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The Unique Specialised Economy of Judah under Assyrian Rule and its Impact on the Material Culture of the Kingdom

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ABSTRACT

The geography of Judah is unique among the territorial kingdoms of the southern Levant, featuring four distinct regions with the potential for exploitation in different economic strategies. In the Iron IIB the vassal kingdom experienced a dramatic economic transformation directed by the Assyrian empire, from traditional Mediterranean subsistence to specialised economy based on its four zones: viticulture in the highlands, oleo-culture in the Shephelah, services to the Arabian trade in the Beersheba Valley and date and exotic plant groves in the Dead Sea Valley oases. This high-risk/high-gain system may clarify the development of advanced administration, which, in turn, explains the unique features in the material culture of Judah compared to neighbouring kingdoms: The system of stamped handles and weights and the proliferation of scribal activity. The division of the kingdom into districts, as portrayed in Josh 15, is connected to this reality, and hence probably originated slightly earlier than conventionally argued.

KEYWORDS

Judah; agricultural specialisation; viticulture; olive horticulture; administration; *lmk* stamped handles; ostraca; writing; Joshua 15

Introduction

The geography of Judah is unique among the territorial kingdoms of the Levant. Judah stretches over four different geographical units: the highlands, Shephelah (hilly lowlands), Beersheba Valley and Judean Desert including the shores of the Dead Sea (Figure 1). This division is recognised in the biblical text, first and foremost in the list of towns in Joshua 15. The four units differ in their rock-formations, topography, climate and hence vegetation. As a result, they offer distinct subsistence opportunities, which resulted in different settlement patterns. Intensive archaeological exploration allows reconstructing the settlement activity and economic base of each of the four geographical units and investigating their impact on the history and unique material culture of the kingdom. In what follows we focus on the economy of Judah in the ‘Assyrian Century’ in its history, c. 730–630 BCE.

Below we clarify our basic attitude to issues which are central to the reconstruction of the settlement, demographic and subsistence patterns in Judah.

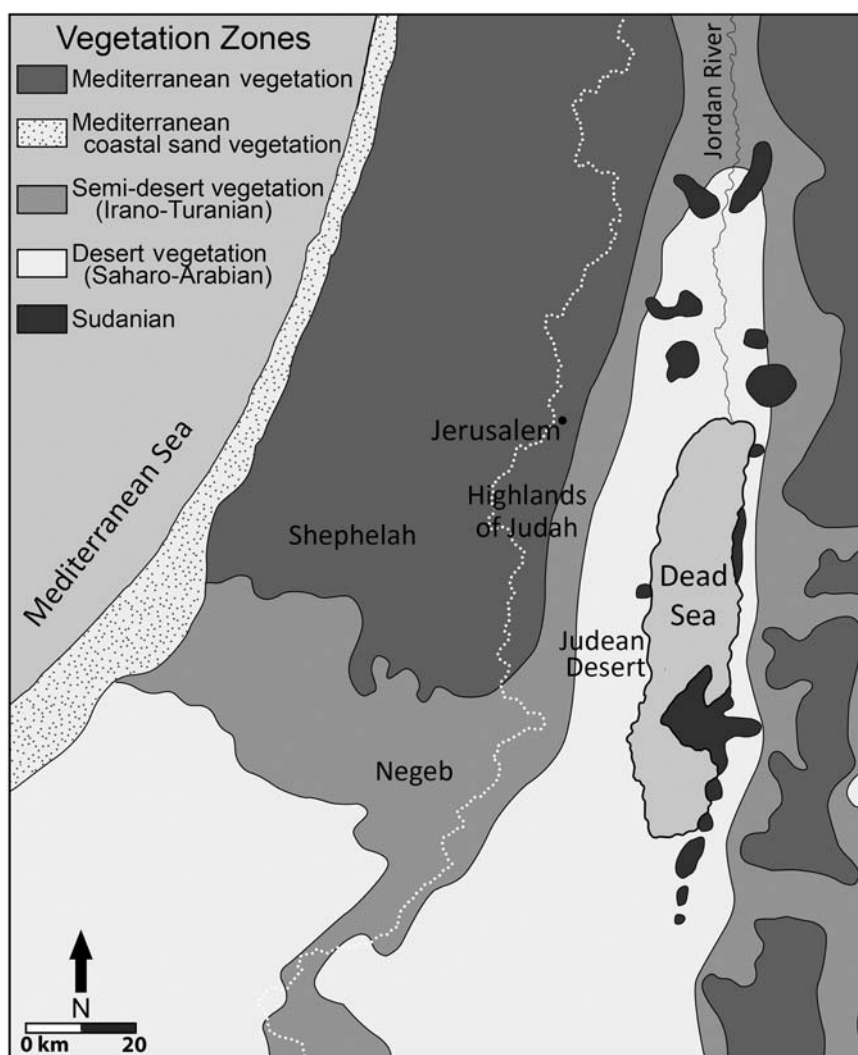


Figure 1. The four geographical units and vegetation zones in Judah (for the latter, after Zohary 1962). The watershed is represented by the white dashed line.

Chronology

Below we use a chronological outline that is radiocarbon-based for the early phases of the Iron Age (see, e.g., Finkelstein and Piasezky 2015) and historically/culturally based for the later phases (in which radiocarbon cannot be used due to the Hallstatt plateau). We date the Iron I from the late 12th century to around the middle of the 10th century BCE; the early Iron IIA until the very early 9th century; the late Iron IIA until c. 800 or the early 8th century; the Iron IIB until sometime in the first half to the middle of the 7th century BCE; and the Iron IIC thereafter, until 586 BCE.

Territorial expansion of Judah

Until the late Iron IIA the territory of Judah covered mainly the southern highlands, meaning that its extent was not different from that of the Late Bronze city-state of Jerusalem. Judah expanded to the Shephelah in the late Iron IIA, either before or after the destruction of Gath in the years following the middle of the 9th century BCE (Naaman 2013; Fantalkin and Finkelstein 2006, Sergi 2013 respectively). Here we focus on the Judahite, that is eastern part of the Shephelah, acknowledging that several of the patterns observed below can also be identified in its western sector, which was dominated by Gath and later Ekron. Judah expanded to the Beersheba Valley around the middle of the 9th century, with the decline of the Tel Masos desert polity (Finkelstein 2014).

Settlement patterns¹

The Judean highlands, characterised by rocky terrain, was sparsely settled until the late Iron IIA, which features the first demographic expansion south of Jerusalem. Settlement activity grew dramatically in the Iron IIB and continued uninterrupted in the Iron IIC. Similar patterns were identified in the settlement history of the kingdom's capital Jerusalem. The Shephelah was sparsely settled in the Iron I and early Iron IIA; activity grew in the late Iron IIA and peaked in the Iron IIB. Sennacherib's 701 BCE campaign caused severe devastation, but the region gradually recovered, though the settlement pattern changed: activity in the Iron IIC concentrated more in the main towns than in small villages and isolated farmhouses. Iron IIA activity in the Beersheba Valley was limited to several central sites, such as Tel Beer Sheva and the fort of Arad. Settlement activity in the region expanded in the Iron IIB and continued in the Iron IIC. Significant activity in the Judean Desert and the shores of the Dead Sea can be observed only in the Iron IIB–C (for all this, see Finkelstein and Silberman 2006a with references).

Demographic growth in Judah

The dramatic growth in size and number of inhabitants of Jerusalem and in the settlement activity in the highlands and the Shephelah was probably the result of two factors. The first was the incorporation of the kingdom as a vassal into the Assyrian global system. According to one of us (IF), the second was the migration of Israelites after the takeover of Israel by Assyria in 732–720 BCE (Finkelstein 2015 with references to previous studies).

Climate

The high-resolution, well-dated pollen records from the Sea of Galilee and the Dead Sea (Langgut et al. 2015), show a severe dryness phase c. 1250–1100 BCE, followed by an increase in arboreal percentages, representing humid conditions, between c. 1100–750 BCE (Langgut, Finkelstein and Litt 2013). The latter phase covers most of the Iron I and Iron IIA. In c. 750–586 BCE (the end-phase of the Iron IIB and the Iron IIC), the region experienced moderate climate conditions (Finkelstein and Langgut 2018). These trends have recently been evaluated vis-à-vis oscillations in the settlement patterns

along the fringe areas in the south and east of the southern Levant. The results show that climate is only one of the factors that influenced settlement and economic processes in the region in the Bronze and Iron Ages (Greener, Finkelstein and Langgut 2018).

Terracing

Terraces cover over 60% of the landscape in the Jerusalem highlands (Ron 1977) and considerable parts of the Judean highlands further to the south. Their construction resulted in a significant rise in the carrying capacity of these areas. Dating the terraces by conventional archaeological tools is difficult. A recent OSL dating of soil supported by terrace walls shows that terracing became a meaningful component of agricultural activity in the region in the Hellenistic period. It has also been demonstrated that vast terracing is the product of land management policies that engage large workforces (Elgart-Sharon, Porat and Gadot 2020). Regarding the Iron Age, possible evidence for sporadic terracing was recorded at Nahal Shmuel northwest of Jerusalem (see below), but as a rule it seems that the dominant cultivation method was based on stone clearance and the exploitation of soil pockets between rock outcrops.

Terminology

The term 'Late Iron Age' which is used below for Judah, signals the main part of the Iron IIB and the Iron IIC, meaning between c. 730 BCE and the destruction of the kingdom in 586 BCE. In other words, we refer to the 'Assyrian Century' in the history of Judah and the years that followed the withdrawal of Assyria from the region.

By 'traditional Mediterranean economy' we refer to the risk-reducing, self-sufficient subsistence economy of mixed dry-farming, horticulture and animal husbandry. The people of the Middle East have had the knowhow to engage in all three avenues of subsistence and to change the balance between them according to shifting historical, economic and climate conditions. By 'specialised economy' we mean subsistence of a given area based mainly (but never solely) on a single crop. This was a high risk/high gain system that depended on the existence of regional markets and, equally significant, a strong centralised government that could quickly react to changing conditions, among them droughts.

Economic Patterns in the Late Iron Age

The Highlands

We start with the area west of Jerusalem, which has been intensively investigated and can therefore serve as an illustration for the highlands part of the kingdom. We will then comment on the broader picture of the highlands south of the city.

The site of ancient Jerusalem is located east of the highlands' watershed, on the fringe of the Judean Desert (Figure 1). Much of the immediate surroundings of the city are characterised by inhospitable, arid (in the east) and rocky terrain; very few settlement sites from any period have been recorded in this area (Gadot 2015). The situation further to the west is different. This part of the hill country is dominated by two

major valleys—the Soreq and the Rephaim—which merge c. 10 km to the southwest of Jerusalem. Together with their tributaries, they served as the ‘food basket’ of the city (Edelstein and Gibson 1982). Parts of these valleys feature rich alluvial soil suitable for dry farming, while the slopes could be used for vine and olive orchards; small springs located along their course could have been used for watering crops which require irrigation.

The Late Iron Age marks an extraordinary intensification of rural activity in the Soreq and Rephaim Valleys (Gadot 2015). Sixty-five sites have been recorded in previous publications and a few more have been excavated recently (e.g., Storchan 2015; 2017). The accumulated data allow reconstructing the subsistence-base of at least some of the sites and establishing the hierarchy between them. The system can be described as four-tiered: (i) large sites, which demonstrate signs of administrative function; (ii) villages; (iii) isolated buildings/farms; (iv) production spots such as wine presses, not related to habitation sites.

West of Jerusalem Tier (i) is characterised by Tel Moza. Thirty-seven large granaries were unearthed (Greenhut and De Groot 2009), that could store large quantities of grain from fields in the broad valley of the Soreq slightly to the northeast of the site. The fauna of the site also hints at its role in supplying animal products to the capital (Sapir-Hen, Gadot and Finkelstein 2016). The limited number of handles with stamp impressions indicates that storing liquids—most probably wine or oil—was not an important component of the site’s economy. Though slightly outside of the niche discussed here, the monumental, palatial centre of Ramat Rahel should also be listed. While not a single silo was found there, and with animal economy typical of a consumer (to differ from production) site, the high number of stamped storage jars handles indicates Ramat Rahel’s role as a collection centre for taxes in kind (Lipschits et al. 2016).

Tier (ii) constitutes villages such as Kh. el-Burj and ‘Alona to the northwest and Kh. er-Ras to the southwest of Jerusalem. They feature large structures that were either built one next to the other or at some distance from each other (Weckler-Bdolah 1997 for ‘Alona; Gadot 2015 for Kh. er-Ras) and are surrounded by rock-cut agricultural installations, mainly wine presses.

Thirty-three sites may be classified as farms/single buildings (Tier iii). They are not uniform in their ground plan; some were built just to fit the topography, while others were pre-planned (Gadot and Bocher 2019). One example, unique in its size and number of rooms, is the ‘Storeroom Building’—part of a cluster of structures located along the upper Soreq Valley (Gadot et al. 2019). Other examples have a large courtyard in the front, surrounded by two or three wings (see, e.g., the building in Mamilla, immediately west of the boundary of Iron IIB–C Jerusalem, Amit 2011). The distribution of these structures all along the tributaries of the Rephaim and Soreq Valleys demonstrates the strong farming activities that took place in this region.

The main agro-production installations (Tier iv) documented along the Rephaim and Soreq Valleys and their tributaries are the rock-cut wine presses which are found both inside settlements and in the countryside. Greenberg and Cinamon (2003) listed 35 Iron Age wine presses in the Rephaim Valley. Table 1 presents an updated count, which includes similarly dated wine presses found along the Soreq Valley, as well as newly published ones from the Rephaim Valley. All in all, the number now stands at 57 installations.

Table 1. Excavated and surveyed Late Iron Age wine presses along the Rephaim and Soreq Valleys.

Site	No. of presses	Valley	Reference
Rogem Gannim	8	Rephaim	Greenberg and Cinamon 2006
Giveat Massuah	5	Rephaim	Ovadia 1993
Beit Safafa	4	Rephaim	Feig 2003
Manahat	16	Rephaim	Greenberg and Cinamon 2006
Kh. er-Ras	2	Rephaim	Gadot 2015
Emeq Lavan	3	Rephaim	Storchan 2015
Ein Lavan	1	Rephaim	Baruch 2006
Nahal Draga	3	Kidron	Brzaily per. Com.
Har Homa	1	Kidron	Solimany 2012
Pisgat Zeev	1	Zimri	Maitlis 1991
Tell el-Ful	1	Soreq	Nagar-Landes 2014
Ramot Shlomo	1	Soreq	Storchan 2017
Ramot forest	3	Soreq	Davidovich et al. 2006, Site 14/26
Nahal Shmuel	5	Soreq	See below
Alona	2	Soreq	Wecksler-Bdolah 1997
Wadi Ein Karem	1	Soreq	Gadot Pers. Com.

Iron Age winepresses seem to feature one or two niches carved into the back wall of the treading surface (Amit and Yezerski 2001; for this type, see [Figure 2](#)). Excavation conducted by one of us (YG) at Kh. er-Ras seems to have unearthed direct evidence for this dating. Two wine presses were found at the site, both associated with Late Iron Age structures. Especially apparent was the connection between Wine Press I, which has a curved niche in its back wall, and Building II; the western external wall of the building also served the wine press ([Figure 3](#)), suggesting that the two were built together. An



Figure 2. Iron Age wine press in the Jerusalem highlands characterised by the two small niches that were etched in the vertical rock wall at the back of the treading surface. The niches may have been used to install a wooden beam that was employed for secondary pressing of the crushed grapes.



Figure 3. Wine press I and the southwest room of Building II at Kh. er-Ras.

assemblage of at least 23 holemouth jars was found in the room just east of this wine press (Freud 2018, Plate 79). These jars, conclusively dated to the Iron IIC, were probably used to store wine produced at the site.

An illuminating example of the specialised wine industry in the highlands west of Jerusalem has been studied by two of us (YG and DL) along the eastern slope of Nahal Shmuel. The slopes here were only sporadically terraced. Instead, intensive stone clearance activities created small and shallow soil pockets between outcrops of limestone rock formations. More than 50 heaps of stones in various shapes and sizes were documented in a survey of the site. One of these was sampled using OSL dating technique. The result shows that the soil at its base had last been exposed to sunlight $2,400 \pm 160$ years ago, a date which fits the period after the Babylonian conquest, until the Early Hellenistic period. Five rock-cut wine presses, with rectangular niches fitted into their carved back wall, were also documented at the site. Remains of at least four stone-built structures were traced between the many stone piles. One such structure, located at mid-slope, was excavated. It is a rectangular platform measuring approximately 4.5×6.5 m, made of large field stones, with no evidence for floor or partition walls. The structure was apparently used as a watchtower (for parallels in the traditional agriculture in the highlands in recent generations, see Ron 1977). The pottery found in the fill of the structure dates to the Iron IIC.

The Nahal Shmuel eastern slope was adapted in the Iron IIC to growing grapes for wine production. The grapes were planted in soil pockets between rock outcrops. We assume that the grapes were not trellised; rather, they were cultivated on the ground (see a picture from the early 20th century in Figure 4). This cultivation method is more common in traditional agriculture when growing grapes for wine production, since contact with the ground promotes fruit ripening due to the heat. The small stone-built structures served as watchtowers and possibly also as temporary shelters

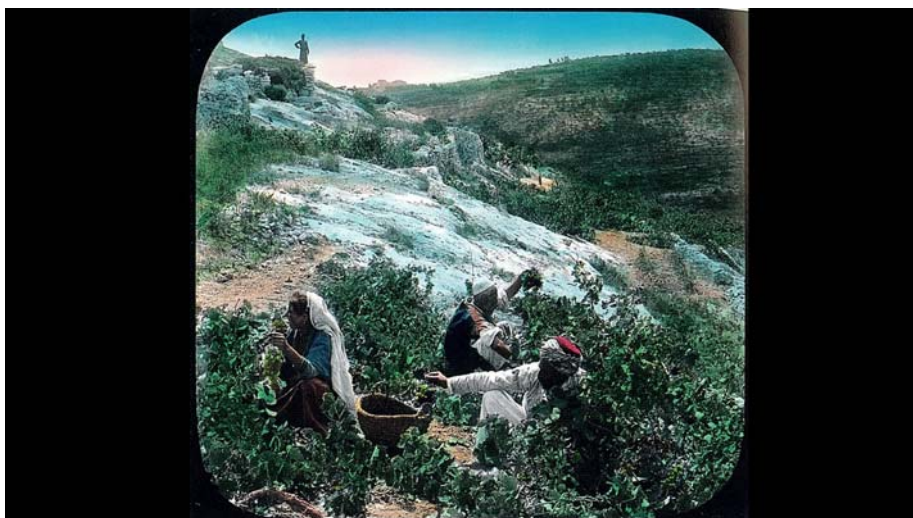


Figure 4. Harvesting of grapes in soil pockets in the Hebron hill country (early 20th century). Grapes grown on the ground ripen early, at the beginning of the summer. In the background to the left, a watchtower located at mid-slope and a stone pile (Undated [1900s-1930s], American Colony photo, department photographers, Roggel Collection, Rehovot IL; courtesy of *Bitmuna*).

for equipment and products, as well as to guard the area (for the Hellenistic-early Roman period in western Samaria highlands, see Applebaum, Dar and Safrai 1978; for recent centuries in the highlands, see Ron 1977). An interesting textual reference to this kind of viticulture in the highlands can be found in Isaiah 5:1–2.

The Nahal Shmuel plots were part of a much larger wine industry. Rock-cut, jar-shaped cellars were found in clusters at several Iron Age sites in the Benjamin plateau slightly to the north. The largest concentration, with as many as 63 cellars, was found at Gibeon (Pritchard 1964, 1–8). Pritchard interpreted them as storage facilities for ageing wine. Twenty-four such cellars were found at the site of Kh. el-Burj, located on a high hill overlooking Nahal Shmuel two km from the wine presses described above (De Groot and Stern 2013). It seems that this site was the collection centre for wine grown along the slopes of Nahal Shmuel and other nearby tributaries of the Soreq.

Contrary to the high number of wine presses found in the highlands west of Jerusalem, the number of Iron Age olive presses in this area is small. One such installation was found on the City of David ridge within a rock cut room that was possibly used for cult activities during the early 8th century BCE. Three installations were found in villages surrounding the city.²

The spring system of Ein Joweizeh in the Rephaim Valley represents another aspect of activity in the Jerusalem highlands. Water was directed via a long rock-cut and built tunnel into a collecting pool, from where it was probably channelled to irrigated plots on terraces below the spring. The monumentality of the spring house, which was equipped with stone-carved decorated capital (Ein Mor and Ron 2016), indicates that it was part of a public enterprise, possibly a royal estate in the style of an Assyrian style *Bitanu*. Indeed, the Ein Joweizeh setting may be compared to Assyrian reliefs depicting royal gardens (for the latter, see Asadpour 2018). Ein Joweizeh provides

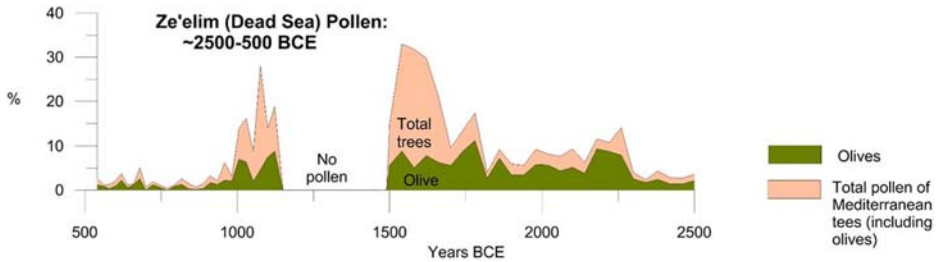


Figure 5. Simplified pollen diagrams of the Dead Sea (Zeelim) record presenting paleo-environmental reconstruction for the c. 2500–500 years BCE time interval (after Finkelstein and Langgut, 2018, Fig. 2b).

evidence that the method of rock-cut tunnels aimed at enlarging the flow of water from springs, which is typical of the highlands west of Jerusalem, was developed in the Late Iron Age (Yechezkel and Frumkin 2019), hence other royal estates may have existed in this region.

The situation in the Judean hill country to the south of Jerusalem is less clear, due to the relative dearth of archaeological information. High altitude makes the Hebron area non-compliant to olive horticulture and hence this area was probably devoted to grape growing (for olive tree habitat requirements, see Zinger 1985; Finkelstein and Langgut 2018). Indeed, this has been the situation in the region in recent generations. The reference to Ziph as one of the four toponyms in the *lmlk* seal impressions hints at the possibility of a royal estate south of Hebron. The Dead Sea Zeelim palynological record exhibits a significant decrease in olive pollen in the Late Iron Age compared to the Iron I, probably indicating shrinkage of olive horticulture in the lower elevations of the southern highlands (Finkelstein and Langgut 2018; Figure 5). Interestingly, grape pollen, which is usually under-represented in palynological spectra, begins to appear in the Ein Gedi pollen diagram at the later stage of the 8th century BCE (Litt et al. 2012). Low arboreal values in the Dead Sea pollen records (Zeelim and Ein Gedi) during the Iron Age II do not reflect diminishing precipitation, as sediments along the lake were embedded in high lake levels (Langgut et al. 2014; Kagan et al. 2015). Rather, this must reflect the peak of settlement and agricultural activity, meaning massive deforestation in the Judean highlands in the Iron IIB–C (Ofer 1994; Finkelstein and Silberman 2006a) in preparation of land for cultivation.

The Shephelah

While the archaeological and palynological evidence point to the expansion of viticulture in the Judean highlands, a different picture emerges from the Shephelah. Large-scale olive horticulture in this part of the kingdom during the Late Iron Age is evident by the widespread occurrence of olive oil installations.³ Olive oil presses are usually located not too far from the orchards in order to save the need to transport the raw material and as the oil extraction should take place no more than 48 hours from harvest, in order to avoid bitterness of the fruit.

To date, the earliest evidence of intensive olive oil production in the Shephelah is attested at Tell es-Safi/Gath in the western (non-Judahite) sector of the region (Maier,

Welch and Eniukhina 2021). Several such installations dating to the late Iron IIA were found in the lower city, indicating that much of this part of the settlement was dedicated to the production of olive oil. The takeover of the region by Assyria dramatically boosted its olive oil industry. An unprecedentedly large olive oil facility dated to the Late Iron Age was identified at Tel Miqne-Ekron, also in the western Shephelah. Exhibiting over 115 installations, it is described as the largest olive oil industry in antiquity (Gitin 1997; Eitam 1996). Additional evidence for olive oil production in this part of the region during the Late Iron Age was documented at Tel Batash, where excavations revealed several olive presses similar to those found at Tel Miqne-Ekron (Mazar 1997, 262–63).

Evidence of large-scale specialised olive oil production is also found at Judahite sites in the eastern Shephelah, which date to the Iron IIB before the Sennacherib campaign in 701 BCE. We refer to the olive presses found in the relevant layers at Tell Beit Mirsim and Beth-Shemesh (Eitam 1979; Bunimovitz and Lederman 2009 respectively). Whether this industry developed with the incorporation of Judah as a vassal into the Assyrian economy in 732 BCE or commenced in a slightly earlier phase of the 8th century BCE, is impossible to say with the data at hand. The large number of *lmk* storage jars which were retrieved from Level III at Lachish (Lipschits, Sergi and Koch 2011, 10) may also be related to the extensive olive oil production in the Judahite Shephelah, suggesting royal control over olive oil distribution. The Sennacherib Lachish relief, in which one of the most common plants can possibly be identified as olive tree (Amar 1999), may provide another testimony for the cultural landscape of the Shephelah.

The town on the mound of Beth-Shemesh was destroyed in 701 BCE (Bunimovitz and Lederman 2016, 70). Recent salvage excavations conducted immediately to the east of the tell revealed settlement activity in the later phase of the Iron Age (Haddad, Ben-Ari and De Groot 2020). Extensive olive oil production is evident from 14 olive oil presses (Z. Lederman, personal communication; Maier, Welch and Eniukhina, 2021; Gross in press). The Judahite olive orchards of the time must have sent their yields to be pressed both locally and in the central facility at Tel Miqne-Ekron.

The classic olive orchard regions in the southern Levant are the Samaria highlands and western Galilee (for recent generations, Government of Palestine 1942–1943). The archaeological surveys show that the northern part of the former region did not suffer demographic decline after 720 (Zertal 1990), while settlement activity in its southern part, closer to the border of Judah, may have deteriorated (Finkelstein and Silberman 2006a; Finkelstein 2015). The shift to large scale olive horticulture in the Shephelah in the Late Iron Age, under Assyrian hegemony, seems to have been the result of an imperial decision. Production in the highlands, away from the main arteries of the southern Levant, was not convenient. Northern regions could have supplied enough oil to Assyria itself and hence it is possible that the Shephelah industry—close to the main highway of the coastal plain—was directed at the market in Egypt.

Needless to say, not every plot in the Shephelah was devoted to olive orchards. This region was the breadbasket of Judah and certain areas must have been devoted to dry farming, to supply grain for the locals, as well as for the growing population in Jerusalem in particular and the highlands in general.

The Beersheba Valley and the Judean Desert/Oases

Expansion of settlement activity in the Beersheba Valley was closely related to the prosperity of the Assyrian-dominated Arabian trade.⁴ In the period discussed here, the main route of the Arabian trade passed along the Edomite highlands and then led, via the Beersheba Valley, to the Mediterranean coast. Buseirah in the highlands of Edom was probably the centre of Assyrian administration in the region, featuring Assyrian style architecture (e.g., Bennett 1982). The forts at Ein Hazeva and possibly Khirbet en-Nahas, seemingly garrisoned by local people including Judahites (Na'aman 2001), guarded the sector of the road where it crossed the Arabah Valley.⁵ Remains of massive Iron Age brick architecture discovered in the area of the Bedouin market in modern Beersheba (Fabian and Gilad 2010) may hint at the existence of an Assyrian centre aimed at administering the valley. The fort at Kadesh-Barnea, which was also manned by locals, including Judahites (Naaman 2001), may have served to block the western Arabian trade route, which led via north-eastern Sinai, and which was too remote (in the 'deep' desert) for the Assyrians to control efficiently. In view of these observations, it is reasonable to suggest that the Beersheba Valley economy was 'specialised' in services given to those who moved along the Arabian trade route. The inhabitants of the Judahite towns, such as Tel Ira and Tel Beer Sheva, could also have engaged in animal husbandry and opportunistic dry farming (the latter based on the precipitation in a given year). But they were not dependent on the grain from their vicinity; at least in dry years grain must have been supplied by other regions of the kingdom, such as the Shephelah.

Parts of the Judean Desert, such as the Buqeah Valley, could also have been exploited for opportunistic dry farming (for sites there, see Cross and Milik 1956). More important, the southern Jordan Valley and Dead Sea area—specifically, the oases of Jericho and Ein Gedi—were devoted to the cultivation of the Judean date palm and possibly exotic plants for the perfume industry such as the balsam tree. These crops require a special habitat, characterised by high temperatures and very low humidity.

The archaeological evidence points to the cultivation of date palms in this area since the Chalcolithic period (Zohary and Spiegel-Roy 1975). The Bible refers to Jericho as 'the city of palms' (Deut 34:3) and draws a connection between Ein Gedi and palms (2 Chr 20:2).⁶ By the 5th century BCE, Herodotus singles out the 'Syrian' date (probably referring to the Judean variety) as being of the highest quality, with storage capability (*Histories* 2.6.2); the latter quality must have added to its economic utility and trade value. Theophrastus, writing at the end of the 4th century BCE remarks (*Historia Plantarum* 2.6.2, 5, 8) that Coele-Syrian palms grow at the lowest part of the valley which extends from Syria to the Red Sea, where the soil is salty and where they are watered by the abundant natural springs. There can be little doubt that he refers to the area of Jericho and Ein Gedi. Theophrastus too notes the storing quality of these dates.

The question of cultivation of exotic plants such as the Balsam for the perfume industry in this region is more enigmatic, since no botanical remains of such plants have been found. The balsam is frequently listed by ancient authors alongside the date palm as being a significant agricultural product unique to the Dead Sea area.⁷ Especially noteworthy is Theophrastus—because of his specific interest in botany and for being the earliest among these authors (4th to early 3rd century BCE). Considering the data presented

above for the Judah-Arabia connection, the Assyrian Century is the most logical pre-Theophrastus time to be measured for the introduction of large-scale cultivation of exotic plants to the region. We therefore suggest that Assyria made the oases of Jericho and Ein Gedi centres for cultivation of the globally appreciated Judean date palms and exotic plants that were brought from Arabia.

Another unique product of the Dead Sea region is bitumen⁸. This key resource could have been exported to Egypt by the coastal trading route.⁹

Discussion

Based on the data presented above we suggest that the economy of Judah was transformed under Assyria (and initiated by the empire) from traditional Mediterranean subsistence to a sophisticated, region-based, specialised economy. As a compliant vassal, Judah benefited from the opportunities offered by the globalised economy of the empire.¹⁰ The empire influenced every aspect of life in the kingdom; this can be observed in privately owned objects such as seals (Winderbaum 2012), in architecture (Ussishkin 1995; Gadot and Bocher 2017), in cult and religion (e.g., Ornan 2005), in the composition of texts (e.g., Van Seters 1990), and perhaps most important, in administration.

The stage-setting for these developments was the unique geographical background of Judah, which is characterised by varied topography and climate on the one hand and access to international roads in the south and west on the other.

Under Assyria, the kingdom exploited each of its special ecological niches in an optimal way. Cultivation in the highlands west of Jerusalem specialised in viticulture and judging from the palynological record of the Dead Sea (Finkelstein and Langgut 2018), this must also have been the situation in the Judean hill country south of the city. The plateau of Gibeon to the north of the capital was probably devoted to grain growing and (in part) to viticulture. At least a portion of the viticulture operation northwest, west and southwest of Jerusalem seems to have been practiced in royal estates (Finkelstein and Gadot 2015).

The Shephelah was divided between dry farming and olive orchards aimed at the oil industry. The latter was managed by the Assyrians, with production directed mainly at Egypt.

The economy of the Negeb (Beersheba Valley) towns and forts was based on services given to the transportation of goods along the Arabian trade route—protection of movement along the southern fringe of Judah and providing supplies to travellers passing through. Several archaeological finds back this description, among them the khan unearthed at Aroer (Thareani-Sussely 2007), South Arabian inscriptions discovered at this site (Thareani 2011, 228; and in Jerusalem—Shiloh 1987); and reference to the ‘towns of Judah’ in a south Arabian inscription dated to c. 600 (Lemaire 2012), probably echoing a situation which started before, during the Assyrian Century. In the biblical text, the participation of Judah in the Arabian trade under Assyrian hegemony is probably represented by the tale of the Queen of Sheba’s visit to King Solomon in Jerusalem (Finkelstein and Silberman 2006b, 167–71).

The economy of the Judean Desert focused on animal husbandry and the opportunistic growing of grain in the Buqueiah Valley. More important to the economy, however, was the date palm industry and (possibly) growing balsam in the Ein Gedi and Jericho

Oases. The qualities of these plants are clear: the former a delectable (and, perhaps more important, storable) fruit; and the latter a fragrant medicinal resin. Based on historical sources, the Judean dates and balsam attained world reputation no later than the middle of the first millennium BCE, and it is only logical to suggest that the origin of this phenomenon was in the Late Iron Age under Assyria. Bitumen is another unique product of the Dead Sea region that could have been exported via the coastal trading route.

The unique economic system of Judah in the Assyrian Century and thereafter, until the destruction of the kingdom, may explain some of the most characteristic features of material culture of the kingdom, as well as the historical background of a key biblical text.

The first is the system of seal impressions and incisions on handles of storage jars, unique to the Southern Kingdom. We refer to the early *lmlk* impressions of the late 8th century, the late *lmlk* impressions of the early 7th century, the concentric incisions of the 7th century and the rosette impressions of the late 7th century and early 6th centuries BCE (Lipschits, Sergi and Koch 2011; Lipschits 2018). Scholars proposed that this system was related to the Assyrian rule over Judah (e.g., Lipschits, Sergi and Koch 2010, 7). Yet, of all the Levantine kingdoms that were under Assyrian domination, Judah is the only one where such impressions/incisions appear. Above we demonstrated the unique, sophisticated specialised economy of Judah under Assyria. This system seems to have stimulated the development of advanced administration, including the collection of liquid commodities (wine, oil and other beverages) as tax to be paid to Assyria and support of the palace and temple in the capital. No less important, in a situation of risky specialised economy, resourceful control over the products insured quick reaction in times of crisis, such as sudden droughts. The development of a unique specialised economy—not known in other kingdoms in the region—and singular system of impressing storage jars can hardly be seen as coincidence; the impression/incision system was probably connected to the control over the economy of the kingdom. The system of weights, also unique to Judah (Kletter 1998) is probably another manifestation of the particular specialised economy of the Southern Kingdom.

Another obvious feature of the material culture of Judah between the late 8th and early 6th centuries BCE is the dramatic dissemination of writing, which is especially expressed in the large number of ostraca and inscribed bullae (Faigenbaum-Golovin et al. 2016; Shaus et al. 2020; Finkelstein 2020). Most Judahite ostraca were found in the arid part of the kingdom, in the Beersheba Valley (e.g., Naaman 2015). Yet, Edom and Moab, also characterised by arid areas, did not produce a similar number of ostraca. Today, bullae are identified in wet sifting, which is practiced in Israel but seemingly not universally in Jordan. Still, even before the introduction of this method, the number of bullae in Judah was far larger than in other kingdoms in the region. This phenomenon too—the expansion of writing in the administration of the kingdom—unparalleled in the neighbouring kingdoms, may be at least partly connected to the unique structure of the specialised Judahite economy. The risky system demanded organisation of markets, transportation and exchange and thus sophisticated bureaucracy.

On the side of the biblical text, attention should be given to the list of towns of Judah in Joshua 15. The towns are grouped according to the kingdom's four geographical areas: Negeb (Beersheba Valley), hill country, Shephelah and desert (Judean Desert). In modern scholarship, the list is interpreted as depicting the administration of the kingdom in the days of King Josiah, in the second half of the 7th century (Naaman 1991). Yet, we should

ask: why is the time of Josiah depicted and not the days of Manasseh in the first half of the 7th century, the peak period of Judah under Assyrian domination? The affiliation of the list with the days of Josiah is based mainly on the archaeology of sites mentioned in it, which seem to have been established in the Iron IIC (Josh 15). Yet, the Iron IIB/C transition occurred sometime in the first half to the middle of the 7th century, meaning in the time of Manasseh. And even if the composition comes from the days of Josiah, the organisation of the kingdom into districts, emphasising its geographical division, must have been put in place in the Assyrian Century in the history of Judah, and related to the unique specialised economy of the kingdom at that time.

Summary

Late Iron Age Judah features several unique phenomena among the territorial kingdoms of the southern Levant, stemming from each other:

- The geographical background: Division into four distinctive regions, described in the Bible as highlands, Shephelah, Negeb (the Beersheba Valley) and Desert (the Judean Desert and shore of the Dead Sea).
- Economic specialisation in these regions, focusing on viticulture in the highlands, olive oil industry in the Shephelah, services to the Arabian trade route in the Beersheba Valley and a date and (possibly) exotic plant industry in the oases of Jericho and Ein Gedi; with animal husbandry and dry farming practiced in all niches.
- Advanced administration apparatus, which could oversee centralised storage and distribution of agricultural products; this system is represented by seal impressions and incisions on handles of storage jars, inscribed bullae, inscribed weights, and the dramatic expansion of literacy far beyond the capital of the kingdom.

The geographical background is a given; but it was not exploited in the same way in the early days of Judah, in the Iron IIA. The transformation of the kingdom from typical mixed Mediterranean subsistence agriculture to high-risk/high-gain specialised, region-based economy, which called for the development of elaborate administration, was an outcome of the incorporation of Judah as a vassal into the Assyrian global economy, in fact probably an initiative of the empire.

Notes

1. In "settlement patterns" we refer to sedentary activity; it goes without saying that the Beersheba Valley and the Judean Desert were also inhabited by pastoral nomads.
2. For the City of David, see Szanton 2013; For el-Burj, De Groot and Stern 2015; for Abu Shawan, Baruch 2007; for 'Alona, Weksler-Bdolah 1997.
3. Studies of pollen in the Dead Sea do not testify for the Shephelah olive industry, because pollen grains do not pass the barrier created by the massive block of the Judean Highlands (Finkelstein and Langgut 2018). Mid-Late Holocene palynological records west of the watershed are not available. Identification of charcoal assemblages from sites in the Shephelah is also challenging, since in most cases Iron Age strata were grouped together without attention to the sub-phases of the period (Lipschitz 2007).

4. Needless to say, transportation of Arabian goods to the Levant via the desert commenced in earlier phases of the Iron Age if not before. This is best evident by the site of Kuntillet 'Ajrud, dated to the first half of the 8th century BCE.
5. For the date of the fort at Khirbet en-Nahas, see different opinions in Levy et al. 2004; Levy et al. 2016, 893–920 versus Finkelstein and Piasezky 2006.
6. Today date palms are artificially pollinated. Once the yellow dust from a male date palm is shaken above the flowers of a female tree, the fruit yield increases. It seems that the Assyrians had already been aware of this method: a relief in the palace of Ashurnasirpal II shows a winged god dusting palm flowers with pollen; a similar motif is repeated in a number of other Assyrian reliefs.
7. Theophrastus, *Historia Plantarum* 9.6.1–4; Diodorus *Bibliotheca Historica* 2.48.9, 19.98; Strabo *Geographica* 16.2.41, 17.1.15; Pompeius Trogus [apud Justin] *Historiae Philippicae Epitoma* 36.3.1–7; Dioscorides, *De Materia Medica* 1.19.1; Pliny *Naturalis Historia* 12.111; Tacitus *Historiae* 4.6.1. Josephus says that it was introduced to the region as a gift to King Solomon by the Queen of Sheba (Ant 8, 6, 6).
8. In the Near East, bitumen can originate from five major areas: the city of Hit and surroundings and Mosul in modern Iraq, the area of southwestern Iran, the Dead Sea (Connan and Van de Velde 2010) and Abu Durba and Gebel Zeit on the shores of Egypt's Gulf of Suez (Harrell and Lewan 2002). Natural asphalt from the Dead Sea could be gathered from the deposits on the shore of the lake or occasionally during periods of intensification in seismic activity, when it was found floating on the water surface.
9. Though the Gulf of Suez seeps were much closer to Egypt, it seems that the ancient Egyptians favoured the Dead Sea bitumen. This is perhaps due to its semi-solid nature, which enabled it to be more portable. Additionally, the Dead Sea area was linked to Egypt by a well-established coastal trading route, whereas bitumen from the Gulf of Suez would have to be brought either across the rugged mountains of the Eastern Desert or up the Gulf of Suez by a circuitous route as long as the direct one from the Dead Sea (Harrell and Lewan 2002).
10. For the impact of Assyria on Judah, see, e.g., Naaman 1995; Thareani 2016; Koch 2018. Contra, e.g., Stager 1996; Faust 2021 who contested this notion.

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