

When “the Sweet Gifts of Bacchus” Ended—New Archaeological Evidence for Settlement Changes and the Decline of Wine Production in Late Antique Southern Palestine

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Based on the accumulated data from numerous excavations in the hinterland of Gaza and Ashkelon and the results of the comprehensive bioarchaeological research on Late Antique settlement and economy of the Negev Highlands, this article addresses the decline of the flourishing wine industry of southern Palestine, dating it to the second half of the 6th century C.E. The decline in wine production in the region had a direct effect on the rapid abatement of Elusa, the main city of the Negev, and Shivta, a wealthy large village in the western Negev Highlands. Consequently, the extensive system of industrial farms that formed the hub of the flourishing wine industry declined at the same time. This article suggests connecting these events with changes in the patterns of demand, supply, and production of the “sweet gift of Bacchus,” taking into consideration regional aspects, environmental fluctuations, economic transformations, and the decline of consumption markets.

Keywords: Negev; Late Antiquity; affluence; viticulture; settlement decline; Mediterranean commerce

The 6th century C.E. is traditionally viewed as a period of high prosperity in the Levant, when population growth and settlement intensification and expansion to the desert fringe areas reached an unprecedented peak (Tsafrir 1996; Walmsley 1996; Ward-Perkins 2000; Magness 2003; Bar 2004; Wickham 2005: 442–59; Cameron 2012: 168–90). Urban and rural settlements in Syria, Jordan, and Palestine flourished under the stable political conditions of the Byzantine rule (Fig. 1). The spread of Christianity in rural areas resulted in the construction

of numerous churches in villages of the countryside, most of them in the 5th and 6th centuries. In tandem, the growth and expansion of monastic communities reached a peak in the 6th century (Bar 2003; Hirschfeld 2004b; Di Segni 2009, 2017). The results of excavations and surveys show an increased productivity of rural landscapes, based on extensive cultivation of olives, vines, and wheat, with a developed commercial activity in agricultural products. Local economies flourished, with surpluses exported out of the region (Decker 2009; Zerbini 2012; see Kingsley 2001 for summaries). The production and export of the prestigious Palestinian wines became one of the main income sources (Mayerson 1985; McCormick 2012; Lantos, Bar-Oz, and Gambash 2020). The Late Antique settlement density in southern Palestine, particularly in the hinterlands of Ashkelon and Gaza and in the Negev Highlands, shows that this was one of the most prosperous regions of Byzantine Palestine,¹

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¹ In this context the term “Byzantine Palestine” relates to the period between 324–638 C.E.

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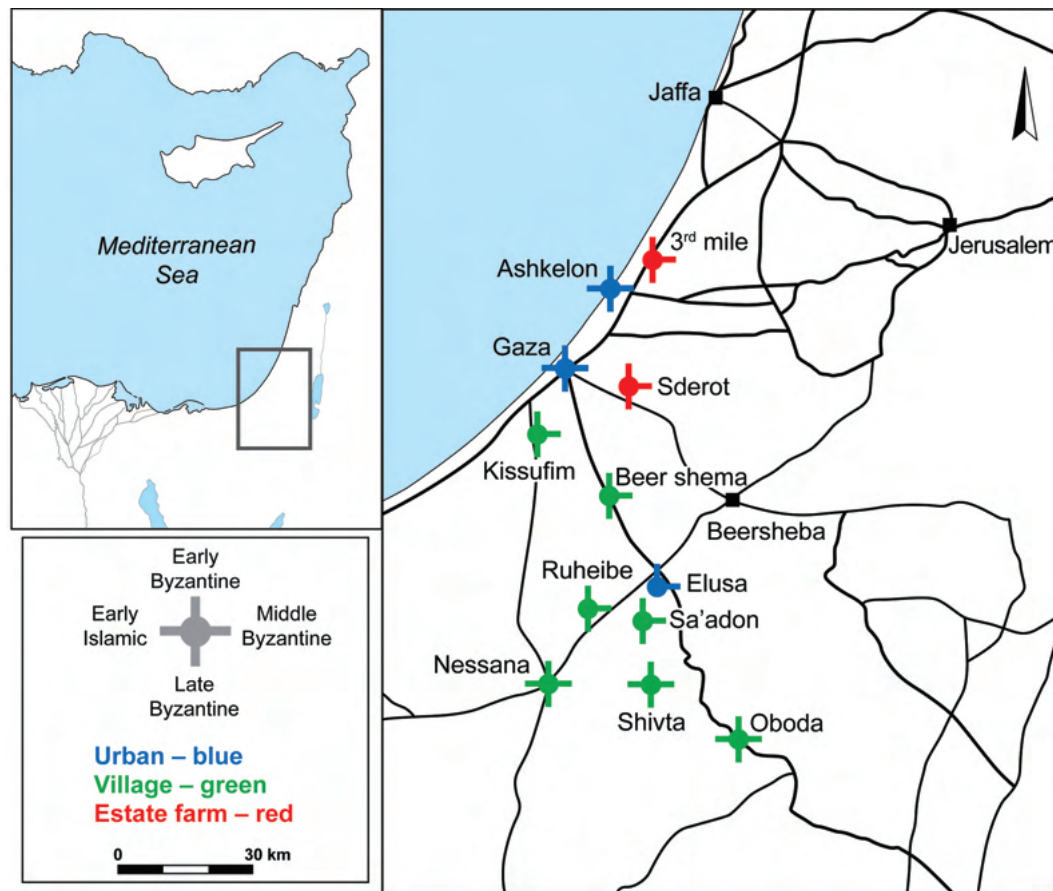


Fig. 1. Location map of sites mentioned in the text and periods of settlement. (Map by S. Haad)

with the widest spread and highest density of settlements compared to any other period in history (Tsafrir 1996; Huster 2015). This rich countryside consisted of villages, industrial farmsteads, and rural monasteries, forming a dense economic system that was based mainly on the production and export of wines. The expansion of agricultural settlements to the Negev Highlands resulted in the establishment of an extensive network of large villages, farmsteads, agricultural fields, and installations. The archaeological findings, together with the epigraphic material and the textual evidence of the Nessana and Petra papyri, point towards a constant increase in agricultural productivity (Mayerson 1960; Rubin 1990; Avni 2014: 260–74 for a summary; Fuks et al. 2020; Lantos, Bar-Oz, and Gambash 2020).

This view of settlement prosperity has been enhanced by the plethora of archaeological excavations in modern Israel, Palestine, and Jordan in the past four decades, which have provided extensive data on urban and rural settlement expansion between Roman and Early Islamic times (see, for example, Tsafrir 1996; Walmsley 1996, 2007; Ward-Perkins 2000; Magness 2003; Sivan 2008; Avni 2014; and Bar 2003, 2004 for Palestine and Jordan. See also Liebeschuetz

2001; Wickham 2005; Cameron 2012: 168–209; and Sarris 2011: 143–50 for general evaluations on settlement and society in the Late Antique Near East).

This prosperous economic system came to an end in the 7th century, and the circumstances of its decline were traditionally associated with the Persian and Arab conquests of 614 and 634 C.E. Only a handful of scholars suggested an alternative view, looking at the second half of the 6th century as the watershed between prosperity and decline (for example, Avi Yonah 1958; Fiema 2002; Morrison and Sodini 2002: 253).

This article proposes a new paradigm for the decline of settlements in southern Palestine, dating its beginning to the middle of the 6th century, and taking into consideration regional aspects, ultimately economic in nature. This paradigm is based on a synthesis of all previously acquired data, an analysis of new discoveries made in recent archaeological excavations, insights from environmental studies in the Negev Highlands, the northwestern Negev, and the southern Coastal Plain of Israel, and, finally, the broader picture of stressors coming into play during the 6th and 7th centuries in the entire Mediterranean basin.

The synthesis of such a wide and multidisciplinary array of sources represents a recent shift in historiography, becoming ever more dominant during the last few years. This new approach aims to observe environmental and natural factors in tandem with social, political, and economic systems, and to produce a more nuanced representation of ancient reality and the processes generating change in it. The analysis offered here for the rise and fall of the Byzantine Negev, realizing this holistic approach to the fullest, demonstrates clearly why reductive perspectives, highlighting isolated events of phenomena, are insufficient in explaining the lifecycle of a society.

While much of the agriculture developed in the arid Negev served for self-consistency, it is now clear that viticulture was nurtured from an early point to produce significant surpluses (Fuks, Avni, and Bar-Oz 2021; contra Seligman 2020), and the thriving Negev wine industry has been shown to have played a major part in the microregional primary-production mechanism, supplying prestigious Gaza and Ashkelon wines—referred to by Corippus (*In Laud.* 3.87–88) as “the sweet gifts of Bacchus”—to widespread Mediterranean networks, also penetrating North Africa and Europe. While the economy of Byzantine Palestine was a typical Mediterranean one, the wine industry of the Negev contributed to the prosperity of the region more than any other economic factor. However, the lack of diversification also implied extreme fragility, particularly given the challenging environment. Other agro-pastoral components of the Negev local economy, such as wheat and barley, fruits, and goat-raising, were mostly supplementary to viticulture. Sole dependence upon long-distance demand for a high-end commodity, produced in a second circle of supply further away from the coast, meant that the Negev settlements would have been the first to suffer from a slowdown in that demand, and the ones least equipped for adaptation and resilience.

It did not take a full-scale Mediterranean catastrophe, such as an influential little ice age, a brutal plague, or a “Pirennean wall” to bring all Mediterranean trade to a standstill. Recent research tends to agree that these had their effect on particular regions around the Mediterranean. Climate change *was* felt to some degree; the Justinian plague *did* have a significant negative effect, where it hit; and some consumption habits *did* change, and led in the longer term to a shrinking wine market. While more robust economies could face such a sequence through various adaptive measures, for some of the Negev leading players this set of abatements proved too harsh to survive, and the decline of the wine production in southern Palestine led to the demise of the extensive settlement system, which was based on large-scale viticulture. Towards the end of the 6th century, a significant decline in settlements is observed through the archaeological record, from the city of

Elusa (Halusa) to the town of Shivta (Soubeita), and to the extensive system of farmsteads and industrial production centers in the hinterlands of Gaza and Ashkelon.

The Negev Settlements and Viticulture in the 6th Century

Recent bioarchaeological interdisciplinary research on the decline of the Byzantine Negev (Tepper, Erickson-Gini, Farhi et al. 2018; Bar Oz et al. 2019; Marom et al. 2019; Fuks et al. 2020; Vaiglova et al. 2020) provided a significant contribution towards the understanding of local economies and settlement processes and their environmental context in the 6th and 7th centuries C.E. (Fig. 2). In contrast to traditional research that concentrated on excavations of architectural components of a site or a region, this recent research used integrated archaeological, archaeozoological, and archaeobotanical methodologies to work towards a better understanding of the economic infrastructures of the Byzantine Negev. Probing the refuse dumps of the large Negev settlements of Elusa, Shivta, and Nessana provided a reliable reconstruction of the wealth and decline of the settlements. The careful dating of the dumps and the evaluation of changes in the consumption of goods, both local and imported, opened the path for a refined evaluation of the chronology of settlement change and decline (Tepper, Erickson-Gini et al. 2018; Bar-Oz et al. 2019).

The archaeozoological record documents important evidence for substantial changes in the transition from the Byzantine to the Early Islamic period, including the cessation of pigeon-keeping and changes in the representation of livestock animals such as sheep, goats, pigs, and camels (Marom et al. 2018, 2019). A comparative analysis demonstrates that Byzantine settlements had a typical mixed Mediterranean agropastoralist economy (Figs. 3, 4), emphasizing goat husbandry. In addition, pigs were consumed in all Byzantine settlements, as would be expected of a Romanized Christian community in the region. During the Early Islamic period, Christian Nessana showed a spatially confined economy that relied on local game as well as on imported marine food and pigs. The extensive goat pastoralism in the Byzantine period may be correlated with the intensity of agricultural production in the region, marking the economic shift towards a mode of production that added value through the transportation of goods from one place to another (Gambash et al. 2019; Bar-Oz, Tepper, and Shafir 2021; Blevis et al. 2021; Ktalav et al. 2021).

Finds from excavated dump deposits also included a large variety of botanical remains, supporting the central role of sustainable resource management to the Byzantine economy (Fuks et al. 2016, 2020, 2021; Dunseth et al. 2019; Langgut et al. 2021). For example, refuse deposits contained



Fig. 2. Examples of archaeological contexts that yielded rich and comprehensive data to explore development and change of cultural economy and agricultural activities in the Byzantine Negev. Top: overview of the large trash mound of Nessana; center: the northern wine press of Shivta (left) and trash midden inside an abandoned house in Shivta (right); bottom: sealed house in Shivta (left) and pigeon tower in Sa'adon (right). (Photos by Y. Tepper and G. Bar-Oz)

a high concentration of dung-ash, indicating the widespread use of dung as a sustainable fuel (Butler et al. 2020). Similarly, palynological analysis and charcoal remains demonstrated the prosperity of Byzantine desert agriculture, evi-

denced by the presence of diverse Mediterranean fruit tree cultivars (Langgut et al. 2021). The archaeological evidence for the intensive cultivation of grapes in the Byzantine period is reinforced by the historical evidence and the



Fig. 3. Typical terraced farm near Shivta, the Negev Highlands. (Photo by G. Avni)



Fig. 4. Reconstructed terraced farm near Avdat, the Negev Highlands. (Photo by G. Avni)

Nessana papyri (Lantos, Bar-Oz, and Gambash 2020). The richness of the local agriculture may also be observed in the microfaunal remains retrieved from excavated pigeon towers in the hinterland of relevant sites, where high populations of jirds (*Meriones*) were identified (Fried et al. 2018). The environmental analysis of pigeon towers has produced large amounts of pigeon dung with abundant nesting compartments and floral food remains, further indicating their mutual relationship with the local agriculture lifestyle (Ramsay et al. 2016; Tepper et al. 2017; Tepper, Porat, and Bar-Oz 2020a). Such intensive, sustainable agricultural practices did not persist, and were largely abandoned by the end of the Byzantine period (Yan et al. 2021). The synchronous decline in agricultural activity was also evident in the trash mounds of the local settlements, abundant with the remains of fruit trees and natural vegetation charcoal, found in layers rich with raw dung (Butler et al. 2020; Langgut et al. 2021). Those remains mark the sharp change in waste management practices, highlighting the economic pressures that were involved in the agrarian heartland of the Negev toward the 7th century.

The renewed excavations at Shivta, the best-preserved Byzantine settlement in the Negev, were conducted between 2015 and 2019 (Tepper, Erickson-Gini, Farhi et al. 2018). The site, extending over an area of ca. 8 ha amidst large agricultural fields, included three apsidal churches, a small early Islamic mosque, a large central water reservoir, numerous spacious residential buildings, and several wine presses. Previous archaeological works in Shivta consisted of large-scale excavations conducted by the Colt Expedition in 1934–1938 (which unfortunately were never published), additional surveys of the standing remains, and small probes in the northern and southern churches (Segal 1983; Negev 1993; Hirschfeld 2003).

The recent fieldwork included probing 20 locations within the site, in residential buildings, in the public reservoirs and channels, in the floor of the mosque, and along the main arteries of Shivta. The research focused on the chronology of abandonment of residential buildings, on the local economy as reflected in the refuse deposits, and on the mechanisms of water management in the large public pools within the settlement and in its agricultural hinterland (Tepper, Weissbrod, Fried et al. 2018; Tepper, Porat, and Bar-Oz 2020). Particularly interesting was the systematic sampling of the trash dump deposits both inside and outside of the settlement, which provided rich organic materials and enabled a differentiation between the Byzantine and the Early Islamic trash concentrations (Tepper, Erickson-Gini, Farhi et al. 2018: 122–24).

Trash dump deposits provide an especially useful source of data for investigating the complex life history of settlements. These dense concentrations of cultural remains are a particularly rich source of data by which to extract valuable

information regarding daily life and are a highly reliable and direct proxy of human behavior (Rathje and Murphy 1992). This is particularly important in the historical periods when large-scale formal landfills characterized waste management of long-lived communities of complex societies. Large trash mounds resulting from long-term, organized garbage dumping mirror waste management preferences of complex societies with systematized bureaucracies and political institutions. Such dense cultural deposits have rarely been systematically researched in the southern Levant (but see Bar-Oz et al. 2007; Tal, Taxel, and Jackson-Tal 2013; Taxel 2018: 135–43), nor in most other world regions where they have been anecdotally documented (e.g., Barker 1996: 38). Trash mounds that survived in an incredibly intact form in the dry environment of the Negev around and inside the Byzantine towns provide the ideal target for such intensive bioarchaeological projects. These dumps provide prime archaeological contexts with continuous and superimposed records to track a wide range of economic activities such as subsistence, trade, and climate change.

One of the main contributions of the recent fieldwork lies in the refined observations on the chronology of change and decline of the settlement. The latest pottery found on the floors of the domestic buildings in Shivta indicate that they were deliberately abandoned sometime in the second half of the 6th or in the early 7th century (Tepper, Erickson-Gini, Farhi et al. 2018: 127–29). The doors of the buildings were carefully sealed with stones, and many of them were not resettled again (Tepper, Weissbrod, and Bar-Oz 2015). Probes conducted near the public reservoir in the southern section of Shivta presented similar chronological sequences of abandonment. This is shown by the collapse of a roof in one of the buildings, and by a midden from the Early Islamic period located within one of the deserted rooms (Tepper, Erickson-Gini, Farhi et al. 2018: 128). Thus, it seems that parts of the settlement were abandoned some time before the Sasanian invasion and Arab conquest of the 7th century. Additional information on the sequences of habitation was obtained from the excavations of trash heaps, both outside and inside the settlement. The large outer heaps revealed rich organic materials, and pottery finds dated their use to the 5th–7th centuries. In contrast, the much smaller dumping areas located inside the settlement, within already abandoned buildings, were dated to the Early Islamic period (Tepper, Erickson-Gini, Farhi et al. 2018: 148–49).

This differentiation between two phases of trash deposition in Shivta provides a significant indication for the occupational changes in the site. The wealthy Byzantine village, with its spacious residential buildings constructed between the 4th and 6th centuries, suffered a rapid abatement in the second half of the 6th century. In contrast, the Early Islamic phase of settlement was much smaller, with

many abandoned buildings that were not resettled again. These changes were not associated with the military and political turmoil of the Sasanian and Arab conquests, as they predated them by several decades. It seems then that the leading factor in decline was economic change and the abatement of viticulture economy (Fuks et al. 2020).

This early dating for the abatement of the Negev settlements was further clarified by the recent excavations at Elusa, the central city of the Negev and one of the largest cities in southern Palestine during Roman and Byzantine times (Mayerson 1983). As in Shivta, the new excavations at Elusa targeted the large trash mounds located in the fringe of the city (Bar-Oz et al. 2019). These dumping sites, some of them spreading over ca. 14 ha and reaching a height of 12 m, indicated an urban organization of waste management and regular cleaning of streets, public buildings, and residential areas. The meticulous investigation of the dumps and the stratigraphic dating of the finds provided a clear chronological framework of the refuse dumping, while introducing a new methodological tool for the measurement of urban expansion and demise. The pottery analysis and radiocarbon dating in Elusa indicate that the urban infrastructure went through an abrupt decline around the mid-6th century when the dumping of urban refuse ceased.

The combined weight of the evidence from survey, excavations, and sediment analyses of the studied trash mounds in Elusa and Shivta reveals a complex and asynchronous process of abandonment across the Negev, spanning the 6th–10th centuries. While at Elusa the dumping of trash ceased in the middle of the 6th century, at Shivta, trash removal continued at the outskirts of the settlement until the late 6th or early 7th century and was renewed in the Early Islamic period in a different pattern: the trash piles were located within residential buildings of the town, indicating the abandonment of parts of the settlement, whereas some level of occupation and activity continued.

Nessana, located at the western edge of the Negev settlement system, presents a somewhat different sequence. Here, occupation appears to have been sustained across the Byzantine–Early Islamic transition without much disruption. The continuity of residential areas and churches in Nessana into the 9th and perhaps 10th century was evidenced in the large-scale excavations conducted at the site in the 1990s (Urman 2004, 2008). The rich sequence of finds from these excavations shows that sections of the settlement were constructed in the 7th and 8th centuries, including a “Central Church” located in the southeastern outskirts of the settlement (Urman 2004: 69–101; 2008: 1980). The excavation of this previously unknown church, one of the largest in the Negev, has shown that it was constructed around the late 7th or early 8th century, and was used until the first half of the 9th century (Urman 2004: 101). In addition, a number of residential units and

a monastery at the northern section of the settlement were constructed in the second half of the 6th century (Urman 2004: 31–47). Several probes at the perimeter of the site have shown that the trash removal patterns were similar to those in Shivta, with removal of trash to exterior mounds during the 5th–7th centuries, and the appearance of piles of trash in structures within the settlement appearing in the Early Islamic period (Tepper et al. 2020). It seems that this change reflects the replacement of an organized urban trash disposal pattern with a more random disposal of smaller ash heaps in various locations on the fringe of the settlement.

Parallel to the research of the trash mounds of Elusa, recent excavations within the city were integrated with detailed mapping of its layout by remote sensing and presented a reliable reconstruction of Elusa at its peak, between the 4th and 6th centuries. This research showed that the city indeed declined in the second half of the 6th century but was still inhabited in rural areas during the 7th century, until it was finally abandoned in the 8th century (Schöne et al. 2019). The change of Elusa from an urban center into a rural settlement included the installation of two oil presses above layers of sand that accumulated on top of abandoned streets (Schöne et al. 2019: 149).

These new finds from Shivta and Elusa support additional evidence that indicates a local decline was already occurring throughout the Negev in the second half of the 6th century. When observed next to the evidence indicative of the activity of the wine industry itself, and its dominant place within the broader local economy, a strong correlation emerges, suggesting high levels of interdependency between viticulture and prosperity.

The rise and fall of Negev viticulture is clearly seen in the changes of grape pip frequencies at the Byzantine dumps (Fuks et al. 2020). During the Late Roman period the presence of grape pips was low. A rise in grape pips first appeared in the 4th to mid-5th century when the ratio of grape to cereals was ca. 10% grapes to 90% cereals. Viticulture reaches its peak between the mid-5th and mid-6th century, when grape pips exceeded 40% of total grape to cereal seeds. Local economies flourished, based mainly on extensive production of wine and oil, with surpluses exported out of the region. After ca. 550 a significant drop of grape pips was recorded, back to ca. 10%. The changes seen in the grape pips—demonstrating the rise and fall of viticulture—are also evident in the changes in the ratio of local amphorae (Gaza jars), which were highly abundant in the settlement landfills and were the most common containers used to export wine across the Mediterranean. The presence of Gaza jars shows a peak in the 5th to mid-6th century and a decrease in the late 6th and 7th centuries. In Early Islamic Nessana, where grape pips were still abundant in the 6th and 7th centuries (ca. 30%), Gaza jars decreased dramatically in favor of bag-shaped jars that were less suitable

for camel-pack transports and maritime cargo, indicating the decreasing importance of commercial viticulture and long-distance trade (Fig. 5).

The production volume of the Negev wines was addressed by several scholars who proposed that it provided large surpluses for export (e.g., Mayerson 1985; Rubin 1990). A recent assessment offered an opposing view, concluding that the potential production of the Negev wine presses did not match the consumption needs of even the local population (Seligman 2020). Yet, it seems that the volume of production, which was calculated by Jon Seligman according to the current finds of wine vats in the region, does not represent the actual production volume, as the number of vats that functioned in the region at the height of viticulture cultivation in the 5th–6th centuries was actually much higher, and the production season much longer than the one he used for calculating the overall volume of production (see Fuks, Avni, and Bar-Oz 2021 for a detailed discussion). Thus, it seems that the impact of the wine industry within the entire realm of primary production should

be highlighted, seen not only in vat capacity or grape-pip quantity, but in every aspect of routine life in the Negev, from the abundance of vines mentioned in the written sources to decorative elements on local mosaics. Furthermore, the high quality of the Negev Highland wines made this commodity a very profitable product for the local economy, and this is the most pertinent explanation for the wealthy residential buildings of the Negev villages.

The distinction between the higher quality of the Negev wines in comparison to the mass production of wines in the southern Coastal Plain (see below) requires a specific biomolecular research, based on genetic differentiation of specific types of vines within the regions. At the present state of research, the identification of the Negev Highland wines as representing the best-quality wines of the region is still elusive. Yet, the high-quality construction of the Negev Highland's settlements and the rich material culture found within them is directly associated with the exceptional prosperity of the region and with the expansion of large-scale viticulture (Fuks, Avni, and Bar-Oz 2021; McCormick

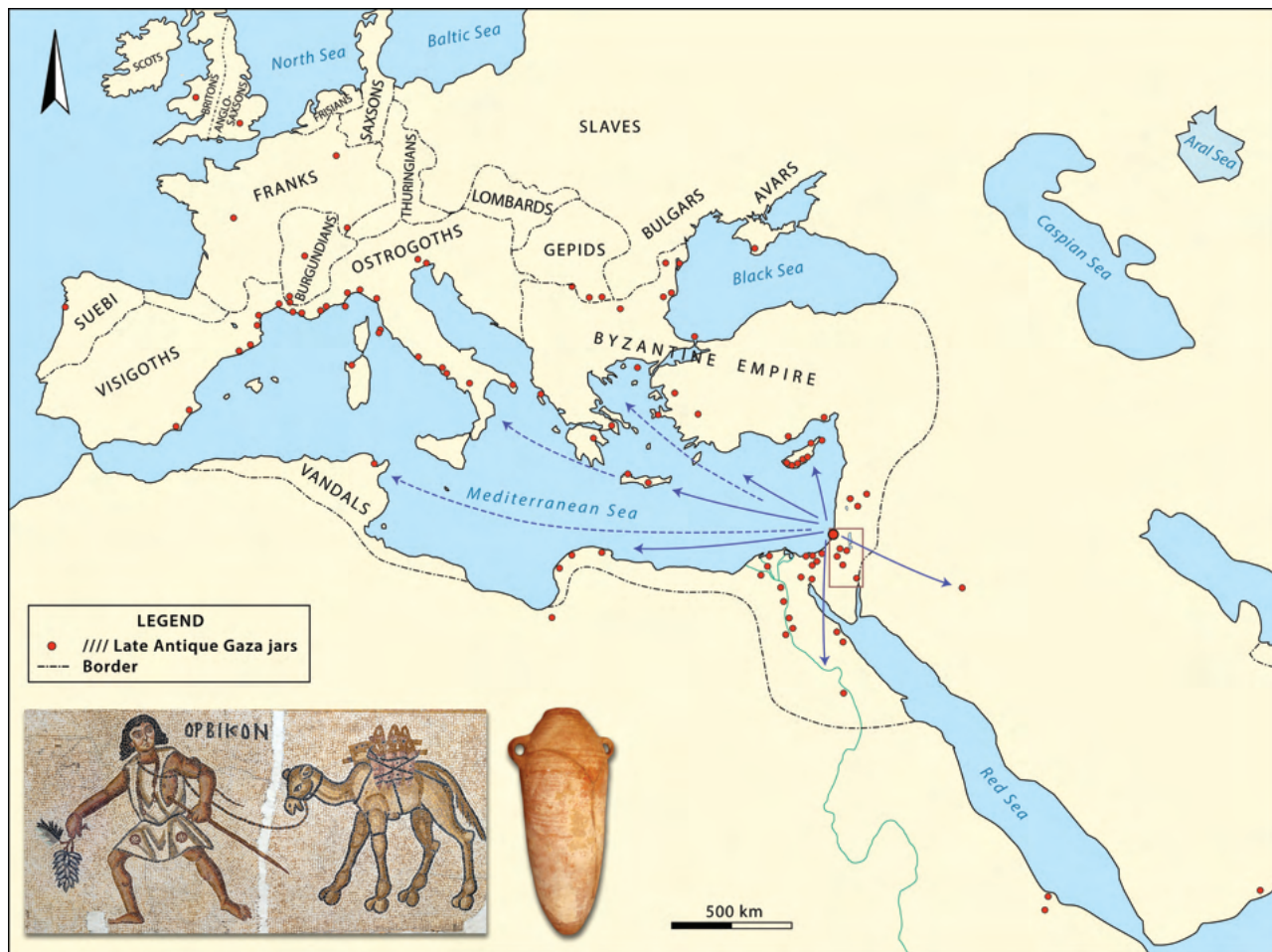


Fig. 5. Gaza jars and Mediterranean trade routes. (Illustration by S. Haad)

2012: 69–73). The fact that the wine industry penetrated the more arid regions of the Negev Highland was likely not only related to growing demand, but also to the better quality of the region’s terroir. Thus, it is assumed that the decline of production of these high-quality wines in the second half of the 6th century was connected to the decline in demand within markets of consumption outside of Palestine. Its immediate impact on the region’s main economic branch was the dramatic decline of the Negev Highland’s settlements.

Yet, it should be noted that the abatement of Shivta and Elusa does not imply that other settlements in the region faced the same fate. As presented above, Nessana shows continuity of its Christian settlement from Byzantine to Early Islamic times. In addition, a network of agricultural farms established in the southern and western Negev Highlands in the second half of the 6th century points to the settlement of nomads who lived on the fringe of sedentary societies (Haiman 1995; Avni 1996; Rosen and Avni 1997). The establishment of these farms may have been a reaction of the Negev pastoral nomads to the decline of Elusa and Shivta and to the changing patterns of local economy. While previously the Negev Highland pastoralists were major suppliers of meat and milk products to the large settlements, the decline of these settlements forced them to turn to small-scale agriculture in the fringes of the Negev Highlands (Avni 1996: 75–90).

The Hinterland of Gaza and Ashkelon

Gaza and Ashkelon were the main hubs of commercial activity—regional centers for the wine industries of the southern Coastal Plain and northwestern Negev, and major seaports for the maritime trade in the eastern Mediterranean (Bitton-Ashkelony and Kofsky 2004; Saliou 2005). Ancient Gaza, which lies under the present-day city, is practically unknown archaeologically, apart from sporadic excavations that revealed the remains of several churches and monasteries in and around the city (Humbert 2000; Moain-Sadek 2000). While there is no data on the residential areas of Gaza, its Late Antique hinterland is better known, consisting of a dense network of agricultural estates that were incorporated into the local wine industry (Hirschfeld 2004a; Huster 2015).

In contrast to Gaza, Ashkelon and its hinterland were extensively explored, with large-scale excavations within the city and numerous rescue excavations in its adjacent hinterland (Israel and Erickson-Gini 2013; Huster 2015; Taxel et al. 2019; Erickson-Gini 2021). The Late Antique city, built on top of earlier settlements from the Middle Bronze age to the Roman period, covered an area of ca. 57 ha. Its domestic architecture shows long-term continuity from the 6th to the 11th century, and the published reports present no evidence for temporal decline in the second half of the 6th century.

However, many modifications were made in the city’s residential areas during this prolonged period of use, and some finds point to changes in urban structures in the late 6th and 7th centuries (Hoffman 2019: 13–71). A decline in public architecture during the 6th century is visible in the civic center of Byzantine Ashkelon, and particularly in the bouleuterion/odeum complex (Boehm, Master, and Le Blanc 2016: 315). This is further emphasized by the results of recent excavations at the hinterland of Ashkelon, which reveal a condensed network of agricultural estates and industrial installations (Israel and Erickson-Gini 2013; Huster 2015; Taxel et al. 2019; Dayan, Barkan, and Radashkovsky 2020; Arbel and ‘Ad 2021; Avni 2021; Erickson-Gini 2021). The exceptionally large size of some farmsteads indicates that they were used as industrial complexes for extensive wine production, far beyond the consumption needs of the local populations (Israel and Erickson-Gini 2013; Waliszewski 2015: 302–20; Lantos, Bar-Oz, and Gambash 2020). The survey of the Ashkelon hinterland revealed 36 industrial estates with large wine vats and many pottery kilns that produced the Gazean amphorae, reflecting the large-scale production of wine in this area (Israel 1995; Baumgarten 2001; Gadot and Tepper 2003; Huster 2015: 42–51 for a summary). Excavations in several estates showed that they functioned between the 5th and the late 6th–early 7th century. This dating correlates with the new finds from the Negev Highlands, showing that the decline of the agricultural hinterland based on extensive viticulture in the second half of the 6th century was a wider phenomenon that extended over large areas in southern Palestine.

Particularly impressive and significant are the remains of the “Third Mile Estate” (Fig. 6), a large compound 4.5 km northeast of Ashkelon, which represents the suburban rural estates (*proasteion*) inhabited by the affluent population of the city (Israel and Erickson-Gini 2013). It contained a residential area with large storerooms, two large industrial wine presses, a large oil press and a pottery kiln, and pools for fish breeding. The coin finds suggest that this estate had already declined by the second half of the 6th century, while the pottery finds show its occupation may have continued until the early 7th century (Israel and Erickson-Gini 2013: 218). While the wide chronological range of the local wares—particularly storage jars and cooking pots—precludes a more precise dating, the coin finds suggest that it suffered a dramatic decline in the mid-6th century, perhaps in conjunction with the effects of the Justinianic plague (Ariel 2013 and see the discussion below).

Additional rescue excavations in large villages and industrial installations of the southern Coastal Plain and the northern Negev refine the picture, supporting an early date for the decline of settlements, in the late 6th century (Avni 2021). For example, a large Byzantine and Early Islamic village excavated in Sderot, east of Gaza, shows a distinguishable

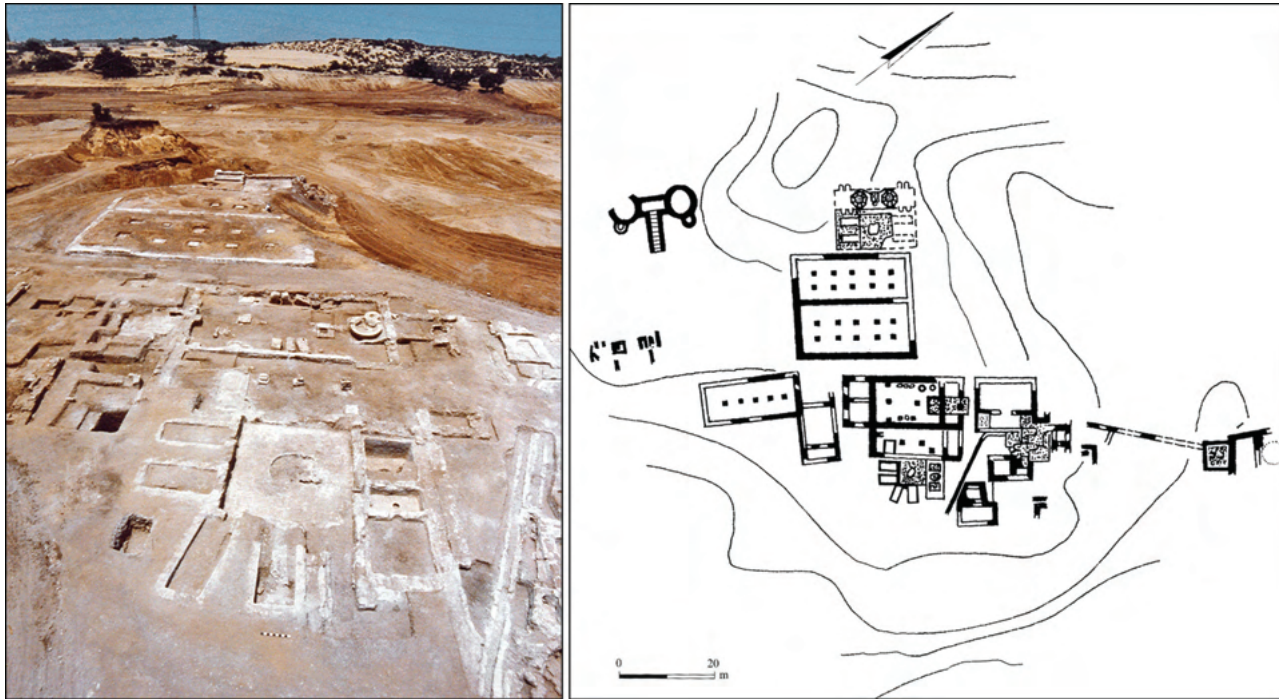


Fig. 6. The “Third Mile Estate” north of Ashkelon. (Photo and plan by T. Erickson-Gini, Israel Antiquities Authority)

change between the 6th and 9th centuries (Varga and Kobrin 2018). In its early phase it contained at least one industrial wine vat, with evidence for adjacent pottery kilns. The village was abandoned by the end of the 6th century and then resettled in the mid-8th century, but with no evidence for continuity of the wine industry at this stage. Excavations in the large village of Khirbet Beer Shema in the northwestern Negev revealed segments of the settlement that included a church decorated with mosaic floors and a large industrial wine vat. The settlement of this village continued up to the early 7th century, then declined in size, while occupation carried on into the Early Islamic period. It seems that here, as in Sderot, there may have been a phase of abandonment between the Byzantine and the Early Islamic periods (Erickson-Gini, Dolinka, and Shilov 2015).

North of Ashkelon, additional indications of a massive industrial complex of wine production and pottery kilns that declined in the late 6th or early 7th century was revealed in Yavneh (early Islamic Yubnah). A large industrial area was exposed, which included an outstanding network of wine presses and pottery kilns that functioned until the 7th century (Yannay 2012; Langgut et al. 2016; Seligman, Haddad, and Nadav Ziv 2022). At Khirbet Baraqa, near Yavneh, a large industrial wine vat and an adjacent pottery workshop revealed a similar chronology (Gadot and Tepper 2003).

It is noteworthy that while the excavations at agricultural estates reveal a picture of decline in the late 6th and

early 7th century, churches and monasteries throughout the southern Coastal Plain and the northwest Negev present a continuity of construction and repair in the second half of the 6th and the early 7th centuries. For example, the church at Magen was constructed in the 6th century; the mosaic pavement at Kisufim, depicting a camel with wine amphoras, was laid in 576; at Maon, a church was constructed in the late 6th century; and in Shellal, near Gaza, another was constructed in 562–63. A similar pattern of church construction appears in Beer Sheva and its surroundings, with two churches constructed in the mid-6th century and another dedicated in 555 (Di Segni 2009, 2017 for references; Fabian and Ustinova 2020).

Like the abatement of Elusa and Shivta, the decline of the wine production centers in the hinterland of Gaza and Ashkelon did not mark the collapse of these rural areas. In numerous locations, for example at Sderot and Khirbet Khatra, settlement was renewed in the 8th century, and in other places lands were redistributed as agricultural estates to the new Islamic elite (Lecker 1989). The large cities and towns continued into the Early Islamic period, but under different economic structures. While the flourishing wine trade diminished, agriculture in the southern Coastal Plain shifted to the production and export of olive oil (Sijpesteijn 2014). The introduction of cotton and other new agricultural species further enriched the local agricultural economy in the Early Islamic period (Watson 1983).

The conditions in the Negev Highlands were harsher, with no major crop replacing the vineyards, but agricultural activity continued or was renewed in a smaller scale up to the 10th century (Avni, Porat, and Avni 2013; Haiman 2020; contra Tepper, Porat, and Bar-Oz 2020). It seems that the decline in the late 6th and early 7th century did not end in abandonment, as most settlements were resilient enough to adapt to the changes in economy, turning from luxurious wine production to local agricultural economies. Few settlements in the northwestern Negev were intensified again in the Early Islamic period, with some very large villages that were only limitedly explored to date, for example, at Horvat Pattish (Avni 2014: 259).

Stressors Near and Far

The picture of decline in agricultural productivity—particularly as relates to viticulture as the main economic branch—hints at several potential causes, including both the external stressors of pandemics, climatic fluctuations, and local environmental changes, as well as economic factors of both supply and demand, and production and consumption, in Palestine and across the Mediterranean.

Plague

The effects and impact of the first world pandemic, known also as the “Justinianic Plague” (541–543) has been the source of a lively debate in the last decade, developing into two opposing approaches: the “maximalists,” who see the plague as a major stressor that reshaped the economy and settlement process throughout Europe and the Mediterranean (e.g., Harper 2017, McCormick 2021), and the “minimalists,” who, while not denying the devastating effects of the plague, favor the view of a less significant impact on settlement and society (see particularly Haldon et al. 2018; Mordechai and Eisenberg 2019; Eisenberg and Mordechai 2019; but also Meier 2016, 2020, who rejects this polar division). A major component in this debate is the recent biomolecular detection of *Yersinia pestis* as the pathogen that spread the plague over large distances across the Eurasian continent.

Historical sources provide vivid descriptions of the effects of the pandemic on urban and rural communities in the eastern Mediterranean: Procopius, for example, tells that the daily number of deceased in Constantinople reached ca. 10,000 people, and that corpses were disposed of in both mass graves and into the sea. John of Ephesus, who traveled through Syria and Palestine in 542, described abandoned villages whose inhabitants perished altogether, with “houses and waystations occupied only by the dead, corpses lying in the fields and along the roadside, and cattle wandering untended into the hill” (quoted in Sarris 2011: 159). Greg-

ory of Tours devotes significant sections to an eyewitness description of the plague and other epidemics (McCormick 2021). Additional references on the devastating effects of the plague may be found in epigraphic material, such as an inscription from Jordan relating that a third of the world population had perished in the plague (Di Segni 2006). The identification of the pathogen of *Yersinia pestis* in mortuary archaeology across Europe and the Mediterranean was achieved in several excavations (for a summary, see Sarris 2011: 158–70; Harper 2017: 199–245; Mordechai and Eisenberg 2019: 31 for a remark on the paucity of finds, and McCormick 2021: 46–49 for a response). In addition, a detailed survey of mass burials in the Mediterranean presents a significant number of sites in which multiple burials were found (McCormick 2016).

However, the direct impact of the plague on Palestine and Jordan is still elusive in the archaeological findings. Despite extensive excavations that include hundreds of sites from this period, no significant indications for the effects of plague on local populations have been found to date. A possible indication for an increase in the number of deaths may be found in the rise of dated epitaphs in the 540s, but the total numbers are still very low, only 20 to 30 per year (Benovitz 2014). The decline in the number of dated inscriptions in the 540s may serve as another indication of the impact of the plague (Di Segni 2017; but see the alternative approach of Mordechai and Eisenberg 2019). The current authors believe that while the short-term effects of the plague—for example, the rise in the number of deaths as reflected in the historical sources—are still less visible in the archaeological record, the long-term impacts of the plague on the economy and society in Palestine are reflected in the change of the economic infrastructure, as shown particularly in the decline of the wine industry. The long-term and worldwide impact of the pandemic was significant in affecting commercial and industrial patterns in the Mediterranean, particularly in the consumption of luxurious commodities such as Gaza and Ashkelon wines. This is especially noteworthy as the initial outbreak of the plague was followed by a number of additional outbreaks during the second half of the 6th century (Harper 2017: 235–45; McCormick 2021: 75–96).

Climate

The debate about climate change during Late Antiquity and its societal effects is still very much in progress, and ranges from one extremity, locating this period within a 250-year-long devastating short ice age (Büntgen et al. 2016; Harper 2017), to another extremity, emphasizing the Mediterranean basin’s climatic variability (Haldon et al. 2014; Haldon and Rosen 2018). This latter, most critical approach towards Late Antique temperature change would

have seen widespread Northern Hemispheric cooling occurring between the mid-530s and the 590s, leading to intensive floods in the central Mediterranean (e.g., see Squatriti 2010; Zanchetta et al. 2021 for central and northern Italy).

High-resolution analysis of the speleothem archive from the Soreq Cave in the Judean Mountains suggests that rainfall rates decreased by ~200 mm/yr between the 1st and the 8th centuries C.E., with some increase in precipitation between the beginning of the 4th and mid-6th centuries (Orland et al. 2009). This somewhat contrasts the observation in Bookman et al. 2004 of lake level changes in the Dead Sea that suggest significant periods of “high-stand” of the water level, coinciding with the Roman period and the Early Byzantine period, peaking in the 4th century, and being followed by a significant phase of “low-stand,” starting in the 5th century. Both Bookman et al. and Orland et al. argue that the climatic shifts leading to the lower precipitation and lake levels of the Dead Sea in the mid-1st millennium C.E. were responsible for the decline of the Byzantine settlements. However, neither a decrease of 200 mm/yr in the Judean Mountains, nor fluctuations in Dead Sea lake levels, directly inform us as to rainfall amounts in the Negev Highlands during the same period.

As part of the bioarchaeological research project in the Negev, another proxy was applied to examine whether climate change coincided with cultural shifts during the Byzantine and Early Islamic periods (Vaiglova et al. 2020). Stable isotopic indicators of sheep and goat teeth were used to assess the extent of the vegetative cover in the studied area. The embedded oxygen and carbon isotopes in tooth enamel served as a climatic archive, using the same methodology used in speleothem analysis. The results of this analysis have shown that the Negev Highlands were not greener than they are today, and that the composition of animal diet, as well as their grazing patterns, remained unchanged. Thus, direct evidence for vegetation in the vicinity of the settlements relevant to this research have shown no significant change in annual mean precipitation and point to stability in the local Negev microclimate.

Nevertheless, similarly to the pandemic, the indirect consequences of regional climate fluctuations in specific areas around the Mediterranean, brief as it might have been, may well have impacted the fragile Negev economy by generating reduced universal demand for Gaza and Ashkelon wines (Gambash forthcoming).

Local Environmental Conditions

Located on the fringe of the large loess plains and sand dunes, the northwestern Negev settlements were increasingly affected by a major event of sand dune mobilization that started towards the end of the 6th century and lasted

until the early 10th century (Roskin, Katra, and Blumberg 2013; Taxel et al. 2018). The event was the largest of its kind documented for the Holocene and is likely to have been intensified—if not instigated—by the preceding population boom. Procopius of Gaza (450–525) dramatically captured early apprehensions of such a process in a letter written to a friend named Jerome: “there will be a day when you will see Elusa again and you will weep at the sand being shifted away and the vines naked to their roots” (Mayerson 1983: 252–53; *Proc. Gaz., Epist.* 81). The damages to the vine plantations, and consequently to the wine industry, the city’s main income, would have had an immediate impact on the resilience of the local society. In this context it is interesting to note that in ca. 570 the anonymous pilgrim of Piacenza described Elusa as located at the “head of the desert that extends to Sinai” (Mayerson 1983: 253).

Economic Decline and Reduced Demand

In addition to the possible climatic, environmental, and epidemiologic effects on local societies, it seems that the major factor that triggered the decline of the extensive agricultural hinterlands, viticulture, and wine production in southern Palestine was the impact of the economic changes that took place in the wider Mediterranean basin (Fig. 7). The rise to prosperity of the Negev settlements aligns with the significant rise in demand of prestige wines from the east in the western Mediterranean (Ward-Perkins 2000: 374). Italy, North Africa, Southern Gaul, and other regions demonstrate through ceramic analysis a sharp rise in demand for eastern goods (McCormick 2001: 101–5). It is the same essential indicator of amphoras that shows the peak of this rise in demand towards the end of the 5th century and shows a steady decline in eastern exports to the west during the 6th century, with African exports gradually taking over, while the absolute size of western markets dwindled. Another example of the decline of international trade in the Mediterranean may be found in the significantly smaller number of shipwrecks in the central and western Mediterranean during the 6th century in comparison to their higher number in the 4th and 5th centuries (McCormick 2012: 80–88).

The correlation between the decline of wine production in Palestine and the deterioration of maritime trade in the Mediterranean, nearly a century before the Arab conquest, seems to provide another blow to the well-known Pirennean paradigm on the history of the Mediterranean during Late Antiquity (McCormick 2001: 573–80).

Conclusion: From Affluence to Decline

The results of the recent research in the settlements of the Negev Highlands and northwestern Negev, together

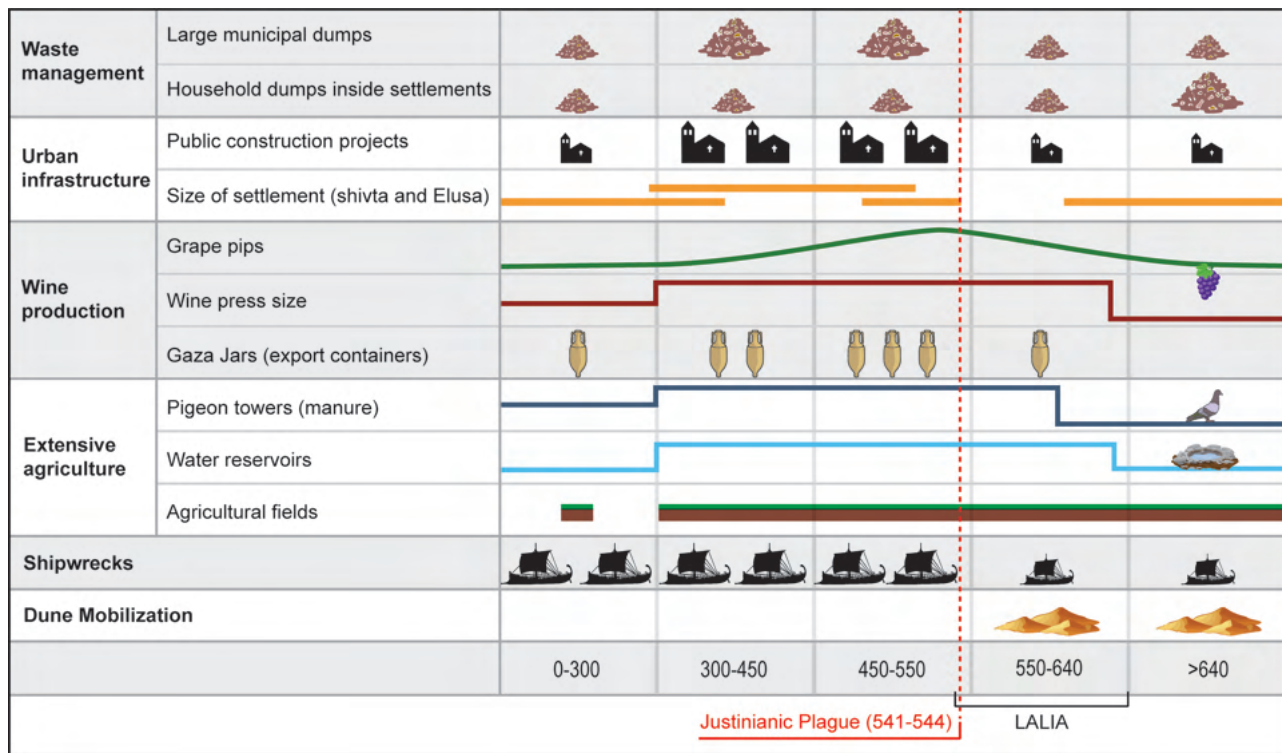


Fig. 7. Summary of intensification and abatement in settlements characteristics in the Negev Highlands, 1st to 7th centuries: waste management, urban infrastructure, wine production, and extensive agriculture. (Illustration by S. Haad)

with the accumulating data from scores of rescue excavations in the southern Coastal Plain, open the way for a new interpretation on the process of change in settlement and economy in southern Palestine between the 6th and 8th centuries. A major contribution was provided by the new evidence on the decline of Shivta and Elusa in the late 6th century. From a wider perspective, the connection between the decline of the Negev settlements, the abatement of the wine industry and pottery production in the southern Coastal Plain, and the slowdown in international maritime trade in the Mediterranean suggest a new framework for the process of change in urban and rural communities in Palestine and beyond.

The excavations in the hinterlands of Gaza and Ashkelon and in the Negev Highlands present a complex picture of affluence and decline. The local wines produced in the region were particularly notable for their excellent quality, and the large-scale export of Palestinian wines was reflected in the wide distribution of Palestinian amphoras (the “Gazitia” and “Askalonia” jars) around the Mediterranean, in central and western Europe, and along the Red Sea (Mayer-son 1985; Pieri 2005, 2012; Lantos, Bar-Oz, and Gambash 2020). This industrial and commercial network faced a sharp decline in the late 6th century as a consequence of the decreasing demand for wine and the abatement of maritime trade (McCormick 2012; Pieri 2012; Decker 2013).

The detailed picture of 6th and early 7th century settlement fluctuations in the Negev and southern Palestine, combined with the significant decline in the frequency of grape pips from the mid-6th century as found in the excavations at Elusa, Shivta, Nessana, and Avdat, reflect the sharp drop in vine plantations and the wine industry (Fuks et al. 2020; Lantos, Bar-Oz, and Gambash 2020).

The new chronology suggested here for the decline of settlements, farmsteads, and agro-industrial centers in Southern Palestine, starting in the mid-6th century, is supported by high correlation with clearly identifiable economic pressures, exerted both locally and regionally. The demand-and-supply equation, which persisted since the 4th century and was a major contributor to the Negev’s growing prosperity, rapidly lost value with both its sides suffering from a set of changing circumstances. Demand for the wine produced in the Negev and shipped from Gaza and Ashkelon to the entire Mediterranean dropped significantly as a result of the 542 pandemic, climatic fluctuations in the West, and a few decades later, the change in consumption habits within the rapidly growing Islamic realm. The primary production of that wine suffered from the direct impact of plague and then war, as well as from increasingly encroaching sand dunes.

The decline of the Negev manifests the unprecedented impact of falling demand for wine in its global reach. As

such it offers archaeologists an exciting arena to further explore the direct effects and disruptions to both supply and international demand. The economic crisis in the Negev, which very much relied on the growing economic imperialism and international trade that foreshadow what we now call globalization, posed a vicious cycle that dampened the wine industry within a few decades. These findings indicate that in periods of interconnected global economy, peripheral economic enterprises, like those in the marginal areas of the Negev Desert, were particularly vulnerable to environmental changes and internal economic processes.

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