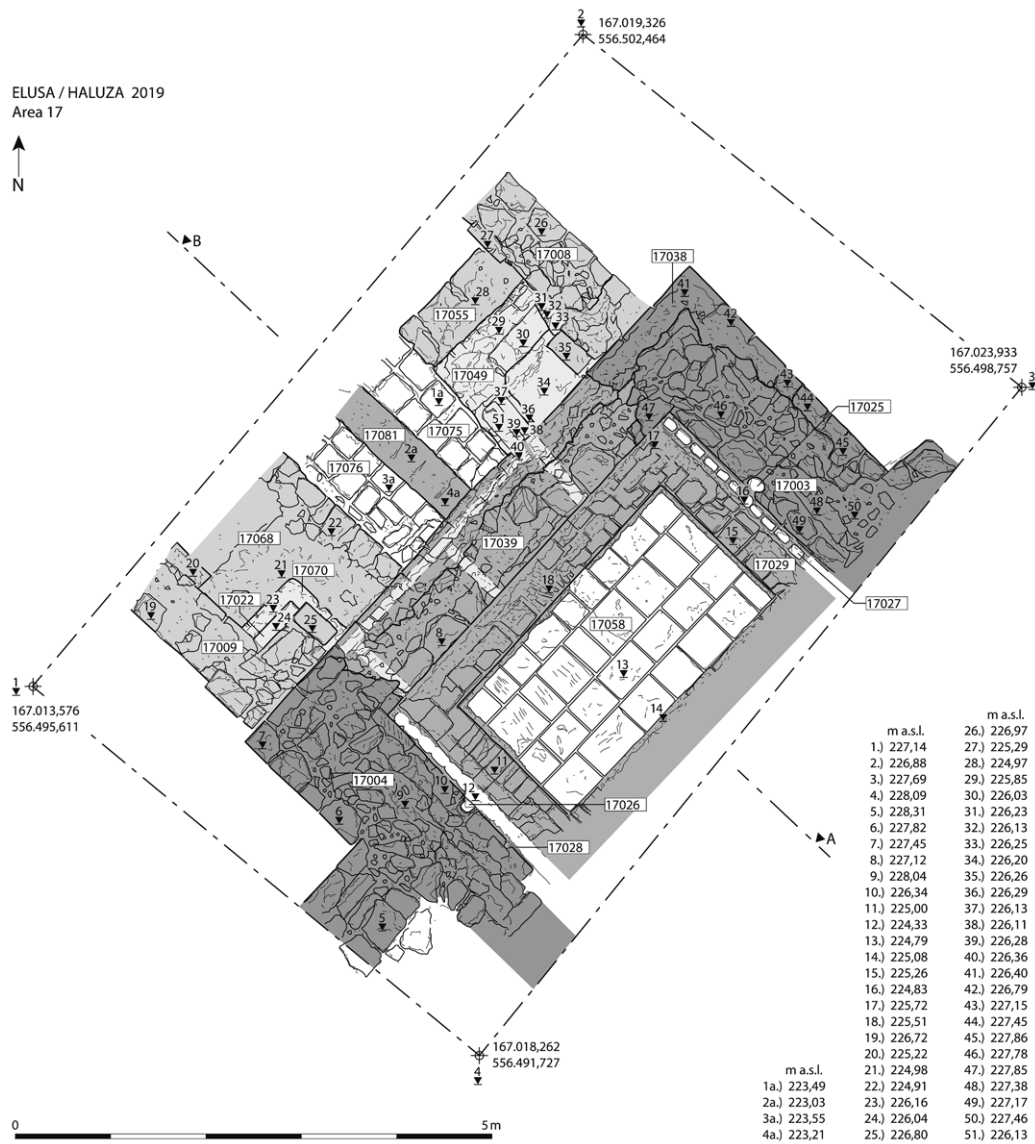


Fig. 35: Elusa (Haluz), bath complex. Sondage 17, drawing of the final state (scale 1 : 80)

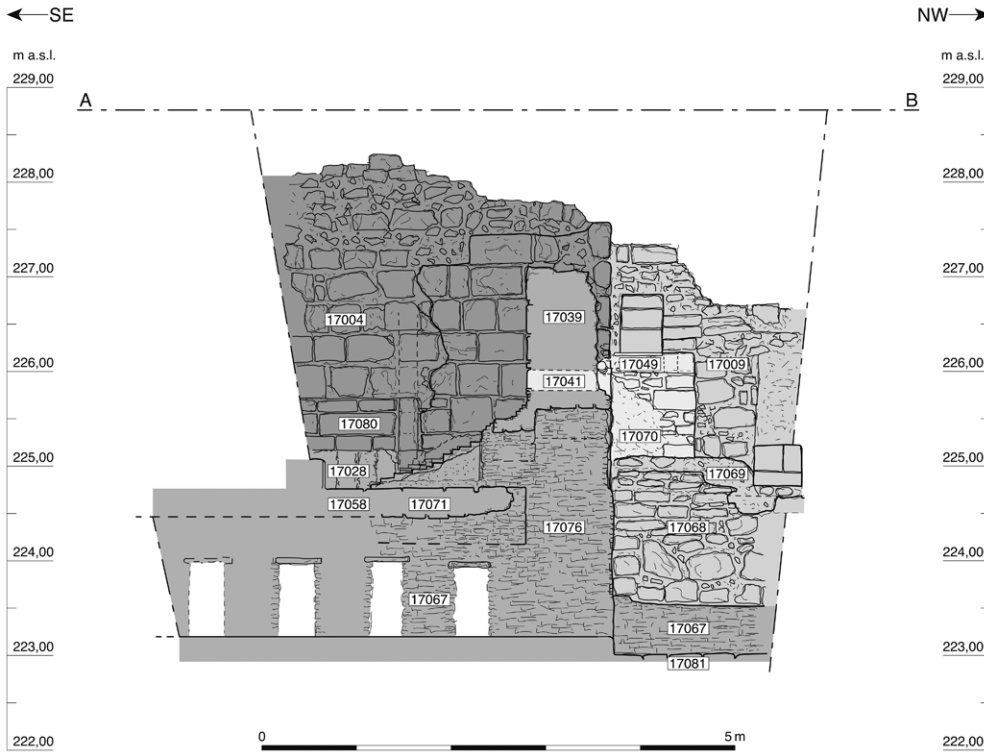


Fig. 36: Elusa (Haluzá), bath complex. Sondage 17, section looking S (scale 1 : 80)

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Fig. 37: Elusa (Haluzá), bath complex. Sondage 17, view onto the *praefurnium*, looking SE

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to 305/306 C.E.⁵³, which probably was part of a statue group honouring the tetrarchs. The latest renewal of the portico flooring can be dated to the 6th c. C.E. and the area was finally abandoned by the second half of the 7th century on base of the pottery found in the layers underneath the building's collapse.

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53 For a detailed discussion see: Di Segni 2018.



Fig. 38: Elusa (Haluzá), bath complex. Sondage 17, detail of lateral wall, pool enclosure and tubuli in between, looking NE

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Fig. 39: Elusa (Haluzá), bath complex. Sondage 17, detail of the pool of the caldarium. The gap towards the praefurnium indicates a missing testudo

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Fig. 40: Elusa (Haluzá), bath complex. Sondage 21, southern building boundary with side entrance and paved street or portico, looking N

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Fig. 41: Elusa (Haluz), bath complex. Sondage 21, limestone block with inscription found not *in situ* in front of the façade of the bath. It's a dedication of the citizens of Elusa for Constantius I and his Caesar Flavius Valerius (305/306 C.E.)

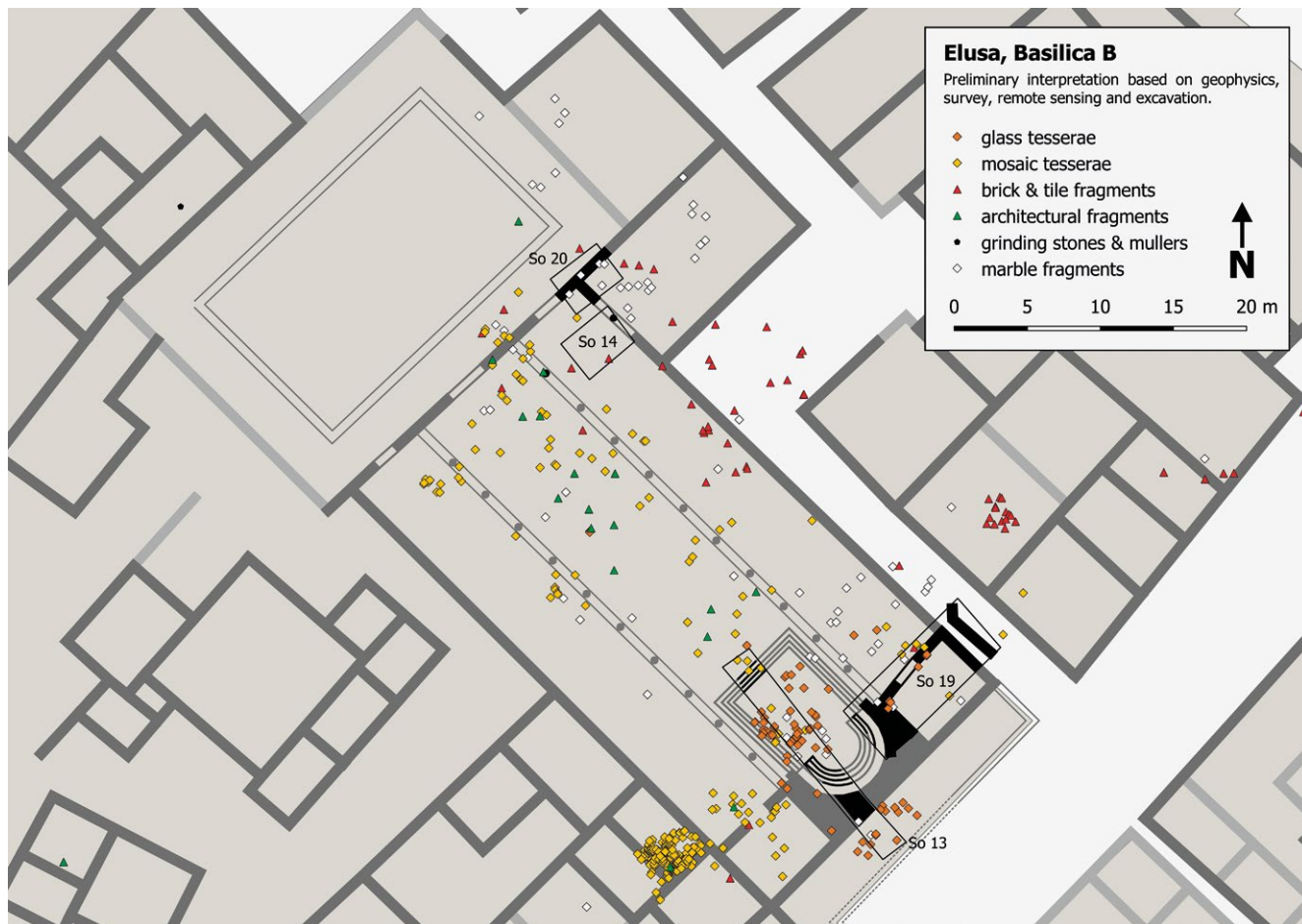
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Basilica B

37 At the western end of the above-mentioned colonnaded street and its plaza-like extension – and thus in the immediate vicinity of the bath building complex – another large church building, Basilica B, was identified (Fig. 15. 17). The apse and atrium of the church are still rudimentary recognizable in the terrain and the archaeological survey revealed a high concentration of materials indicative of church buildings, such as marble fragments, column drums, roof tiles and stone tesserae from floor mosaics as well as glass tesserae from vault decorations. The outer walls of the church can be seen to some extent in the magnetometry. From this data it appears that the building complex was ca. 60 m long and had a distinct northwest-southeast orientation, integrating itself into the surrounding buildings.

38 Four sondages have been carried out on this building so far (cf. Fig. 42): one in the eastern apse (Sondage 13), one in the adjoining room to the north (Sondage 19), and two at the northwestern end of the church (Sondages 14 and 20). A massive stratum of building debris was found in all four trenches, covering the ruins of the church, which had walls preserved up to a height of 2 m. The excavation discovered that the building had already been robbed of most of its decorative fittings by the end of the Late Byzantine period. Nevertheless, based on the findings, the essential features of the basilica and its high-quality decoration can be reconstructed. The church shows the rectangular plan of a three-aisled basilica of 40.6 m × 20.5 m with an embedded apse in the southeast. In front of its western facade was a somewhat wider *atrium* of about 28 m × 21 m, protruding symmetrically beyond the longitudinal walls of the church by at least 2.2 m. The external walls of the church have a thickness ranging from 0.60 m (entrance wall) to 0.82 m (side walls) and consist of a double-shell masonry made of well-joined local limestone ashlar. The columns of the nave (diameter 0.49 m) were also made of this local stone. At its eastern end, the outer wall of the church enclosed the apse, which was therefore not visible from the exterior (Fig. 43. 44). The apse opens into the interior nearly over the entire width of the central nave (approx. 7 m). Within the apse and set against its outer wall, the remains of a *synthronon* consisting of four steps were found. It was clad with slabs of Proconnesian marble, fragments of which were found *in situ*.

39 In a first phase, the floor in the apse was on the same level as that of the nave and consisted of local lime slabs. In a second phase, the floor in the presbytery was raised by 0.5 m and covered with large slabs of Proconnesian marble (1.60 m × 0.60 m), of which only imprints in the mortar and some fragments have been preserved *in situ*.



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Fig. 42: Elusa (Haluza), Basilica B. Survey finds on the preliminary interpretation (scale 1 : 500)

The entrance to the presbytery now was fitted with a small flight of four steps. North of the apse, a side room was investigated in Sondage 19, that may possibly be interpreted as a *pastophorium* (Fig. 45). It is limited in the north by the continuation of the external wall (as shown in Sondage 20) and opens to the northern aisle with a wide door that has a well-preserved threshold (approx. 2.50 m × 1 m). The lead and metal core of the door hinges are still in situ. The pavement of this room consisted of well-cut slabs of the local limestone.

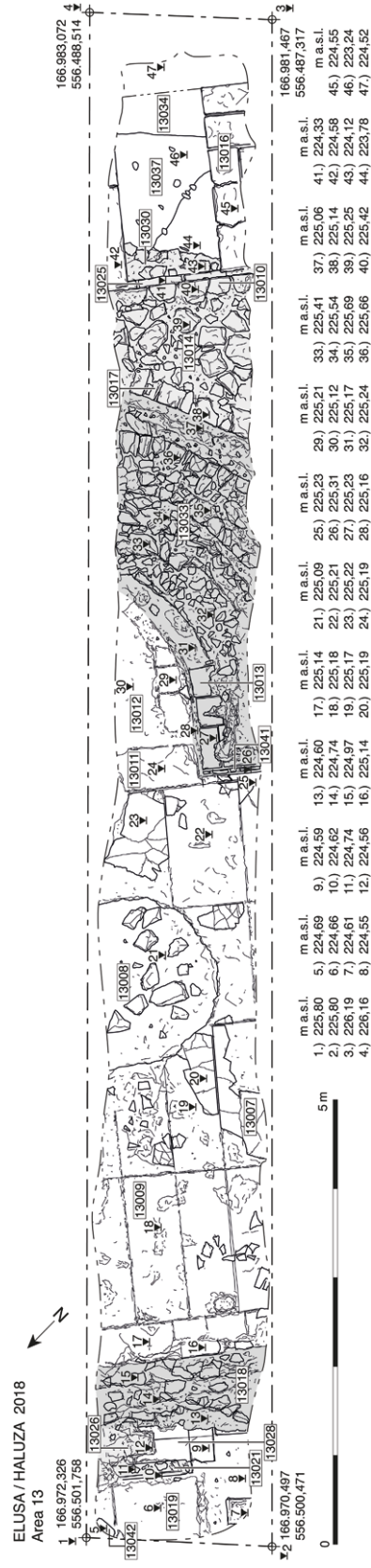
40 Probably in connection with the renovation of the presbytery, the floors and walls in the nave were also covered with Proconnesian marble, as can be seen from some fragments preserved in the northern aisle (Sondage 14). The decoration of this second phase shows a distinctly higher quality than that of the first. This also includes some coloured glass mosaic tesserae still adhering to a curved stone block originating from the vault as well as fragments of the chancel screens of black and white marble (Fig. 46. 47. 48). In addition, some fragments indicate that the capitals were also made of marble.

41 As to the chronology of the building, it can be stated that the construction of the church took place in the 1st half of the 5th c. C.E., while the elaborate re-decoration occurred in the second half of the 5th or in the early 6th c. C.E. The church was probably abandoned and robbed (spoliated) at the end of the Late Byzantine period. The basilica shows numerous parallels to other church buildings in the Negev region⁵⁴. In both its

54 For example: Mampsis, West church (Negev 1988b, 52–63); Oboda, North church (Negev 1997, 107–122); Ruheibe, North church (Tsafrir 1993, 299–302); Soboda, South church (Rosenthal-Heginbottom 1982, 63–83).



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Fig. 43: Elusa (Haluza), Basilica B. Sondage 13, drone image of the final state of the section through the apse. Parts of synthronon and marble pavement still in situ

Fig. 44: Elusa (Haluza), Basilica B. Sondage 13, drawing of the final state (scale 1 : 80)



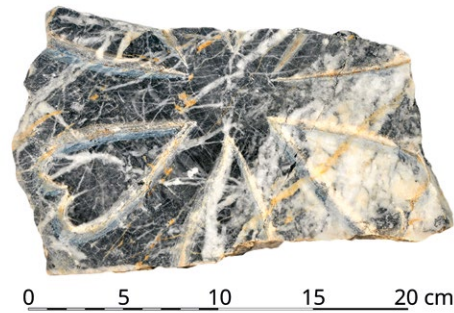
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Fig. 45: Elusa (Haluzá), Basilica B. Sondage 19, drone image. In the foreground entrance with threshold to the northern *pastophorium* with preserved paving



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Fig. 46: Some of the glass mosaic tesserae registered during the urban survey



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Fig. 47: Elusa (Haluzá), Basilica B. Sondage 19, marble fragment with cross probably belonging to the chancel screen



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Fig. 48: Elusa (Haluzá), Basilica B. Sondage 19, another stone fragment featuring a cross

size and the quality of the building and furnishing, it is in no way inferior to the so-called East church, which has been named a possible cathedral of Elusa by A. Negev⁵⁵.

F. J.

Tower Houses

42 During the 2017 and 2018 seasons, two tower houses were investigated, examples of which are characteristic residential buildings in the Negev settlements (see above) (Fig. 15). The main goal of the probes that were carried out was to check the dating of these structures since there is as yet no reliable chronology for this type of monument.

43 During the 2017 campaign, a tower house complex in the SW part of the city was examined by Sondages 9 and 12 (Fig. 15. 49). The former concentrated on the actual tower, the latter on the portico on the southern side of the courtyard. In Sondage 9, the eastern side of the approx. 10 m × 9 m rectangular tower was uncovered still pre-



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Fig. 49: Elusa (Haluzá), tower house B. Sondage 9, drawing of final state (scale 1 : 75)

Fig. 50: Elusa (Haluzá), tower house B. Sondage 9, eastern façade of the tower house B made of huge limestone ashlars

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Fig. 51: Elusa (Haluzá), tower house B. Sondage 9, staircase filled with building debris, looking SE

served to a height of approximately 5.5 m (Fig. 50). The outer wall consists of a 0.9 m thick, two-shell masonry of well-cut and closely bonded ashlars of exceptionally large dimensions, with an average height of 0.50 m their length ranges between 0.60 and 1.80 m. It follows that the appearance of the tower building must have been strikingly monumental. Inside its southeastern corner, a well-preserved, spacious staircase (about 5.50 m × 4.50 m) was revealed, whose four-sided stone steps and central pillar are still intact up to a height of 3.20 m (Fig. 51). A white plaster covered the interior walls of the staircase. The pottery from the fill of the foundation trench suggests a construction date in the second half of the 5th c. C.E. The building and its courtyard were in use until the late 6th or

early 7th c. C.E. From the 7th c. C.E. onwards, the tower house gradually collapsed.

44 In order to test this surprisingly late date, in 2018 another tower house was examined in Sondage 16 (Fig. 15. 52). For this purpose, a building was chosen that had already been cursorily excavated by A. Negev, but was never published. It is located in a relatively central position in the western part of the city and has slightly larger dimensions (about 13.5 m × 12.5 m) as well as a monumental construction technique of oversized ashlars comparable to the other tower house investigated by Sondages 9 and 12. Like the former, it was also divided into several rooms on the ground floor and had a similarly-sized staircase in its southeast corner. In Sondage 16, the first phase of use after the construction of the building could be dated on the basis of pottery to the 4th c. C.E., followed by various other levels of use during the course of the 5th c. C.E. In the later 6th c. C.E., the building seems to have been abandoned and it collapsed by the beginning of the 7th c. C.E. Due to the unexpectedly late dates of both the investigated tower houses, a critical revision of the chronology of this building type should be considered in the future.

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Fig. 52: Elusa (Haluzá), tower house A. Sondage 16, drone image looking N



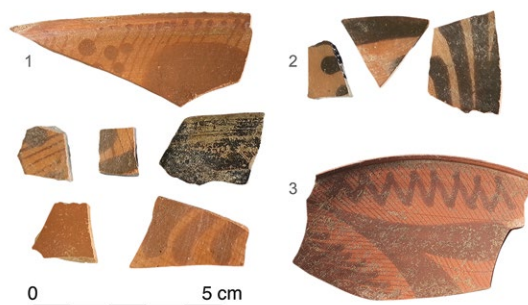
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The Pottery Evidence

45 The excavations carried out in Elusa so far produced large amounts of ceramic finds collected from all the sondages. Ceramic sherds, parts of oil lamps and figurines and ceramic building material were sorted and examined by the author with the aid of the excavation team. The ceramic evidence covers the range of occupation periods discovered in Elusa from the Hellenistic period (3rd–2nd c. B.C.E.) until the Early Islamic period (7th–mid-8th/early 9th c. C.E.), with most of the finds dating to the Early and Late Byzantine periods (4th through early 7th c. C.E.).

Ceramic Finds of the Hellenistic and Roman Periods

46 Only a small number of sherds dated to the Hellenistic period were discovered at the site, usually in the deepest levels of a few sondages. These may have been deposited when the site was used mainly as a caravan stop on the Incense Road between Petra and Gaza in its earliest phase. Black-glazed sherds of the Hellenistic period, sherds of imported ESA ware and Nabataean sherds of the 1st through early 3rd c. C.E. were discovered in the earliest building revealed in the excavation in southern edge of Sondage 1 (Fig. 1 and 53, 2). Otherwise, Nabataean sherds of the Roman period were discovered mainly in the lower levels of the sondages and sometimes on the surface of the site. Nabataean vessel sherds and lamp fragments dated to the early 1st c. B.C.E. and the 1st–2nd c. C.E. were recovered below the earliest street in Sondage 3. Part of a Nabataean painted ware bowl of the 2nd – early 3rd c. C.E. was discovered on a grave on the perimeter of the site (Fig. 53, 3). It is decorated with a bold ›Balanos‹ (*Balanites aegyptica*) motif like painted ware bowls of the post-annexation period discovered in Petra⁵⁶.



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Fig. 53: Pottery finds from Elusa (Haluzia)

Local Haluzia Ware of the Byzantine Period

47 At least four pottery workshops producing local ›Haluzia‹ ware vessels have been detected at the site and there is a possibility that other kilns existed in the area of the eastern cemeteries. This kind of ware is rather easy to discern in the assemblages due to its light colour that often has a green or yellow cast. Fragments of green-coloured kiln wasters have been found on the north side of the site and a pottery workshop with wasters of this kind has been excavated ca. 50 m south of the theatre⁵⁷. Chemical analysis of Haluzia ware wasters, designated Group D by Holmqvist and Martín-Torres, showed them to be made from highly calcareous clay⁵⁸.

48 The Elusa workshops produced a variety of vessels in the Byzantine period. Subsequent excavations at Elusa have revealed a tentative assemblage of locally produced vessels, particularly small, carinated bowls, as well as larger bowls, basins, jugs, juglets and imitation bag-shaped jars in contexts dated to the Early and mid-Byzantine periods (350–550 C.E.)⁵⁹. Excavations in other sites in the central Negev have also uncovered Haluzia ware vessels, e. g., the site of Shivta and Bir Asluj/Mashabei Sade⁶⁰.

56 Johnson 1987, 45; Erickson-Gini – Tuttle 2017, 119. 128 f. with fig. 13, 4.

57 Bucking – Goldfus 2012.

58 Holmqvist – Martín-Torres 2011, 73.

59 Bar-Oz et al. 2016, fig. 5.

60 For Shivta: Tepper et al. 2018, fig. 16, 3; for Bir Asluj: Erickson-Gini – Mamalya forthcoming.



54

Fig. 54: Pottery finds from Elusa (Haluzza)

49 One particular vessel, called the ›Haluzza jar, imitates the shape of Gaza wine jars of the Early and mid-Byzantine period (350–550 C.E.), but it is made from a light fabric (Fig. 54, 1)⁶¹. Petrographic analysis of a jar of this type from Oboda (Avdat) revealed that it was produced at Elusa⁶². Despite its local availability, the recent excavations at the site have revealed that it lags far behind the presence of Gaza wine jars and bag-shaped jars, both of which were produced in the southern coastal plain. In the Elusa excavations, Haluzza jars made up only 4% of the Byzantine assemblage, comparable to other sites in the Negev Highlands such as Shivta, Avdat and the nearby site of Bir Asluj/Mashabei Sade.

The Rise and Fall of the Gaza Wine Jar at Elusa

50 During the 2016 season, the entire ceramic assemblage of recovered ceramic finds from the topsoil

and Phases 5 to 1 of Sondage 4 was sorted and counted to obtain the percentages of diagnostic vessels and objects (Fig. 30). The Gaza wine jars (GZJ), dated using Majcherek's Gaza wine jar chronology⁶³, were found to dominate the ceramic assemblage throughout the Late Roman and Byzantine periods and particularly in the period between the mid-3rd and mid-6th c. C.E.

51 The results reflect trends noted by the author throughout all the excavated areas and in the trash mounds of the Early and mid-Byzantine period located north of the site near Sondage 3 and on the southern perimeter of the site, both of which were excavated by a team from Haifa University in 2015⁶⁴. In Phase 3, the Gaza wine jars made up 42% of the diagnostic assemblage and this is comparable to the results of the Haifa University excavations in the southern trash mound in Elusa and also in Shivta⁶⁵.

52 Gaza wine jars were produced throughout the southern coastal plain in large quantities and they were apparently brought to Elusa and other central Negev sites due to the intensive production of wine in the region between the mid-3rd and early 7th c. C.E. The earliest form of Gaza wine jar, Majcherek's Form 1 (1st–3rd c. C.E.; cf. Fig. 54, 2) was recovered solely in assemblages of the mid to end 3rd c. C.E. in Phase 1 in the peristyle building in Area 4, suggesting that genesis of wine production in the Negev Highlands took place sometime after the mid-3rd c. C.E. The Form 1 jar was replaced sometime in the Early Byzantine period in the 4th c. C.E. by Majcherek's Form 2, which dates approximately between 350 and 450 C.E. This form was slightly modified in the next period with the appearance of Majcherek's Form 3 (Fig. 54, 3), which is well-represented in mid-Byzantine contexts at Elusa until around the mid-6th c. C.E. Thereafter, there is a significant drop-off in its occurrence at Elusa and indeed in other sites in the Negev Highlands such as Shivta Area O where they drop to 6% of the assemblage⁶⁶. Thus, in the Late Byzantine period (mid-6th to mid-7th c.) the latest form of the Gaza wine jar (Majcherek's Form 4) is largely replaced by bag-shaped amphorae, Pieri's LRA 5/6⁶⁷.

61 Erickson-Gini – Mamalya 2019; Erickson-Gini – Mamalya forthcoming, fig. 5.

62 Fabian – Goren 2002, figs. 2–4.

63 Majcherek 1995.

64 Bar-Oz et al. 2016.

65 Fuks et al. 2020, 6.

66 Fuks et al. 2020.

67 Pieri 2005, 106–114.

53 The dramatic rise and fall of the numbers of Gaza wine jars in Elusa and other sites in the Negev Highlands is related to their elongated shape and function as commercial containers for wine that was exported from the southern coastal region to far-flung locations abroad in the Byzantine period. Until the mid-6th c. C.E., wine produced in the Negev Highlands appears to have been a significant component in the export of wine from the southern coastal plain. Revenues from that trade probably supplied the funds for the expansive construction at Elusa and the immediate region. The reason for the profound decline in occurrence of Gaza wine jars at Elusa and other sites in the Negev Highlands from the mid-6th c. C.E. may possibly be found in the direct impact of the Justinian plague (541–542 C.E.) that entered the region by way of Pelusium and the indirect impact of a contracting market abroad⁶⁸.

Bag-Shaped Jars in the Late Byzantine and Early Islamic Periods

54 Bag-shaped jars (BSJ), corresponding to Pieri's LRA 5/6, tend to predominate in the assemblages of the Late Byzantine and Umayyad periods. From the mid-6th c. C.E. there appears to be a clear preference for bag-shaped storage jars (39% of the assemblage in Sondage 4, Phase 5; Fig. 30) comparable to the findings of Haifa University's excavations in Shivta and Nessana⁶⁹. Compared to earlier forms of bag-shaped jars, the form that appears frequently from the mid-6th through 7th c. has a squat, bulging neck and slightly everted rim. Excavations in sites in the Negev Highlands such as Shivta and Oboda (Avdat) have revealed their use as storage jars that were sunk into the dirt floors of dwellings in the Late Byzantine period⁷⁰. The bag-shaped jar appears to have been a multi-functional storage vessel that was less suited for long-distance trade⁷¹. The small number of the bag-shaped jar in assemblages from before the mid-6th c. suggests that its quantitative appearance may be used for dating assemblages of the later phase of the Late Byzantine period between 550 and the early 7th c. C.E. Bag-shaped jars become the dominant vessel in assemblages of the Umayyad period in Shivta and Nessana and they also appear occasionally in large, heavy forms (pithoi).

Other Vessels of the Byzantine Period

55 The main type of imported storage jar discovered in Late Byzantine contexts at Elusa is Riley's Late Roman 1 amphora (LR1)⁷². However, this jar appears in minor quantities. Fine wares include modest amounts of imported vessels of the mid- and Late Byzantine period (second half of the 5th through early 7th c. C.E.) and African red-slipped bowls of the Early Byzantine period (4th – early 5th c. C.E.). The imported fine ware bowls appear to have been derived from North Africa in the Early Byzantine period while in the mid-Byzantine period the source shifted mainly to Cyprus. Another fine ware, called Byzantine Fine Ware, was uncovered in Late Byzantine contexts. These were either small bowls with incised wavy decoration or parts of small juglets with incised decoration like those described by Magness⁷³. Parts of wheel-made ceramic pipes were uncovered in the area of the bathhouse in Sondage 3 (Fig. 55, 1).

56 Moulded lamps of the Early Byzantine period (3rd through early 5th c. C.E.) found in Elusa are types that were probably produced in Petra before the mid-5th c. C.E.⁷⁴. Wheel-made ceramic lamps, called ›sandal-lamps‹ and dating to the Late Byzantine period (second half of the 5th through 7th c. C.E.) are commonly found in Byzantine and Early Islamic

68 Fuks et al. 2020, 9.

69 Fuks et al. 2020, 6.

70 Erickson-Gini forthcoming.

71 Langgut et al. 2015a, 5.

72 Riley 1981, 120.

73 Magness 1993, 167–170.

74 Erickson-Gini 2010, 156 with figs. 4, 61–63.



Fig. 55: Pottery finds from Elusa (Haluzá)

contexts throughout southern Israel⁷⁵. A rare type of molded lamp with patches of plaster was discovered in a very worn condition inside the sewer in Sondage 3 (Fig. 55, 2). A lamp with similar features published by Rosenthal and Sivan (Rosenthal – Sivan 1978, 128 no. 528) dated to the Byzantine period or post-Arab conquest. Byzantine cooking wares produced from thin, brittle fabrics were discovered in significant amounts and these include closed cooking pots, casseroles, frying pans, lids and cooking ware jugs. The Late Byzantine cooking pots are easily identified by their triangular, everted rim corresponding to Magness' Cooking Pot Form 4A⁷⁶.

Evidence of Occupation in the Umayyad Period

57 Ceramic vessels of the Early Islamic period were generally rare in and around Elusa. A painted ware sherd of the Umayyad period was discovered in Sondage 2 (Fig. 55, 3) and on the surface of the site. In the 2017 season, Sondages 9, 10 and 11 produced the first definitive ceramic wares of the Umayyad period (mid-7th – mid-8th c. C.E.). The Umayyad assemblage includes Coptic painted ware bowl sherds and Fine Byzantine Ware cups with painted lines. This material was discovered near the surface and over the earlier Late Byzantine phases. A small amount of closed cooking pots and casseroles of the Umayyad period were also revealed. They are types that developed out the Late Byzantine tradition, but they tend to be made from a thicker ware and the casseroles are deeper with heavy, horizontal handles.

58 Only two pottery sherds identified as belonging to the Abbasid period (post mid-8th c. C.E.) were included in the Early Islamic assemblage and this may indicate that the city was largely abandoned before the end of the 8th c. C.E.

British Mandate Period

59 Sherds of Black Gaza ware were collected from the surface of Elusa in the course of survey and excavations. This kind of ware began to be produced around 1700 and although it is generally dated to the Ottoman period, its production in Gaza peaked in the 1940s under British rule (1917–1948) when over sixty workshops operated⁷⁷. In this period several buildings were raised on the western perimeter of the site and a weekly market was held directly over the ruin of the ancient buildings and thus the Black Gaza ware sherds were most likely deposited around this time.

T. E.-G.

Archaeobotanical Evidence

60 The examination of plant remains from anthropogenic deposits has become standard in archaeological excavations as it can provide information on environmental reconstruction, human land use and dietary habits.⁷⁸ In this regard, the investigations in Elusa can complement the already intensive archaeobotanical analyses in the small-

75 Rosenthal – Sivan 1978, 122.

76 Magness 1993, 239 no. 2.

77 Israel 2006, xi; Israel – Saidel 2021, 132 fig. 18.

78 Among others: Jacomet – Kreuz 1999.

er Negev settlements⁷⁹. However, in order to obtain reliable results, it is important to sample a wide variety of archaeological contexts.

61 Under terrestrial conditions, as in Elusa, plant remains are often preserved when they were charred by the exposure to fire or heat. Such carbonized remains usually make up the largest part of the detectable plant remains. They occur, for example, during waste disposal by burning in hearths/fireplaces, or when handling plants in connection with food preparation.

62 In the 2018 and 2019 campaigns, a total of 117 selected stratigraphic units were systematically sieved. Besides, 23 sediment samples (260 litres) were semi-floated resulting in the recovery of approx. 2,500 macroscopic remains of cultivated and wild plants. Most of the samples originate from streets where plant remains, along with other urban waste and ash residues, were intentionally deposited as a preparatory layer for the actual street surface (Sondages 10, 11, 15 and 18). Another larger group comes from the service area of the bath complex (Sondage 17; Fig. 37). The majority of the sampled contexts dates to the Early to Late Byzantine period.

Seeds and Fruits

63 The samples processed so far provided 1,300 remains of seeds and fruits with a large variety of cultivated and wild plant species that are currently under examination at the Institute for Integrative Prehistory and Archaeological Science at the University of Basel. A detailed analysis is still pending, so no more precise figures can be given at the moment. However, even at this stage of processing, a wide range of crops can already be identified. Barley (*Hordeum vulgare*) seems to have been the main cereal. Wheat (*Triticum* spec.), which has not yet been specified, was also used. Lentil (*Lens culinaris*) was the most important vegetable protein source. Furthermore, lentil vetch (*Vicia ervilia*) has been found so far. It possibly served as food for domestic animals. Also, a wide variety of fruits and nuts were used. Vine (*Vitis vinifera*), date (*Phoenix dactylifera*) and fig (*Ficus* cf. *carica*) have been most frequently and regularly represented. These species were most likely cultivated on site. Whether the trees were irrigated can possibly be revealed by analysing the wild plant species. Walnut (*Juglans regia*) and olive (*Olea europaea*) are also recorded. Future investigations will show whether these species were cultivated locally or whether they were imported, e. g. from the wetter Jordan Valley or from coastal regions.

M. K.

Carbonized Wood Remains (Anthracology)

64 A further 1,200 macro remains of carbonized wood samples are currently being analysed in the Laboratory of Archaeobotany and Ancient Environment at Tel Aviv University. They originate primarily from street horizons and the *prae-furnium* of the Roman bath. The underlying assumption in anthracological studies is that such deposits are more likely to represent the accumulated remains not only of wood collected as fuel, but also 'secondary' fuels, deriving from worked wood, defunct timber, horticultural refuse and wooden crafts. Hence, potential biases in taxon representation introduced by context-related variation are, to some extent at least, minimized⁸⁰. So far 617 samples have been microscopically analysed in order to determine their taxonomic identification at the most detailed taxonomic level. Each fragment was cut and examined along three observational axes (transverse, tangential and radial) using a stereoscopic Carl Zeiss SteREO Discovery.V20 microscope with magnifications of up to

79 Among others: Rosen 2003; Babenko et al. 2007; Fuks et al. 2016; Bouchaud et al. 2017; Dunseth et al. 2019; Fuks et al. 2020; Langgut et al. 2020.

80 Asouti – Hather 2001.

360× under oblique-angled top-lighting. A Scanning Electron Microscope (SEM: JOEL JSM-6300) was used when a higher magnification was required. The abundance, arrangement and size of the wood's anatomical structures (e. g., annual growth rings, vessels, rays, fibers), along with several other diagnostic characteristics of the Eastern Mediterranean arboreal flora, were noted and compared with the modern reference collection of charred wood and tissue structure of the southern Levant (provided by the Steinhardt Museum of Natural History, Tel Aviv University) and with specialized literature on plant anatomy⁸¹.

65 Of the 617 individual charred wood samples processed until now, 3.4% were unidentifiable, while the remainder belong to 30 different taxa. The results are summarized in Fig. 56 and are divided into four categories: (i) Trees or shrubs typical to the desert environment (73.1%), (ii) Fruit trees (16.1%), (iii) Mediterranean plants and monocods (5.7%), and (iv) Exotic trees (1.9%). The assemblage is dominated by the first category – the desert plants, in particular species of *Tamarix* (of which at least three tamarisk species were identified: *T. aphylla*, *T. nilotica*, and possibly *T. parviflora*), which altogether make up more than 40% of the total assemblage. This is followed by *Retama raetam* (white broom) with 15.9%. Besides these, there is a large array of other desert shrubs and bushes like *Capparis spinose* (caper bush) and *Artemisia* sp. (sagebrush) as well as trees such as *Ziziphus spina-christi* (Christ's thorn jujube). Most of these are represented in low numbers and few make up more than 1.5% of the assemblage. Some softwoods (conifers) were identified in low numbers, including *Cupressus sempervirens* (Italian cypress, 2.1%), *Pinus halepensis* (Aleppo pine, 2.9%), and the non-indigenous *Cedrus libani* (cedar of Lebanon, 1.5%), each making about 2% of the total assemblage. Fruit trees include *Vitis* (grape, 5.9%), some *Olea* (= olive, 2.4%), *Ficus carica* (fig, 2.9%), *F. sycomorus* (sycamore fig, 0.3%), *Phoenix* (date palm 1.0%), and *Hyphena thebaica* (doum palm, 3.6%). Interesting to note is that a single sample of the imported tree, *Buxus sempervirens* (boxwood) as well as a sample of the non-indigenous medicinal and culinary herb – *Rosmarinus officinalis* (rosemary), were identified. It is also worth mentioning that a good portion of this assemblage was comprised of young or small trees.

Palynological Evidence from Plaster Samples

66 Samples for palynological investigation were collected with sterile equipment from plaster attached to walls dating mainly from the Byzantine period. The basic assumption in this approach is that air-borne pollen could be trapped in wet plaster during its application, or could have penetrated to the plaster via the local water used to mix the plaster⁸². However, so far in Elusa, only samples from interior walls are available where pollen input is reduced. A specific preparation procedure was developed for the physical-chemical pollen extraction⁸³. A light microscope with magnifications of 200x, 400x and 1,000x (immersion oil) was used for identifying the pollen grains. In each sample, all the extracted pollen grains were counted and identified. For pollen identification, a comparative reference collection of the Israeli pollen flora of Tel Aviv University (deposited in the Steinhardt Natural History Museum) was used, in addition to regional pollen atlases⁸⁴. As a result, only a few pollen grains were recovered from the three plaster samples which have been analysed. The assemblage was composed of local desert plants as well as some plants that may be related to agricultural activities such as cereals and *Phoenix dactylifera* (date palm). Among the local desert plants, the

81 Among others: Fahn et al. 1986; Wheeler et al. 1989; Schweingruber 1990; Akkemik – Yaman 2012; Crivellaro – Schweingruber 2013.

82 Langgut et al. 2013; Langgut et al. 2015b.

83 Langgut et al. 2013.

84 E. g. Reille 1995; Reille 1998; Reille 1999; Beug 2004.

Category	Taxon	Absolute number	%
Desert trees and shrubs	<i>Tamarix</i> spp. (tamarisk)	130	21.1
	<i>Tamarix aphylla</i> (tamarisk)	106	17.2
	<i>Tamarix nilotica</i> (tamarisk)	24	3.9
	<i>Tamarix parviflora</i> (tamarisk)	1	0.2
	<i>Lycium</i> spp. (boxthorn)	7	1.1
	<i>Retama raetam</i> (white broom)	98	15.9
	<i>Salsola vermiculata</i> (Mediterranean saltwort)	5	0.8
	<i>Salsola tetandra</i> (saltwort [tetandra])	4	0.7
	<i>Artemisia monosperma</i>	36	5.8
	<i>Artemisia</i> spp. (sagebrush)	8	1.3
	<i>Ziziphus spina-christi</i> (Christ's thorn jujube)	2	0.3
	<i>Capparis spinosa</i> (caper bush)	9	1.5
	<i>Calligonum comosum</i>	12	1.9
	<i>Nitraria retusa</i>	1	0.2
	<i>Ochradenus baccatus</i>	5	0.8
	<i>Thymelaea hirsute</i> (shaggy sparrow-wort)	1	0.2
	<i>Zilla spinosa</i>	1	0.2
	Subtotal	450	73,1
Fruit trees	<i>Vitis vinifera</i> (grapevine)	36	5.9
	<i>Ficus carica</i> (common fig)	18	2.9
	<i>Hyphane thebaica</i> (doum palm)	22	3.6
	<i>Olea europaea</i> (olive)	15	2.4
	<i>Ficus sycomorus</i> (Sycamore fig)	2	0.3
	<i>Phoenix dactylifera</i> (date palm)	6	1.0
	Subtotal	99	16,1
Mediterranean trees Shrubs and monocods	<i>Pinus halepensis</i> (Aleppo pine)	18	2.9
	<i>Cupressus sempervirens</i> (Italian cypress)	13	2.1
	<i>Arundo donax</i> (giant cane)	1	0.2
	Monocot plants	4	0.5
	Subtotal	36	5,7
Exotic trees	<i>Cedrus libani</i> (cedar of Lebanon)	9	1.5
	<i>Rosmarinus officinalis</i> (rosemary)	1	0.2
	<i>Buxus sempervirens</i> (boxwood)	1	0.2
	Subtotal	11	1,9
	Undetectable	21	3.4
TOTAL		617	100

56

majority formed members of *Chenopodiaceae* (beets family) and *Asteraceae* (composite family). While the latter bloom from March to May, date palms flower in April and May, giving an approximate time frame for plastering the rooms.

Fig. 56: Elusa (Haluzza). Identified charred material in absolute numbers and percentages

Conclusion

⁶⁷ During the Byzantine period, a flourishing agricultural community existed at Elusa. The exceptional success of this settlement is expressed by the abundant pollen and charred-wood assemblages: (i) The diverse fruit-tree horticulture included trees such as fig, olive, date palm and grape as well as cereal cultivation; (ii) importation or cultivation by irrigation of Mediterranean conifer trees – pine and cypress; (iii) The importation of luxurious wood or wooden artefacts made of boxwood and cedar of Lebanon point to long-distance trade connections. Rosemary, which is non-indigenous and was well known for its medicinal and culinary properties, was also identified. The flourishing of Byzantine settlements at the harsh Negev desert based on the botanical evidence was also recently demonstrated at Shivta and Nessana⁸⁵.

⁶⁸ Regarding the overexploitation of the natural vegetation – it seems that the demand for heating material, both in private households and in the public baths, was met primarily from the local and regional environment of the town, characterized by desert elements as evident by both pollen and charcoal remains. It is surprising that the desert flora, despite the intensive agricultural use of the surrounding area, was still able to provide sufficient supplies until the Late Byzantine period to ensure the functioning of such heat-intensive facilities as the large baths. The presence of relatively high frequencies of young or small trees among the charred-wood assemblages, may also be an indicator to the stress exerted by the city on the landscape.

D. L.

Faunal Remains

⁶⁹ In the framework of the excavations, a small but significant faunal assemblage has been retrieved. Livestock management, choice of food, its procurement either from local or imported sources, as well as its final preparation are strongly related to social identity. In order to shed light on these aspects of daily life in Elusa, an intensive archaeozoological analysis, including the identification of species, skeletal element and age, together with the investigation of human and carnivore produced traces, was carried out. The study took place at the Zinman Institute of Archaeology at the University of Haifa. The preliminary results of the investigation are presented here.

⁷⁰ A total of n=1227 mammal, bird and reptile remains, n=368 fish bones and n=204 mollusc shells have been determined up to the highest taxonomic unit possible. The bones of the assemblage show a high degree of preservation and a low frequency of surface modifications such as carnivore damage, fire impact or root-etching. The majority of the bones presented here was retrieved from street horizons within the settlement area of Elusa. Until the mid-5th c. C.E., the streets of the settlement were repeatedly renewed by combining a mixture of waste, which included bones, botanical remains, glass and pottery (see above). The good state of preservation of the bones likely indicates a fast deposition process and a short exposure time to the impacts of street life in Elusa.

Livestock

⁷¹ In all settlement horizons – Roman, Byzantine and Early Islamic – the study revealed an overall dominance of sheep and goats characteristic for faunal records from arid regions (Fig. 57). The Roman and Early Byzantine horizons indicate an almost mixed herding of both species, with a slight tendency towards sheep (Roman: 64%, n=23; Byzantine: 55%, n=95). However, the Early Islamic horizon showed a ma-

Taxon	Hellenistic		Roman		Byzantine		LB/EI		Early Islamic		Total NISP
	NISP	%	NISP	%	NISP	%	NISP	%	NISP	%	
Sheep	1	20	23	8	95	13	1	1	1	3	166
Goat			13	5	78	11	10	13	5	17	140
Sheep/Goat	2	40	128	47	338	47	47	59	14	48	529
Cattle			6	2	49	7	1	1			56
Pig			33	12	32	5	1	1	3	10	69
Camel	1	20	7	3	6	1					14
Equid			5	2	22	3	2	2			29
Chicken			29	11	45	6	12	15	3	10	131
Pigeon			2	*	5	1	1	1	1	3	14
Dog			4	1	1	*					5
Cat			1	*	4	1					5
Addax					1	*					1
Persian fallow deer			1	*	8	1					9
Gazelle			12	4	17	2	2	3			31
Wild boar			3	1	3	*					6
Hippopotamus					1	*					1
Wolf			1	*							1
Fox			2	*	1	*					3
Hyena			1	*							1
Bird			1	*	2	*	1	1	1	3	5
Ostrich					7	1	1	1	1	3	9
Turtle					1	*					1
Crocodile			1	*							1
Total NISP	4		273		716		79		29		1227

Fig. 57: Elusa (Haluz). Faunal remains, number of identified specimens (NISP) for mammals, birds and reptiles. LB/EI = Mixed Late Byzantine and Early Islamic; * = less than one percent

57

jority of goats (83%, n=5) compared to sheep. A similar dominance of sheep over goats in the Late Roman and Early Byzantine periods is also visible in the investigations of faunal remains from Avdat, while more goats were found in the Late Byzantine garbage mounds of Shivta, Nessana and Elusa⁸⁶. Goats are more resistant to disease, drought, water shortage and high temperatures and are able to find fodder even on degraded soils. Therefore, a mixed flock with a high proportion of goats reduces the risk of a total loss of livestock. Furthermore, the degree of natural resources such as water and land, but also human labour that has to be invested in animal husbandry is minimised and can be transferred to plant cultivation, which is of great advantage in a society specialising in agricultural yields, as suspected for the Negev during the Byzantine period.

⁷² The majority of sheep and goats in Elusa was slaughtered as adults (>70% for all studied periods). This suggests a primary use of their milk, hair and wool. Other livestock such as pigs and cattle, which are less well adapted to arid environments than sheep and goats, occur in smaller portions. However, it is striking that the percentage of pigs in Roman times is much higher (12%, n=33) than in the Byzantine (5%, n=32) and Early Islamic periods (10%, n=3). This fact might be explained by cultural preferences during that period. However, the keeping of pigs in a desert settlement is associated with an enormous investment of water due to the high requirements of the animals. That young piglets were distributed to soldiers deployed in the Negev region

as a source of meat is indicated by a document (*P.Colt* 133) of the Nessana Papyri⁸⁷. Here fifteen pounds of piglets are given to a soldier together with barley and two birds. Unfortunately, there is no hint to whether the animals were still alive or had already been slaughtered. Therefore, the question of whether the animals could have been supplied in Elusa by means of locally available water resources (e. g. wells and cisterns) or whether their meat was imported into the Negev from more temperate areas needs further investigation. In the Byzantine period the proportion of pigs in the overall assemblage decreases. A change in cultural or religious practices associated with the introduction of Christianity, including sanctions of the consumption of pork and meat in general, could be suggested as an explanation⁸⁸. However, pork obviously did not experience a complete banishment from the menu since it is still represented in the faunal record. Chicken make up a large part of the faunal remains for the Roman settlement period of Elusa (11%, n=29), but also remain important during the Byzantine period (6 %, n=45).

73 The proportion of cattle remains increases in the Byzantine assemblage (7%, n=49) compared to the Roman period (2%, n=6). Cattle husbandry, just like the keeping of pigs, poses the particular challenge that the animals have high water requirements, which must be organised and met especially in desert environments. On the one hand, it is likely that the intensified agriculture during Byzantine times required cattle as working animals and therefore the high investments in the animals that had to be made were accepted as a side effect. On the other hand, the absence of pathologies that are characteristic of animals that suffered under high workloads and which are known from faunal assemblages of archaeological sites in northern Israel⁸⁹, indicates that the animals were probably not involved in agricultural activities or transport. However, just as the nature of their use, the question of whether cattle were kept in Elusa and supplied with locally available resources needs closer examination. Although in low quantities, horses and camels are also present in the faunal record. The fact that the latter were used in the caravan trade (*P.Colt* 89)⁹⁰ and for warfare (*P.Colt* 35; *P.Colt* 37)⁹¹ during Byzantine and Early Islamic times is well-documented in the papyrus corpus from Nessana. The small number of camel and horse bones is possibly connected to their minor or more likely non-existent role in the diet of the inhabitants and explains why they did not end up in the waste of the settlement. Similar observations could be made in the faunal assemblage recovered from the garbage dumps of Elusa, which hardly contained any remains of these animals⁹². As animals for transport or the military, they presumably died outside the settlements.

Fish and Molluscs

74 Besides local animal husbandry, an intensive import of food can be established by the remains of – mainly edible – marine resources, indicated by fish bones (Fig. 58)⁹³ and mollusc shells (Fig. 61)⁹⁴. The taxonomic determination of the remains allowed for the identification of different zoogeographic habitats/import regions: the Red Sea, the Mediterranean Sea, the Nile River and possibly other freshwater bodies such as

87 Kraemer 1958, 317 f.

88 Marom et al. 2019, 2; Grumett – Muers 2010, 72–87.

89 E. g. the Horvat Castra faunal record, studied by the author, includes high amounts of distorted cattle phalanges.

90 Kraemer 1958, 251–260.

91 Kraemer 1958, 108–110 and 114–117 respectively.

92 Marom et al. 2019, 5.

93 The analysis of the fishbones must still be regarded as incomplete. Further results on the yet unidentified bones are to come.

94 An exhaustive presentation and discussion of the molluscan remains from Elusa has been published by Ktalav et al. 2021, 102927 and Lehnig et al. 2021.

Taxon	Common Name	Habitat	Roman		Byzantine		LB/EI		Early Islamic		TOTAL
			NISP	%	NISP	%	NISP	%	NISP	%	
<i>Lates niloticus</i>	Nile perche	Nile River			4	3	1	1			5
<i>Chondrichthyes</i>	Sharks, rays	Mediterranean, Red Sea			6	4	1	1			7
<i>Cichlidae</i>	Cichlid	Freshwater			2	1	13	8	5	19	20
<i>Clariidae</i>	Catfish	Freshwater					1	1			1
<i>Cyprinidae</i>	Carp	Freshwater			1	*					1
<i>Mugilidae</i>	Mullet	Freshwater, Mediterranean			3	2			1	4	4
<i>Scaridae</i>	Parrotfish	Mediterranean, Red Sea			21	13	29	17	18	67	68
<i>Serranidae</i>	Grouper	Mediterranean, Red Sea			8	5	1	1			9
<i>Sparus aurata</i>	Gilt-head bream	Mediterranean			2	1			1	4	3
<i>Pisces</i>			15	100	112	70	121	72	2	8	250
Total NISP			15		159		167		27		368

58



59

Fig. 58: Elusa (Haluzá). Faunal remains, number of identified specimens (NISP) for fish. LB/EI = Mixed Late Byzantine and Early Islamic; * = less than one percent

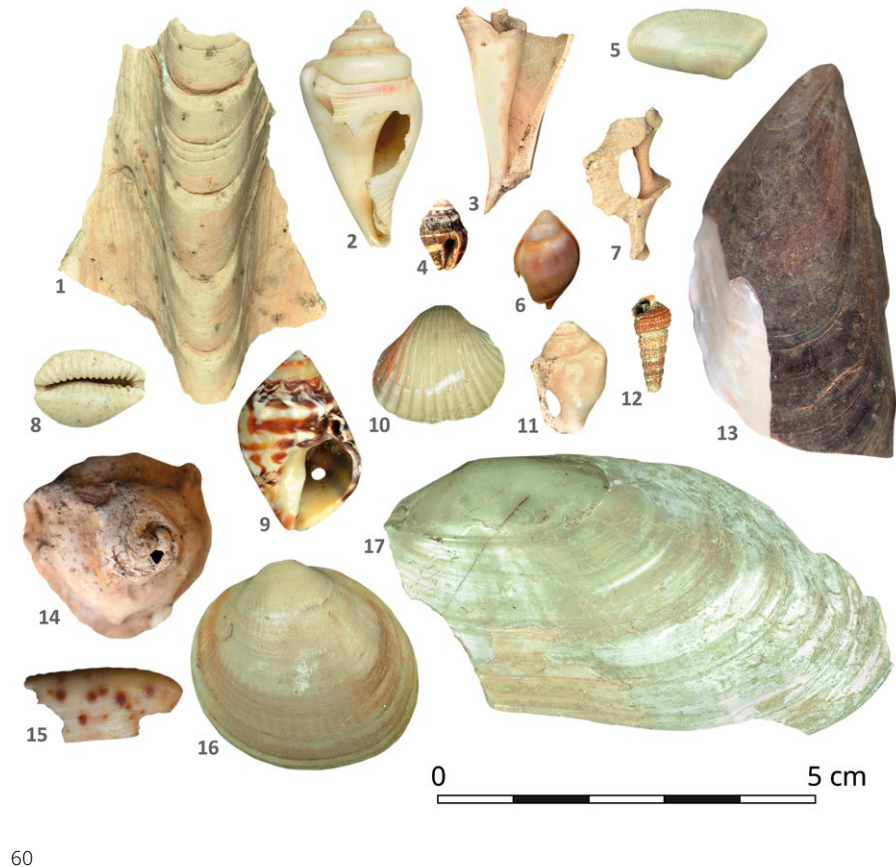
Fig. 59: Pharyngeal jaws of the parrotfish, showing that it was transported to Elusa as a whole with its head preserved

the Jordan River or the Sea of Galilee. These different habitats indicate access to a variety of different fish markets, which is also indicated by the various biological characteristics of the animals (demersal and pelagic, solitary and shoal-building, diurnal and nocturnal fish families are represented), which require a broad range of fishing techniques. The species richness is highest during the Byzantine period. The diversity of different fish imported into the Negev Desert during these centuries is reflected even more in the fish remains of other sites⁹⁵. As all parts of the skeleton are present, including the head (characteristic are the pharyngeal bones of the parrot fish; Fig. 59), it can be assumed that many fish were brought to Elusa complete. The Nessana Papyri indicate that fish was imported into the Negev both dried (*P.Colt* 49) and processed into *garum* (*P.Colt* 87)⁹⁶. The various fish products were transported to their final destination via the caravan trade. Based on the evidence from the papyri, the transport was not conducted by specialised traders, but fish was one of many products purchased and sold by the caravans (*P.Colt*

95 Blevis et al. 2021, 102808; van Neer et al. 2004, 101–147; Lernau 2004, 335–349; Lernau 1995, 99–111; Lernau 1986, 85–102.

96 Kraemer 1958, 143 and 149 respectively.

Fig. 60: Overview of the shells and shell fragments of marine and freshwater species identified in the settlement area of Elusa, 1: *Tridacna squamosina*; 2: *Conomurex decorus*; 3: *Lambis* sp.; 4: *Engina mendicaria*; 5: *Donax trunculus*; 6: *Cerithideopsisilla conica*; 7: *Murex* sp.; 8: *Naria spurca*; 9: *Nerita* sp.; 10: *Cerastoderma glaucum*; 11: *Euplica varians*; 12: *Nassarius circumcinctus*; 13: *Mytilus galloprovincialis*; 14: *Bolinus brandaris*; 15: *Cypraea pantherina*; 16: *Glycymeris nummaria*; 17: *Chambardia rubens*



89)⁹⁷. The papyri mention camels, donkeys, slaves, wine, honey and iron as commodities in the account of the group, while fish seems to be rather a by-product in their bigger business. The traders in papyrus 49 are more likely to represent specialised fish traders since it is the only ware mentioned in connection to their business. The shellfish found in Elusa (Fig. 60, 61), were harvested or collected in the same zoogeographic habitats where the fish were caught. Their transport to various settlements of the Negev Desert is further attested by malacological reports from other archaeological investigations⁹⁸. Only a few shells show perforations or signs of polish indicating their use as adornment, raw material or souvenirs (<1%). Most frequently represented during the Roman (57%, n=21) and Byzantine periods (33%, n=36) is the small Mediterranean clam *Donax trunculus* (Fig. 60, 5). Measurements of their shells show that both juvenile and adult individuals are represented. The mean size (expressed by the maximal length) of the *Donax trunculus* shells ranged from 16.5 to 32.5 mm. With 80%, juvenile individuals form the majority, while adult shells (>30.52 mm) are underrepresented. In some populations of *Donax trunculus*, depth segregation could be observed, meaning that juvenile individuals are often found in shallower waters, while adults inhabit greater depths⁹⁹. This information together with the size measurements taken for the individuals found in Elusa, could be a hint to where the collection of the animals took place. A dominance of juvenile individuals in the present mollusc sample points to a concentration of fishing activity in shallower waters close to the coast. During the Byzantine (8%, n=9) and Early Islamic period (65%, n=15), the import of the Nile River bivalve *Chambardia rubens* (Fig. 60, 17), which is not found in Roman contexts, can be observed. Whereas other

97 Kraemer 1958, 251–260.

98 E. g. Ktalav et al. 2021, 102927; Perry et al. 2013, 321–380; Cartwright 2012, 525–533; Mienis 2004, 165–196; Reese 1995, 97 f.; Jackson 1962, 67–69.

99 Anjos 2016, 9.

Habitat	Taxon	Roman		Byzantine		Mixed Late Byzantine/ Early Islamic		Early Islamic		TOTAL	
		NISP	%	NISP	%	NISP	%	NISP	%	NISP	%
Mediterranean	<i>Bolinus brandaris</i>			1	1					1	*
	<i>Cerastoderma glaucum</i>	5	13	17	16	2	6			24	12
	<i>Donax trunculus</i>	21	57	36	33	12	34	4	17	73	36
	<i>Naria spurca</i>			5	5					5	2
	<i>Glycymeris nummaria</i>	6	16	30	28	3	9	3	13	42	21
	<i>Mytilus galloprovincialis</i>			2	2					2	1
	<i>Nassarius circumcinctus</i>			1	1					1	*
	<i>Ostrea sp.</i>	1	3							1	*
	<i>Pirenella conica</i>	1	3	1	1					2	1
Red Sea	<i>Cypraea pantherina</i>			1	1					1	*
	<i>Engina mendicaria</i>			1	1			1	4	2	1
	<i>Euplica varians</i>			1	1					1	*
	<i>Lambis sp.</i>			1	1	2	6			3	1
	<i>Murex sp.</i>					1	3			1	*
	<i>Nerita sp.</i>	2								2	1
	<i>Conomurex decorus</i>	1								1	*
	<i>Tridacna squamosina</i>			3	3					3	1
Nile River	<i>Chambardia rubens</i>			9	8	15	43	15	65	39	19
	Total	37		109		35		23		204	

61

molluscs nearly disappear from the record during the Early Islamic period, the import of the shell remained stable. Apart from that, it is noticeable that the variety of species in general strongly decreases during the Early Islamic settlement period (Fig. 57). Only sheep and goat husbandry remains and the import of a few mollusc species and fish seems to continue.

Fig. 61: Elusa (Haluzia). Faunal remains, number of identified specimens (NISP) for marine and freshwater bivalves and gastropods. LB/EI = Mixed Late Byzantine and Early Islamic; * = less than one percent

Game

75 Wild animals in the Elusa assemblage mainly include gazelles (Fig. 57). The ungulates still inhabit almost the entire region today¹⁰⁰. Also, remains of Persian fallow deer, Addax and wild boar could be identified. Ostrich could be recognised through the remains of its eggshells. However, bones of the animal were not recovered. Just like a diversity of other large-bodied species, the ostrich disappeared from the research area during the 19th and 20th c. due to uncontrolled hunting and habitat destruction¹⁰¹.

76 Remains of other taxa in the Elusa assemblage include a crocodile osteoderm – the bony deposits that form scales and plates – and a hippopotamus lower canine. Whether the animals were brought to Elusa for consumption or other purposes remains unclear. Although elephant ivory was preferred in antiquity for the production of tools or other items, the incisors and lower canines of the hippopotamus provide enough

100 Amr et al. 2004, 458.

101 Tsahar et al. 2009, 12.

ivory and were used for working as well¹⁰². Finds of bone carvings from Elusa and other Negev settlements led researchers to assume that there could have been a local workshop¹⁰³. In this context, the hippopotamus tooth could have found its way to Elusa as raw material. Other finds of hippopotamus bones that would allow for more precise statements on the use of the animal are still missing in the Negev area. The same applies to crocodile bones in the region. The dermal plate from Elusa and a second find from Shivta represent the only evidence so far¹⁰⁴.

Conclusions

77 The analysis has shown that animal husbandry in the Negev in the Roman to Early Islamic periods focused primarily on sheep and goats, as it is characteristic of arid regions. While both species occur in roughly equal proportions in the Roman and Byzantine periods, the focus shifted to goat husbandry in the Early Islamic period. Elusa was also supplied with pork, especially during the Roman occupation phase. It is still unclear whether this can be attributed to the local animal husbandry of pigs or the import of dried portions of meat. Animals such as the camel and the horse were probably used in military and transport activities and were not important as meat suppliers. The identification of various wild animals that still occur in the region today – such as the gazelle – shows that local animal resources were used as well. The numerous marine and fluvial molluscs and fish, but also the finds of a crocodile osteoderm and a hippopotamus canine, impressively demonstrate how intensively Elusa was connected with distant regions such as the Mediterranean, Egypt and the Red Sea. At least for the fish and some molluscs, it could be established that they formed a part of the diet and came to the city either fresh, dried or salted. The animal remains thus show that Elusa, despite its location on the edge of the Roman Empire, was closely integrated into the trade network of the time. The inhabitants practised a mixture of adaptation to the arid climate of their hometown – for example, by keeping sheep and goats, and hunting local wild animals – but at the same time their eating habits were also oriented towards Mediterranean traditions.

S. L.

Summary

78 From 2015 on, Elusa's multi-disciplinary investigation has generated a wide range of information regarding the structure and development of Elusa. The results of the magnetometer survey allow a detailed reconstruction of the urban layout showing the network of streets and many individual buildings. The archaeological survey, in turn, allowed the identification of certain types of buildings, such as churches and the location of economic activities. Finally, the stratigraphic soundings carried out yielded detailed chronological information on the long-term development of the settlement. The urban organization and equipment of the city with public buildings seems to reflect a mixture of Mediterranean influences as well as regional traditions. This hybrid character of the settlement also becomes visible in the domestic buildings: peristyle houses of Hellenistic-Roman tradition appear simultaneously to regional courtyard and tower houses. The following can be said to summarize Elusa's development: the location was frequented since the 3rd/2nd c. B.C.E. as indicated by Nabatean pottery finds and radio-carbon-dated charcoal remains from different contexts. The nucleus of the city can be

102 Stern – Thimme 2007; St. Clair 2003, 5.

103 Goldfus – Bowes 2000, 185–202.

104 Marom et al. 2019.

assumed to be in the western part, but so far, no structural remains can be associated with this phase. After a clear hiatus in the 1st c. B.C.E. for which no archaeological evidence exists, a remarkably dynamic urbanization process started between the 1st and early 3rd c. C.E. In this period, the city grew rapidly to its maximum extent, soon covering an area of nearly 45 hectares of the Late Antique city. The network of streets seems to have already been largely consolidated in this early phase. The streets were flanked by domestic and public buildings, often built with mudbrick walls. The theatre and the huge bath complex – both the largest known examples of their kind in the Negev region – were built during this period, clearly reflecting the urban character of the city in the Mid-Roman period as well as the strong influence of the Roman-Mediterranean urban culture. On the other hand, characteristic features such as a central public square in the form of a forum/agera with corresponding public buildings and functions are missing. Interestingly, they are substituted by peripheral open spaces, which presumably had primarily economic purposes. Evidence for settlement activities during the later 3rd c. C.E. is scarce, perhaps reflecting the contemporaneous decline of Nabatean trade and several periods of droughts¹⁰⁵.

79 A second phase of prosperity was closely connected to the successful agricultural use of the Negev in late antiquity. During the 4th and 5th c. C.E., most parts of the city were renewed on a level about 1.5–2.0 m above that of the Early/Mid-Roman phases. Mudbrick structures were systematically levelled and replaced by stone buildings with high quality masonry. At least eight churches were built, one of them possibly a bishop's church and another as part of a possible monastery. These churches were often embellished with high quality decoration in their second phase. In the centre of the city, a huge peristyle building was constructed which was probably used as a kind of *emporium*. The baths were continuously in use and were also further embellished. The periodical renewal of the street surfaces made with superimposed layers of compressed limestone-chippings, which started in the first 1st c. C.E., was replaced around 450 C.E. with a city-wide high-quality stone pavement. This also enabled the large-scale collection of rainwater and its supply to public cisterns. Numerous buildings now appear to have additional porticos in front of their facades, and a continuous colonnaded street is emerged in the centre of the city. Furthermore, in some parts of the city, an elaborate sewer-system managed the wastewater. Many buildings of this period show traces of repeated large-scale destructions and restorations, probably caused by earthquake damages. Remarkably, the theatre was also lavishly renovated in 454/455 C.E. thanks to a private donation¹⁰⁶. The quick reconstruction on the same foundations demonstrates a high resilience and prosperity of the city during this period. This is also indicated by the quality of the masonry in Elusa, for example in the Late Antique tower houses, as well as in the outstanding decoration of the churches. Vault-mosaics with glass tesserae (some of which feature gold leaf) decorated the churches; their floors were paved with mosaics and *opus sectile* in differently coloured marble. The emergence of the huge waste mounds all around the city demonstrates an efficiently organized garbage disposal and documents a high sense of community and administration. During the first half of the 6th c. C.E., the urban dynamics seem to slow down: building activities are now restricted to renovations of already existing structures.

80 The material analyses carried out provide further facets of this apparent phase of prosperity in the early and mid-Byzantine periods. For example, the archaeobotanical investigations document a broad spectrum of crops that indicate intensive

105 For the economic decline see Erickson-Gini 2010, 51–64, concerning possible climate changes: McCormick et al. 2012, 186.

106 Negev 1983; Negev 1993a; Hackl et al. 2003, 395.

agricultural use of the surrounding countryside. High quantities of Gaza wine amphorae, apparently transported empty to Elusa by the caravans returning from the coastal region, confirm that the city – like the other sites of the Negev Highlands – participated intensively in the production and export of wine. At the same time, rare, non-endemic types of wood, probably originating from furniture or small objects, as well as a wide range of imported fish and molluscs prove that Elusa was integrated into a broad trade network in the early and mid-Byzantine period, which reached as far as the Red Sea, Egypt and the Mediterranean. At the same time, the semi-arid desert fringes were used for traditional, presumably semi-nomadic sheep and goat breeding and for hunting gazelles. The diversity and intensity of the agricultural use of the surrounding area must have exerted a high impact and stress on the natural habitat and the available resources. An example is the considerable scarcity of wood for fuel as suggested by the archaeobotanical research, leading to animal dung being apparently used for the daily needs of most households, while the baths were heated with wood – but even there only young trees and bushes were available.

⁸¹ However, starting in the second half of the 6th c. C.E. and continuing into the 7th c. C.E., clear signs of crisis and a gradual urban decline are evident: buildings, including the theatre and the baths, were abandoned or robbed of their decorations and building materials. Often, the entrances to buildings were blocked up. The systematic waste management of the previous period is replaced by local waste dumps in the neighbourhoods and streets. All over the settlement, repairs and conversions of the existing buildings can be observed, some buildings threatening to collapse are secured with retaining walls. A considerable transformation process seems to reshape the settlement's character well before the Arab conquest took place¹⁰⁷. During the conquest, many buildings were already abandoned, while in some parts of the city, settlement activities continued through the 7th c. C.E. Various public buildings like the churches, the peristyle building, the baths as well as some private houses, were purposefully robbed of architectural elements and décor during this period. Only a few new buildings were constructed, often by using spolia, and frequently in the middle of former streets. Particularly noteworthy is that agricultural activities were now conducted inside the boundaries of the former city, as is indicated by wine or oil presses found in two areas. However, it seems questionable as to whether the quantities produced here were still intended for export. The massive decrease of the number of sherds of Gaza wine amphorae from about the mid-6th c. C.E. onwards points to a profound change in the local economy and a marked decline in the exchange of goods. Several factors, whose individual impact require further discussion, may have contributed to this fundamental transformation, including the outbreak of the Justinian plague, the increasing weakness of state structures and growing threats to the external borders, a loss of sales markets, climatic fluctuations or a possible overexploitation of natural resources. All these aspects require further evaluation in future discussions. While the excavation evidence confirms a clearly detectable, though greatly reduced settlement activities in the Umayyad period, only sporadic finds are attested for the early Abbasid period, indicating a final abandonment of the city after the mid of the 8th c. C.E.

M. H. – C. A. S.

¹⁰⁷ These observations reflect to a certain extent Avni 2014, 289 f., who basically sees an uninterrupted continuity from the Byzantine to the Islamic period.

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AUTHOR DETAILS

Prof. Dr. Michael Heinzelmann
Archäologisches Institut, Universität zu Köln
Albertus Magnus Platz
50923 Köln
Germany
michael.heinzelmann@uni-koeln.de
ORCID iD: <https://orcid.org/0000-0002-7965-1652>
ROR ID: <https://ror.org/00rcxh774>

Christian A. Schöne M.A.
Archäologisches Institut, Universität zu Köln
Albertus Magnus Platz
50923 Köln
Germany
c.a.schoene@uni-koeln.de
ORCID iD: <https://orcid.org/0000-0002-1858-9883>
ROR ID: <https://ror.org/00rcxh774>

Arne Schröder B.A.
Archäologisches Institut, Universität zu Köln
Albertus Magnus Platz
50923 Köln
Germany
arne.rene.schroeder@uni-koeln.de
ORCID iD: <https://orcid.org/0000-0003-1378-0424>
ROR ID: <https://ror.org/00rcxh774>

Diana Wozniok M.A.
Archäologisches Institut, Universität zu Köln
Albertus Magnus Platz
50923 Köln
Germany
dianawozniok@hotmail.de
ORCID iD: <https://orcid.org/0000-0003-1900-2551>
ROR ID: <https://ror.org/00rcxh774>

Florian Jordan M.A.
Abteilung Christliche Archäologie, Universität
Bonn
Regina-Pacis-Weg 1
53113 Bonn
Germany
fjordan@uni-bonn.de
ORCID iD: <https://orcid.org/0000-0003-0832-1725>
ROR ID: <https://ror.org/041nas322>

Dr. Tali Erickson-Gini
Israel Antiquities Authority
Southern Region
P.O. Box 271
84965 Omer
Israel
talixgini@gmail.com
ORCID iD: <https://orcid.org/0000-0003-2902-3831>
ROR ID: <https://ror.org/037fbyh64>

Dr. Marlu Kühn
Integrative Prähistorische und
Naturwissenschaftliche Archäologie (IPNA),
Universität Basel
Spalenring 145
4055 Basel
Switzerland
marlu.kuehn@unibas.ch
ORCID iD: <https://orcid.org/0000-0003-0310-3892>
ROR ID: <https://ror.org/02s6k3f65>

Dr. Dafna Langgut
Department of Archaeology and Ancient Near
Eastern Cultures, Laboratory of Archaeobotany
and Ancient Environments
Tel Aviv University
69978 Tel Aviv
Israel
dafna.langgut@gmail.com
ORCID iD: <https://orcid.org/0000-0002-4824-1044>
ROR ID: <https://ror.org/04mhgzx49>

Dr. Sina Lehnig
Graduiertenkolleg 1876
Johannes Gutenberg-Universität Mainz
Hegelstr. 59
silehnig@uni-mainz.de
ORCID iD: <https://orcid.org/0000-0003-2064-7461>
ROR ID: <https://ror.org/023b0x485>

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