REEEVALUATING EARLY BRONZE I TELL ES-SULTAN 
IN THE SOUTHERN JORDAN VALLEY 
IN LIGHT OF RECENT SETTLEMENT PATTERN STUDIES

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The main goal of this paper is to reanalyze settlement distribution that developed along the Jordan Valley during the Early Bronze Age and to frame Tell es-Sultan with its unique ecological niche in this wide and heterogeneous panorama. The study of enrooted relationship between sites and environment - in light of most recent excavation and survey data - confirm the fundamental and well-known role played by water in the settlement organization.

Keywords: Jericho; ‘Ain es-Sultan; Early Bronze Age I; Jordan Valley; spatial analysis

1. ENVIRONMENTAL SETTING

The Southern Jordan Valley, located between the hilly area of Samaria to the West and the Jordan River to the East¹, consists of three different geographical sub-units: the Ghor, precipitous rocky banks 30 to 70 m high; the Katar hills and the Zor, namely the area in which the largest number of archaeological sites is concentrated². The Jordan Valley is characterized by numerous ecological niches in which some essentials to life factors, as springs, wadis or communication routes, have conditioned the settlements distribution also inducing communities to adapt and grow³. Despite the almost tropical climatic conditions, with the fall in annual precipitation from 270 mm in the North to 160 mm in the South, the valley shows a long occupation since the Neolithic, with village farming communities provided of a great capacity of resilience. The Early Bronze Age (henceforth EBA) represents a period during which a combination of a series of factors, like the emergence of a different subsistence economy or a more stratified society, led village farming communities to the urban city life⁴.

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* Sapienza University of Rome, Department of Sciences of Antiquity.
1 Bar 2014, 7.
3 Anfinset 2006, 62.
4 Gophna - Portugali 1988, 19; Esse 1991, 163-164; Gophna 1995, 273; Lovell 2002, 96-97; Greenberg 2014, 270; Milevski 2013, 195-198, 202; de Miroshedj 2014, 307. The change at the end of Chalcolithic Period concerned all the branches: the strategies of subsistence and storage of food, the modes of production, the transport and the circulation of goods, the contacts with surrounding and more distant regions, up to the socio-political and religious ideology.
Fig. 1 - Sites’ map based on settlements typology (after Bar 2014, fig. 6.2).
Fig. 2 - Sites' map based on settlements size (after Bar 2014, fig. 6.7).
2. Organization and Distribution of Sites

The increase in the number of sites\(^5\) is the main visible characteristic of the EB I period\(^6\) along with two other important phenomena that were: the shifting of settlements into new regions, like the course of Wadi Far’ah and the eastern foothills of Samaria, and the first appearance of fortifications, especially at the end of EB I\(^7\).

In addition to their position on hills with a cone shape and flat top, the common features of these sites are their placement on the abandoned Chalcolithic sites\(^8\), usually located near a water source, an agricultural area, or a crossroads\(^9\). A number of streams, all working as clustering and centralizing points, flow across the Jordan Valley; the most important are, from north to south: Wadi Bezeq, Wadi Malih, Wadi Far’ah, Wadi Ahmar and ’Wadi Aujjeh, Wadi Nu’eima, and Wadi Qelt\(^10\).

A renewed analysis of materials from survey and excavations operated by S. Bar\(^11\), shows about 45 sites in the area attributed to the EB I period (fig. 1); they are divided in seven different categories: unfortified, fortified, enclosures, open sites, burials, cultic sites and caves\(^12\).

The unfortified category, probably represented by rural settlements, is the most common especially in the EB IA\(^13\) and it is divided into four groups according to the site extension (fig. 2). The first one consists of four large-size sites with an area of about 10 ha (Sites nos. 55-57, 62 on map), located along Wadi Far’ah, on the wadi flood plains and in the Southern Beth Shean Valley. Thirteen medium-size sites with an average of 1-3 ha are concentrated in the western part of Wadi Far’ah and near the springs of the desert fringes of Samaria. Eight small size sites (1 ha ca.) are located near a source of water and arable land. No single structure, like nuclear family settlement, has been found for this period\(^14\).

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\(^5\) Gophna - Portugali 1988, 14-15, 19, 21; Esse 1991, 173; Finkelstein - Gophna 1993, 6-8; Joffe 1993, 46, 50; Gophna 1995, 269; Yekutieli 2001, 663; Bar 2014, 442; de Miroschedji 2014, 312. An increase of sites is noticeable during the EB IB in the coastal region if compared with EB IA, when instead a decline in population density and in the number of sites is attested; the same happens in the inland area where during EB IB there was a remarkable increase of sites and population.

\(^6\) Yekutieli 2001, tab. 33.1; Nigro et al. 2011, 572 ; de Miroschedji 2014, 308.

\(^7\) de Miroschedji 2014, 312.

\(^8\) Gophna 1995, 269; Paz 2002, 245.

\(^9\) Anfinset 2006, 62, 74; Milevski 2013, 200.

\(^10\) Zertal - Bar 2017, 18.

\(^11\) Bar 2014, 4. The analysis of S. Bar is based on previous studies (Gophna - Porath 1972; Finkelstein - Lederman 1997; Zertal 2008) and some excavations and survey data provided by Archaeological Staff Officer of the Judea and Samaria.

\(^12\) Bar 2014, 51, 96. The whole number of sites is 82, and 45 possibly belong to the EB I period (according to the numbers of diagnostic finds, S. Bar defined five levels of probability).


The fortified category consists of five sites: Tell Radgha/Tel Shalem\(^{15}\) in the Southern Beth Shean Valley (Site n. 7), er-Rjjum in the middle part of Wadi Far’ah (Site n. 43), Tell Za’anuni south of Wadi Far’ah (Site n. 42), Khirbet Juraiash (Site n. 64) and Khirbet Rahiyeh (Site n. 96). The presence of fortified sites along the whole watercourse of Jordan River is also visible on the eastern bank and it would seem to be an element of the EB IB\(^{16}\).

The other categories are represented by four open sites usually located far from the main settlement cluster, in hostile and unwelcoming areas, seven burial sites, one site devoted to cultic practices and six enclosures\(^{17}\).

The areas with the highest settlement density were the western part of Wadi Far’ah with more than half of all EB I sites, and the Beth Shean area between Wadi Shubash and Wadi Malih\(^{18}\). The sites arose on the wadi flood, on the slope and along the edge of the valley. The desert frontier of Samaria, between Wadi Malih and Wadi Far’ah, was sparsely populated, the desert frontier between Wadi Fazael and Wadi ‘Aujeh, was also very slightly settled, and finally the Jericho Oasis near the Jordan River estuary shows a scattered settlement situation.

Three main settlement clusters have been identified by S. Bar along the western Jordan watercourse\(^{19}\): Southern Beth Shean Valley, Wadi Far’ah, and Wadi Fazael; each group shows one site or a block at the center of the cluster. The key site for the Southern Beth Shean Valley was Tell Radgha/Tel Shalem; for the Wadi Far’ah region there were er-Rjjum, Tell el-Far’ah North, ’Ain Farr and the sites of the flood plain; lastly Khirbet Rahiyeh was the central site for the Wadi Fazael cluster. To complete this settlement organization there were smaller sites gravitating around the central site\(^{20}\). The distance between clusters ranged between 20 and 40 kilometers.

3. EB I SETTLEMENT PATTERN AND CHANGING FACTORS

The observed settlement distribution reflects the adaptation to environmental conditions and displays how different possibilities were exploited. As mentioned above, the two most important phenomena occurred in the region were the growth in the number of sites and the shift from the valley to the hilly western area\(^{21}\). Usually the sites on the lower altitude were abandoned and relocated to the wadi’s highland leaving free areas for agricultural purposes\(^{22}\). This change in land exploitation could be linked to the beginning of horticulture, in particular of *Olea europaea*\(^23\), possible at


\(^{16}\) Paz 2002, 238-241.

\(^{17}\) Davidovich *et al.* 2014, 882-884, 895-895.

\(^{18}\) Other settlements have been recently recognized in this area (Zertal - Bar 2017, map 18).

\(^{19}\) Bar 2014, 120-122.

\(^{20}\) Esse 1991, 161, 164-165; Bar 2014, 121.

\(^{21}\) Esse 1991, 163-164, fig. 34; Lovell - Bradly 2011, 286; Milevski 2013, 200.


\(^{23}\) Finkelstein - Gophna 1993, 14; Lovell 2002, 96-97; Milevski 2013, 199; de Miroschedji 2014, 310; Sabatini in this volume.
altitudes between 300 and 800 m with precipitation ranging from 300 to 500 mm. Moreover, this shifting of altitudinal range could turn out the effort to reach perennial springs and potential farmland that represent the focus point around which the proto-urban societies usually developed. The average distance to the water source is generally about 400 m and 217 m (GPS and a t-test), changing with settlement size. This tendency was due to the greater demand of water from EBA communities than the previous period (even if this had already been seen in the Neolithic). Study with index of dispersion of the sites demonstrated that the EB I sites were grouped together in settlement clusters not random but with water and land as centralizing factors. Increase in the number of sites is therefore symptomatic of a visible economic growth from small pastoral communities to a large agricultural organized society.

4. TELL ES-SULTAN, ANCIENT JERICHO IN THE JORDAN VALLEY LANDSCAPE

Despite its elevation and the low percentage of rainfall, Tell es-Sultan/Jericho started its urban experience early in the 3rd millennium BC, thanks to its extremely flourishing ecological niche: the oasis. The oasis raises between two wadis flowing into the Jordan River, Wadi Nu‘eima and Wadi Qelt, on the border of a limestone plateau. The closest spring is ‘Ain es-Sultan but other two are in the closeness of the site: ‘Ain el-Auja and ‘Ain Duq. The main difference in respect of these two wadis that made the fortune of ‘Ain es-Sultan was the absence of a wadi following the source, delimiting the water dispersion. Underground small canals network flow towards the Jordan River feeding the surrounding fertile plain and allowing the partial outflow.

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24 Stager 1985, 172-173; Philip 2003, 106.
26 Finlayson et al. 2011, 191, 193.
27 Bar 2014, 120-121.
29 Milevski 2013, 201. The organization and distribution of the sites seems to answer to the need of control the new landscape made of husbandry, olive and grape horticulture and cereal farming.
30 According to the site periodization the Early Bronze I/Sultan IIIa is dated to 3500-3000 BC (Nigro 2005, 197 table 2; in this volume, § 6.1., tab. 5; Nigro et al. 2011, 572).
32 Nigro 2007, 12; 2014b, 31; Finlayson et al. 2011, 197. The spring provided a great water supply with about 4,000-5,000 liters each minute allowing the growth of agriculture, animal breeding and therefore the transformation from a seminomadic to a stable society. At the beginning of the Bronze Age probably occurred the transformation of the spring in a built-up structure, but archaeological evidences are still scanty.
33 Anfinset 2006, 63.
34 Dorrell 1978, 11-12; Ron 1985, 151-152.
The EB I village of Tell es-Sultan, excavated in the north-eastern part of the site by J. Garstang during 1935-1936 seasons, and afterwards enlarged in the southern sector by K.M. Kenyon, was characterized during its first stage (EB IA/Sultan IIIa1) by a rural village with circular huts built above terrace walls; in the successive stage (EB IB/Sultan IIIa2), the Proto-urban phase, the village, still unfortified, was characterized by rectangular houses, apsidal buildings and reinforced terrace walls.

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35 Garstang - Droop - Crowfoot 1935, 149-150, 153; Garstang - Ben-Dor - FitzGerald 1936, 73-74.
37 Nigro in this volume, tab. 5.
40 Joffe 1993, 50; Parr 2000, 391-395; Paz 2002, 238, 240; Nigro 2005, 35; 2008, 647. P.J. Parr supposed the increase of settlement in this phase, while Y. Paz differently interpreted the EB II defensive structures as a first fortification of the Proto-Urban settlement.
The distribution of artifacts has proved that the village of Sultan IIIa period has extend to the southern part of the tell\textsuperscript{41}, reaching the spring\textsuperscript{42} and covering an area of about 2 ha (fig. 3). Accounting reliable the density coefficient of population proposed by R. Gophna and J. Portugali\textsuperscript{43} one could hypothesize, for EB I Tell es-Sultan, a population of about 300 inhabitants, number destined to increase with the advent of urbanization and growth of settled area in the following periods\textsuperscript{44}.

4.1. Settlement analysis of the Jericho Oasis

The reconstruction of the general settlement pattern in the Jericho Oasis is possible thanks to PADIS Project which collected all previous data about voyages and surveys in this area\textsuperscript{45}. During the Chalcolithic Period the settlement ceased to exist because of a break in the source stream or it sporadically persisted\textsuperscript{46}. It seems that the site moved northward in the direction of the other two springs\textsuperscript{47}; other sites in the oasis were Tell el-Ma'far\textsuperscript{48} on the northern shore of Wadi Nu'eima, Tell Abu el-\textsuperscript{2}Alayiq South\textsuperscript{49}, key site of the whole area, and some caves along the Jebel Quruntul and the cliff of Abu Saraj.

The settlement pattern of the Chalcolithic Period, with the addition of Tell Abu el-\textsuperscript{2}Alayiq North\textsuperscript{50} before not occupied, continues throughout the EB I up to EB II with a few sites to populate the area (fig. 4). The stable settlement at Tell es-Sultan (Sultan IIIa) is also witnessed by the use of the nearby necropolis\textsuperscript{51}. The presence of a simple terracing wall delimitating the early settlement allows to include Tell es-Sultan in the group of unfortified sites\textsuperscript{52}, and only at the beginning of EB II\textsuperscript{53}.

\textsuperscript{41} Nigro et al. 2011, 585.
\textsuperscript{42} Nigro 2005, 119.
\textsuperscript{43} Gophna - Portugali 1988, 14-15; Finkelstein - Gophna 1993, 10. Differently from I. Finkelstein in the highlands region, R. Gophna and J. Portugali recognized three ranges of size for the sites: small, up to 1 ha; medium, between 2 and 5 ha; large between 10 and 12 ha. The proposed density coefficient - calculated per hectare and multiplied by extension - was 150 people for small villages, 120 for medium ones and 100 for large sites. For the specific case of Jericho, see Gallo in this volume.
\textsuperscript{44} Nigro 2010a, 20.
\textsuperscript{45} Nigro - Sala - Taha eds. 2011. See also the website page: www.lasapienzatojericho.it/padis/.
\textsuperscript{46} Anati 1962, 28; North 1981; Nigro 2005, 198, 120; 2011, 5-10; 2014a, 67; 2016, 8. The abandonment of the entire area was probably due to a temporary draining of ‘Ain es-Sultan spring.
\textsuperscript{47} N. Anfinset (2006, 74) suggests a dispersal settlement pattern organization also for the Late Neolithic-Chalcolithic periods in the Jericho Oasis.
\textsuperscript{49} Pritchard 1958; Foerster 1993; Netzer 1993; Greenberg - Keinan 2009, 71-72.
\textsuperscript{50} Netzer - Bar-Nathan 2002.
\textsuperscript{51} Garstang 1932; Kenyon 1965.
\textsuperscript{52} Nigro 2005, 120-121; 2010b, 460. The terrace walls erected in the ‘Proto-Urban’ phase can be considered as forerunner of the following fortification line in EB II and maybe proof of the existence of ruling power capable of managing a greater public work.
The spatial organization in the area facing the Jericho Oasis presents one noticeable difference in respect of northern regions whose first evidence is an increase in number of sites and clustering tendency. Surveys and the analysis of the materials\(^{54}\) suggest the presence of few EB I villages: Tell Abu el-‘Alayiq North and South on Wadi Qelt\(^{55}\), and Tell el-Mafjar\(^{56}\) close to Wadi Nu'eima, in which it is not possible to recognize any grouped layout. Tell es-Sultan represents the only medium-sized unfortified site in the area, probably together with Tell Abu el-‘Alayiq North and South, and is located in the middle of two wadis. Compared to the inner highlands and coastal regions\(^{57}\) this sector appears so depopulated whereas the linear settlement arrangement along the wadi and water sources has been confirmed in this area as in the rest of Jordan Valley. It is unclear what the underlying relationship between Tell es-Sultan and neighboring sites were, even if the undisputed agricultural and commercial vocation\(^{58}\) would suggest a key site position for Jericho already at the down of EB I\(^{59}\).

\(^{53}\) Broshi - Gophna 1984, 44; Nigro 2010a, 461-463; 2011; 2014a, 67.
\(^{54}\) Conder - Kitchener 1883, 215; Greenberg - Keinan 2009, 8, 20, 69; D’Andrea - Sala 2011a; 2011b.
\(^{55}\) D’Andrea - Sala 2011b, 99-100, 102-105 (Sites nos. 1, 7). The two sites seem to extend over a total area of ca. 12 ha.
\(^{56}\) D’Andrea - Sala 2011b, 128 (Site n. 54). Tell el-Mafjar occupied about 2 ha.
\(^{57}\) Finkelstein - Gophna 1993, 8; Zertal 2008, 71-72.
\(^{58}\) Selling - Watzinger 1913, figs. 107, 109-110; Garstang - Ben-Dor - FitzGerald 1936, pl. XXXVI:26; Finkelstein - Gophna 1993, 13; Eisenberg 1996, 21; Yekutieli 2001, 676-677; Nigro 2007, 9; 2014b, 31; Sala 2012, 275, 281, tab. 1; Greenberg 2014, 269-270. The relations
REFERENCES

ANATI, A.

ANFINSET, N.

BAR, S.
2014 The Dawn of the Bronze Age. The Pattern of Settlement in the Lower Jordan Valley and the Desert Fringes of Samaria During the Chalcolithic Period and Early Bronze Age I (Culture and History of the Ancient Near East 72), Leiden 2014.

BROSHI, M. - GOPHNA, R.

CONDER, C.R. - KITCHENER, H.H.

D’ANDREA, M. - SALA, M.
2011a “History of Travels, Tours and explorations in the Jericho Oasis, from the earliest pilgrims to the current archaeological activities”, in L. Nigro - M. Sala - H. Taha (eds.), Archaeological Heritage in the Jericho Oasis. A systematic catalogue of archaeological sites for the sake of their protection and cultural valorization (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan 7), Rome 2011, pp. 55-76.

DAVIDOVICH, U. - GOLDSMITH, Y. - PORAT, R. - PORAT, N.

DORRELL, P.

EISENBERG, E.

between Canaan and Egypt, started in EB IA and increased in EB IB, not only gave impetus to Southern Levantine economy, but played a fundamental role in the complex process of social reorganization of the Levantine region. The considerable corpus of Egyptian and Egyptian-like objects found in the EB IA-B layers of Tell es-Sultan testifies to a social stratification and central role in the commercial network that the site owned (Sala 2012).

LEONARD, A. JR.

LOVELL, J.L.

LOVELL, J.L. & BRADLEY, A.

MILEVSKI, I.

DE MIROSCHEDEJ, P.

NETZER, E.

NETZER, E. & BAR-NATHAN, R.

NIGRO, L.


2010a Tell es-Sultan/Jericho in the Early Bronze II (3000-2700 BC): the rise of an early Palestinian city. A synthesis of the results of four archaeological expeditions (Rome «La Sapienza” Studies on the Archaeology of Palestine & Transjordan 5), Rome 2010


2011 “Distributive analysis and occupational study in the Jericho Oasis from the Neolithic up the Ottoman Period”, in L. NIGRO - M. SALA - H. TAHÁ (eds.), Archaeological Heritage in the Jericho Oasis. A systematic catalogue of archaeological sites for the sake of their protection and cultural valorization (Rome «La Sapienza” Studies on the Archaeology of Palestine & Transjordan 7), Rome 2011, pp. 5-27.

2014a “The Archaeology of Collapse and Resilience: Tell es-Sultan/Ancient Jericho as a Case Study”, in L. NIGRO (ed.), Overcoming Catastrophes. Essays on disastrous agents characterization and


WHITCOMB, D. - TAHIA, H.

YEKUTIELI, Y.

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CONCEPTUALIZING URBAN EXPERIENCES

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Early Bronze cities across the Jordan

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