

Bedrock Installations Used and Reused Outside Tel Burna

Casey Sharp, Ladislav Šmejda, Chris McKinny, Kathleen Nicoll,
Andrea Orendi, and Itzhaq Shai

Abstract

In the summer of 2015, the Tel Burna Excavation Project in Israel opened Area C, with the goal of better understanding the adjacent agricultural areas. During the 2015 and 2016 seasons, installations of various sizes and shapes were found carved out of the limestone bedrock. Although some Byzantine and Persian occupation is known at the site, survey results from this area demonstrate the predominance of Bronze Age occupations and Iron Age II finds concurrent with excavated areas on the tell. Rock-cut installations revealed exclusively Bronze and Iron Age finds. Finds on the limestone bedrock surface included basalt grinding stones, flint blades, and several incomplete ceramic vessels from the Late Bronze IIB and Iron Age II. Although the lack of architecture and stratified contexts obscures an exact dating, ceramic finds suggest that these agricultural installations were used and reused throughout the occupation of Tel Burna. The results from Area C provide insights into the agricultural economy of the Bronze and Iron Age Shephelah.

Keywords: Tel Burna, bedrock installation, agriculture, Bronze Age

Mr. Casey Sharp – Independent Scholar, caseysharp@gmail.com

Prof. Ladislav Šmejda – Department of Anthropology, University of West Bohemia in Pilsen, and Department of Applied Geoinformatics and Spatial Planning, Czech University of Life Sciences Prague, The Czech Republic, ladislav.smejda@me.com

Dr. Chris McKinny – Texas A&M University Corpus Christi, chrismckinny@gmail.com

Prof. Kathleen Nicoll – Department of Geography, University of Utah,
kathleen.nicoll@gmail.com

Dr. Andrea Orendi – ArchaeoConnect GmbH, Archaeobotany Team, Tübingen, Germany, orendiandrea@hotmail.com

Prof. Itzhaq Shai – The Institute of Archaeology, Ariel University, Israel,
shai.itzick@gmail.com

Introduction: Archaeological Context*

Tel Burna is a multi-period archaeological site located in the Lower Shephelah (Fig. 1) of southern Israel. The Shephelah has been characterized by agricultural production in both ancient and modern times. Thus, the archaeological investigation of Tel Burna offered a unique opportunity to study ancient agricultural production, economic exchange, and national/ethnic identity (Riehl and Shai 2015; Shai 2017). During the Bronze Age – and particularly the Late Bronze Age – the site was at the crossroads of trade routes between the coast and the hill country. Its importance in this economic network is attested by the discovery of luxury items flowing from Cyprus into Canaan. Late Bronze cultic activity at the site shows some evidence of hybridization from this cultural and economic exchange, such as a mixture of Egyptian and local Canaanite motifs (Sharp, McKinny, and Shai 2015; Shai, Sharp, de Freitas, Cassuto and McKinny 2018). In addition to cultural exchange and the distinct identification of luxury items, agricultural products from the site would have been traded to the coast and inland to the hill country. During the Iron Age, the site, possibly the biblical Levitical city of Libnah, was a fortress on the front line of Judah's territory bordering the Philistines and Tell es-Safi/Gath (Shai 2017). Besides serving the economic needs of this fertile hub, the routes around the site facilitated travel for trade as well as for invasion by armies, such as the well-documented Neo-Assyrian conquest during the reign of Sennacherib (McKinny and Dagan 2013).

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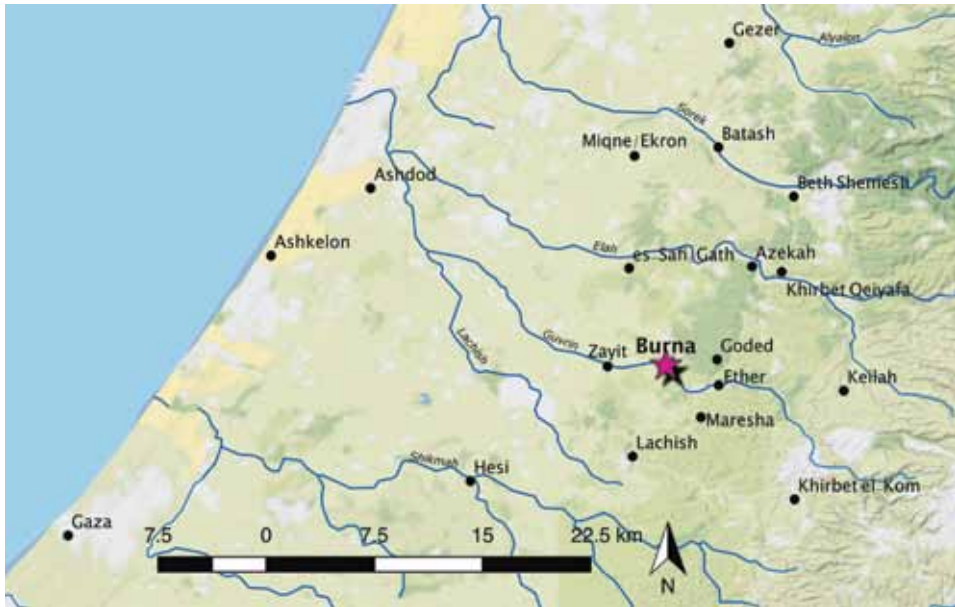


Figure 1: Tel Burna in the Shephelah (The Tel Burna Archaeological Project)

Located along the northern banks of Nahal Guvrin, this area of the Shephelah has been part of the breadbasket of the region for thousands of years. To this day, there are cultivated fields along the wadi adjacent to the site, while the site itself is within the confines of a fertile cow pasture. Tel Burna contains evidence of occupation from multiple periods from the Early Bronze Age through the Byzantine period. Thus far, the primary excavation areas (Fig. 2) have uncovered Late Bronze IIB (i.e., 13th century BCE) remains in Area B1 (Shai et al. 2018) and Iron Age II remains in Areas A1, A2, and B2 (Shai 2017). After the Neo-Assyrian conquest in 701 BCE, the casemate wall of the Judahite fortress was apparently no longer in use. Multiple silos were carved out of the inner wall during the Iron Age IIC (Shai et al. 2014). One silo alone yielded 16 different crop taxa (Riehl and Shai 2015; Shai 2017). Another silo yielded three different stamp seals on storage jar handles from the preceding Iron Age IIB, including a LMLK, a rosette, and a private seal impression (Shai et al. 2014). Some Persian occupation was also uncovered on the summit of the tell (McKinny and Dagan 2013).

Initial surveys of the site and excavations of deposits in Area B1 attest to the occupation in earlier periods, including the Early and Middle Bronze Age (Uziel and Shai 2010).

Until these earlier periods are excavated on the tell proper, the agricultural area to the northwest of the tell (Area C) offers a glimpse into the earliest periods of occupation. Area C also reveals insights into the local industry and economy during the Late Bronze and Iron Ages, as it contains a number of bedrock-cut installations that were used over multiple time periods for various purposes.

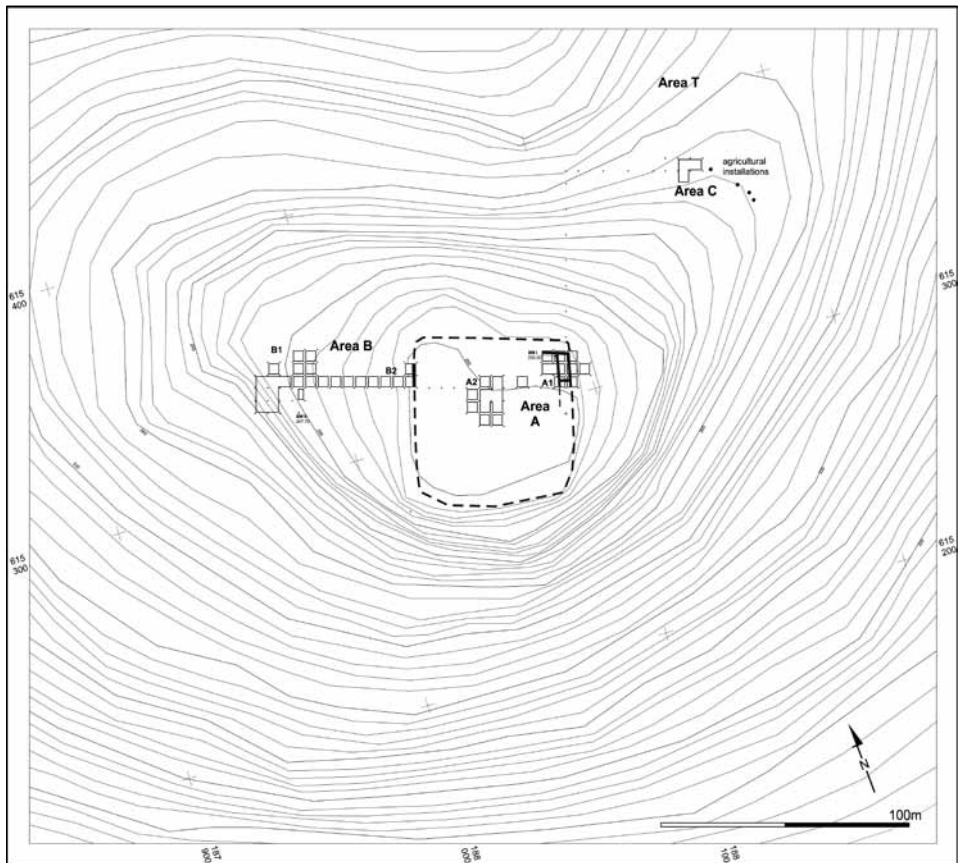


Figure 2a: The excavation areas of Tel Burna (Jay Rosenberg)



Figure 2b: Aerial view of the excavation areas of Tel Burna (Griffin Aerial Imaging)

The Geological Setting of Area C

The site is located on a bedrock knoll, with Areas B1 and B2 extending west of the tell and Area C positioned on a lower outcrop of the local bedrock, approximately 200 m northeast of the tell (Fig. 2). Tel Burna is located in a region characterized geologically by white, chalky Eocene limestone, which created easily traversable east-west routes following the natural physiography marked by bedrock erosion and stream incision, as in Nahal Guvrin (Ackermann 2007). This larger geographic extent of chalk bedrock is mapped as the Maresha member of the Zor'a formation (Buchbinder 1969), continuing to the east toward the Judean Hills, where the relief is controlled by more crystalline limestone bedrock. The dominant landscape features in the Shephelah largely consist of Eocene limestone, which produces a thick *nari*, a hard calcrete crust in the upper part of the chalk, usually at a depth of 1–3 m below the surface (Itkin, Geva-Kleinberger, Yaalon, Shaanan, and Goldfus 2012; Olsvig-Whittaker et al. 2015). *Nari* was used for construction of buildings as well as in agricultural terracing (Ackermann, Svoray, and Haiman 2008), which was not exclusive

to the beginning of the Iron Age but increased markedly at that time (Shiloh and Horowitz 1975). Nari limestone is common, somewhat soft, and cheap to quarry, and it breaks along 90-degree angles; this makes it an easily attainable building material that can be easily worked. Moreover, due to the lack of harder limestones in the Shephelah, it is the only reasonable material for construction.

Because it can be worked rather easily, the smooth, soft limestone chalk of the Shephelah is ideal for carving installations and quarrying stone. It contains relatively few inclusions, unlike the limestone farther to the north on the Carmel ridge, which has many intercalations of basalt and calcite veins (Cohen-Weinberger 2007). Limestone outcrops vary in thickness, and hollowed-out areas beneath the bedrock allowed for the formation of extensive networks of caves: natural ones, man-made ones, and natural ones further carved out by human activity (particularly in the Hellenistic-Roman period). One example of these limestone caves can be seen at ancient Maresha/Marissa, just a few kilometers to the east of Tel Burna; this area has an extensive network of bell-shaped caves connected by a series of tunnels that were widened by natural dissolution of the limestone or hand-cut (Kloner and Zissu 2013).

The chalk-rich limestone bedrock and caves provided the means for a combination of activities in a single area. Tombs and burial places are located next to agricultural production centers utilizing the bedrock. The limestone caves near Area C were probably used as tombs from at least the Late Bronze through the Byzantine period (Amos Kloner, personal communication). All of the tombs known to the excavators were robbed in antiquity; no intact tombs have been found in the area. Various caves and tombs from multiple periods are located in the immediate vicinity of agricultural installations from the same periods. The inhabitants of Tel Burna did their daily agricultural work in direct spatial relation to the graveyard of their families and ancestors; this configuration of the cultural landscape resulted from the regional geology.

The Extensive Settlement of the Late Bronze Age

The lower plateaus of Tel Burna were utilized extensively during the Late Bronze Age. The most significant area investigated thus far extends out from the west of the tell. It

comprises Area B1, including remains directly atop bedrock less than 5 cm below topsoil dated to the 13th century BCE (Shai, McKinny, and Uziel 2015; Shai et al. 2018). The dense concentration of Late Bronze IIB architecture and finds related to the religious and ritual life of the site contrasts with the broader lower plateau north-northeast of the tell (Figs. 2a–2b).

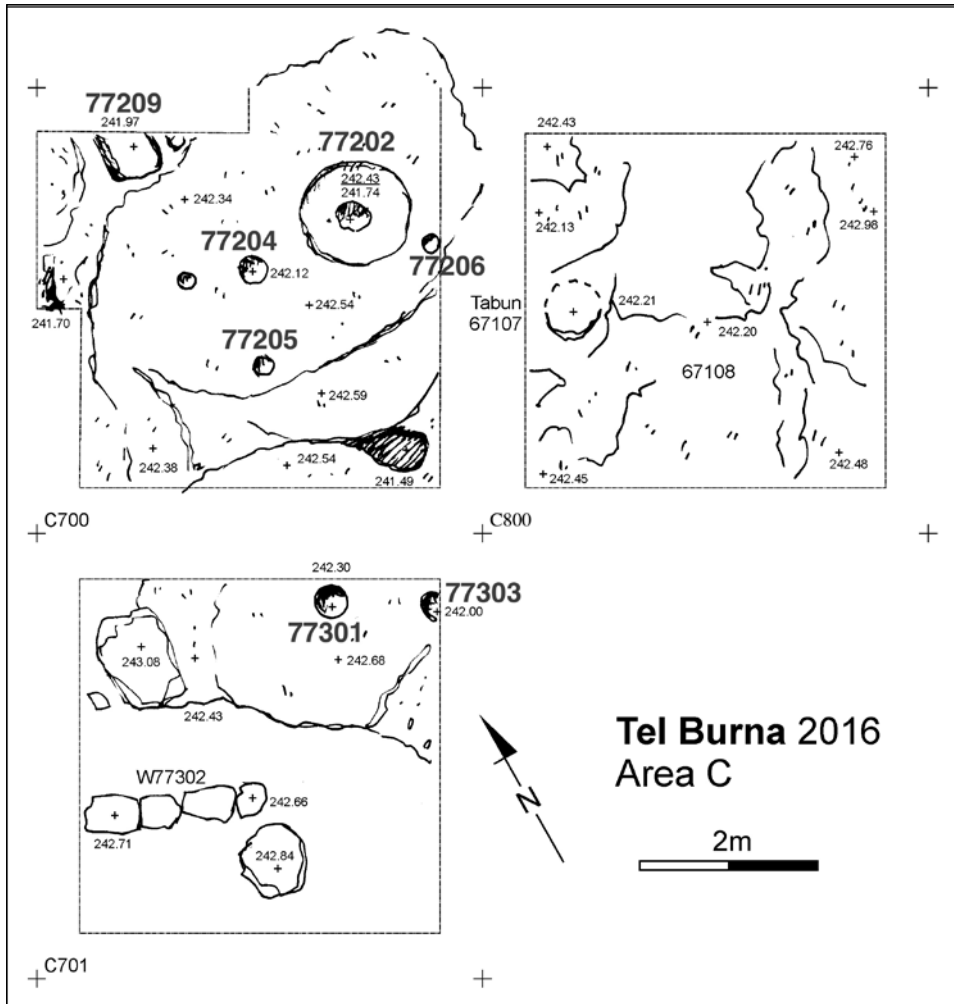


Figure 3a: Tel Burna Area C (Jay Rosenberg)



Figure 3b: Aerial view of Area C (Griffin Aerial Imaging)

Area C has none of the architecture or high concentration of luxury items in Area B1, but Late Bronze finds still dominate this area. The second-largest number of finds come from the Iron II, and so far they largely correspond with the Iron Age II finds uncovered on top of the tell in areas A1, A2, B2, and G. However, both the Iron Age II and Late Bronze II are clearly present in Area C. The third-largest number of ceramic finds come from the Middle Bronze IIA, while other sherds can be dated to the Middle Bronze II and Early Bronze Age (Fig. 4). There is also at least one definitive piece of a Chalcolithic cornet from Square 700 (Fig. 3).

Area C contained very few faunal remains, which implies that the area was not used for domestic refuse or ritual purposes as Area B1 was (Shai, McKinny, and Uziel 2015). Indeed, this relative lack of faunal finds contrasts greatly with Area B1 and its high concentration of faunal remains from the Late Bronze II (Greenfield, McKinny, and Shai 2017). Rather than a ritual center, Area C was a utilitarian workplace for agricultural or other production activities, attested by a fairly large number of flint tools and fragments of basalt grinding stones recovered there. No architectural remains were discovered except for a small portion of a stone wall, which may have been a part of an agricultural terrace (Fig. 3a).

As in Area B1, the finds in Area C are located directly below topsoil in places where erosion has not left the bedrock completely exposed. Luxury items are rare in Area C, despite the moderately high concentration of Late Bronze finds, which typically include Cypriot imports in other functional contexts. Two fragments of chalices have been found (Fig. 4: 2–3), but the broken top of a chalice could also have been used to scoop out olive oil or some other liquid. Aside from this possible outlier, Area C contains none of the ritual items found in Area B1; nor does it have any imported Cypriot wares or local imitations of them. At Tel Burna during the Late Bronze, Area B1 was a populated ritual area of the site, while Area C has all the characteristics expected of an agricultural processing zone outside the main occupational area of the site, which was presumably located on its upper plateaus.

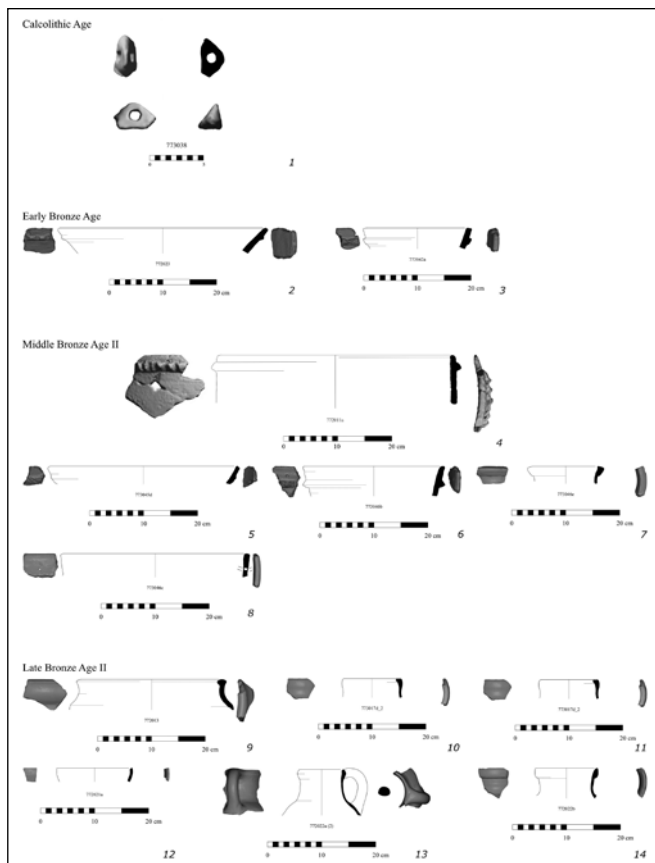


Figure 4: Ceramics from the Chalcolithic to the Late Bronze Age II

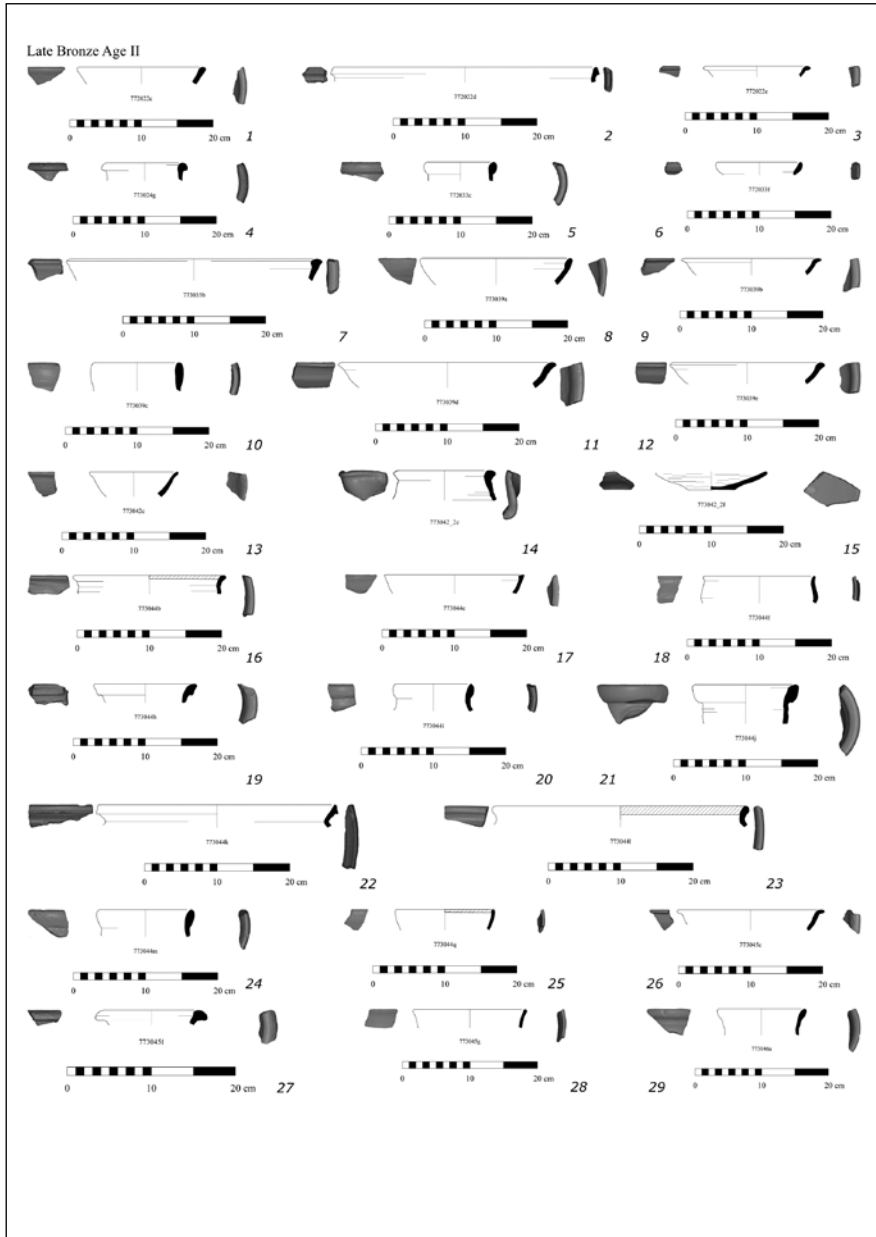


Figure 5: Late Bronze Age II ceramics

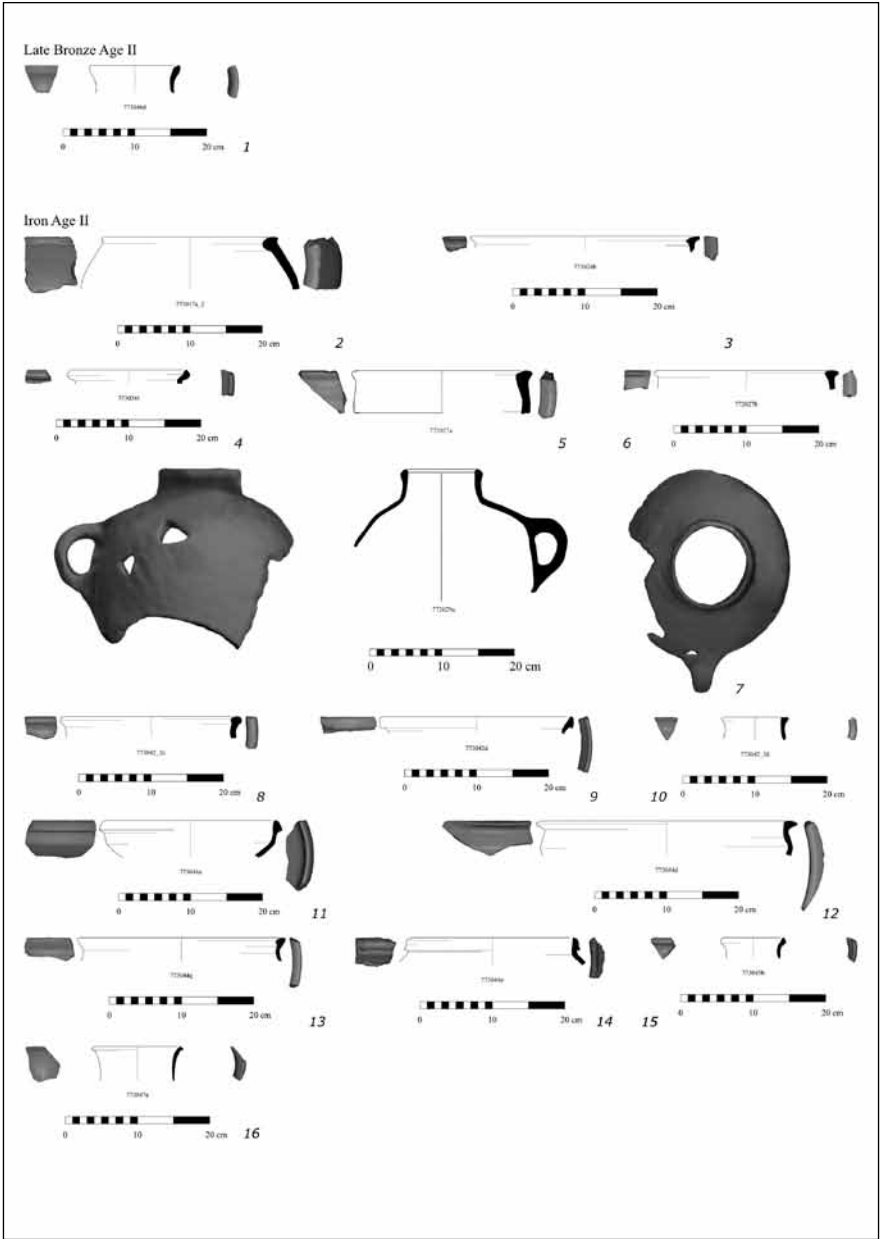


Figure 6: Ceramics from the Late Bronze Age II to the Iron Age

Bedrock Features

Bedrock features in the vicinity of the tell provide insights into aspects of agricultural production and trade. The two most common Bronze and Iron Age installations in the Shephelah region are cup marks (כּוּפּוֹת)¹ and shallow installations. Used for wine and oil production, these usually consist of a shallow basin for pressing grapes or olives, connected to a small channel through which the liquid would flow into a larger vat carved out of the bedrock (Eitam 1987; Katz 2008: 35). These pressing installations are known to have been used from the Iron Age II onward. They can be differentiated from the simpler rock-cut installations associated with earlier periods in Area C, which are found either directly on the surface or buried 10–30 cm below the topsoil. Indeed, Area C was selected for excavation due to the discovery of a concentration of earlier ceramic finds in the course of an initial surface survey of the site, as well as the visibility of agricultural installations on the surface (Uziel and Shai 2010).

Considering the relative ease of carving Tel Burna's soft limestone, it is clear that the bedrock installations received their shape and depth from both deliberate production and accumulated use over long periods of time (Van den Brink 2008; Rosenberg 2017). An excellent example of this in Area C is the large circular installation 77202 located in the northwest corner of Square 700 (Fig. 3a), which measures 1.25 m in diameter and 0.85 m deep. This installation, which could have held nearly 250 liters, was visible in the initial survey of the site, and its presence provided extra impetus for excavating Area C. An installation of this size was probably formed by a combination of initial hewing, erosion from continual use, and a degree of natural erosion.

1 Cup marks were used since prehistoric periods. For a review and definition, see, e.g., Katz 2008: 35; Welch 2015: 14.



Figure 7: Ancient winepress in Ein Kerem, Israel, early 20th century (from Matson Collection, © Todd Bolen/BiblePlaces.com)

The small circular installation 77205 (diameter of 0.2 m and depth of 0.15 m), directly southwest of 77202, contained exclusively Middle Bronze IIA pottery. Specifically, sherds were rejoined to reveal part of a very large cooking vessel (Fig. 4: 1), and another sherd made of identical material may have been part of the body of that same vessel. It appears that this installation was used exclusively in the Middle Bronze IIA. Interestingly, however, this small installation contained only pieces of a Middle Bronze IIA vessel, while Late Bronze and Iron Age II ceramics rested atop bedrock in its immediate vicinity, and presumably the inhabitants in those periods used the much larger adjacent installation.

Area C slopes down steeply at the western end of Square 700 and just outside the western perimeter of Square 701, with an elevational relief of up to 2 m. Therefore, several Iron Age II ceramics, including the top of an Iron II jar, were found at a lower elevation than the predominantly Late Bronze II ceramics on the flatter plateau above (Fig. 7: 6).

The abundance of ceramics weathering out of primary contexts down the slope, as well as a singular rectangular installation located along the edge of the slope (Fig. 3; 77209), led us to extend the borders of Square 700 in the northwest to fully reveal this installation and collect materials that may have eroded downslope from primary contexts.

None of the numerous bedrock installations in Area C are clearly identifiable as Iron Age olive presses (but see Katz 2008: 36 and Tavger 2018: 404, who suggest that winepresses doubled as olive presses). Such readily identifiable installations use a shallow crushing or pressing surface above a circular basin, which collects the olive oil, usually via a small channel connecting the two basins (Eitam 1979). There seem to be other installations on the surface in this area northeast of the tell, but their exposure and lack of earlier ceramics make it difficult to correlate them specifically with earlier periods as opposed to later ones. Winepresses in the Byzantine period were of similar construction. Byzantine remains were also observed in the survey; one example is clearly visible directly east of Area C (Fig. 3b). However, one should be careful in assigning use, as olive oil production and wine production often occurred next to one another in the Iron Age II, and installations were often multi-purpose (Eitam 1987; Franklin 2004).

Combined archaeobotanical evidence and a taxonomy of installation shapes can provide some indication of use across multiple periods. Four soil samples from the area in and around the installations in Square 700 yielded 20 cultivated seeds with barley (10%), cereals (20%), and cultivated legumes (15%), as well as some wild species also found in other areas of the tell, such as stoneseed, trefoil, wild grasses, and *Thymelaea sp.* This spectrum reflects what we would expect at an agricultural site from the Bronze or Iron Age (Orendi et al. 2017). However, the relative absence of botanical evidence may also provide some insights. Since none of the currently excavated installations can be clearly identified as olive presses, they may have had other uses.

The only general observation that can be made about the use of bedrock installations based on shape without clear archaeobotanical or other evidence is that circular installations were used predominantly for liquids, while rectangular installations were for processing grains and cereals (Rosenberg 2017). Area C has only one rectangular installation (77209). Although it may have been used for grains, the six circular installations are ambiguous, and this fact leaves other possibilities open. When Albright excavated a number of circular

installations at Tel Beit Mirsim, he identified them as “dye-plants” in connection with the loom weights found at the site (Albright 1943). However, this identification was later challenged by Eitam (1987) due to the presence of the previously mentioned pressing surfaces, which were doughnut-shaped and clearly associated with production methods for olive oil. Indeed, several concentrations of loom weights from multiple periods have been found on Tel Burna (McKinny, Yang, Cassuto, and Shai 2018). This is unsurprising, but we should be open to the possibility that some or all of these installations may have been used for the production of agricultural products other than foodstuffs, such as leather or textiles. Knowing this will help us widen the scope of our search for evidence of all modes of production at Tel Burna.

The diversity of installation sizes, depths, and shapes, as well as the time periods present in recovered ceramics, suggests varying uses for the area across multiple time periods. The inhabitants apparently needed a rectangular installation (77209), small and shallow circular installations around 0.2 m in diameter (77204–77206), small installations up to 0.5 m deep (77301, 77303), and a very large and deep installation (77202) that could hold nearly 250 liters, all in the same area. These various installations may have been in use at the same time, especially during the Late Bronze Age, which accounted for the highest concentration of ceramic finds across the excavation area.

Conclusions

The survey and excavations in Area C and the rest of the site have expanded our understanding of the economy of Tel Burna. The circular bedrock installations in Area C may have been used for various purposes in multiple periods; their main function was probably processing liquid products. The installations may have been used for olive oil in the Bronze Age prior to the adoption of the more formalized olive press structure during the Iron Age in the southern Levant, or they may have been used for other purposes such as the production of vegetal dyes. Viticulture is another option. It was abundantly practiced in the area in the Byzantine period, but is thought to have been widespread in the region since ancient times (Frankel 1997). Indeed, earlier installations may have been reused

in the Byzantine period, although a dearth of Byzantine ceramics in Area C suggests a general lack of Byzantine reuse there. The area near Tel Burna was used for industry and burial – side by side. However, there is little evidence of any domestic settlement on this northeastern plateau extending out from the tell. The area was used similarly in the Middle Bronze II, as we know both from the ceramics in 77205 and from other Middle Bronze II finds. Area C may have also been used in the Chalcolithic and Early Bronze Age. Grain products may have been processed in at least one rectangular installation, and archaeobotanical remains record some of the staple products of the region. With such a high concentration of Late Bronze Age II and Iron Age II finds, as well as earlier finds adjacent to installations in a small area, future excavation should provide a more complete picture of agricultural production at Tel Burna. As has been noted in the past (see, e.g., Welch 2015: 37, where he discusses the installation at Beit Shemesh), more complicated, advanced olive presses became common in Judah in the late eighth century BCE.² At Tel Burna, the installations are of the simpler, more traditional variety common outside of the cities. Furthermore, silos (for grain) were commonly used at Tel Burna in the Late Iron Age IIC (Shai 2017: 50–51). This may reflect a shift in the agricultural economy during this period, perhaps as a byproduct of the thriving oil production at Tel Mikne–Ekron (e.g., Gitin 1989; Eitam 1996: 169).

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2 Faust (2017: 20–23) claimed there was a similar practice in the Northern Kingdom in the ninth and eighth centuries BCE, but see also Tavger 2018: 407–408 for a critique of this conclusion.

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