

PREHISTORIC INVESTIGATIONS ALONG THE CROSS-ISRAEL HIGHWAY: STATE OF RESEARCH

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INTRODUCTION

The Cross-Israel Highway is among the largest and most complicated infrastructure projects undertaken in recent years in Israel (see Dagan, this volume); the impact of such a project on the landscape, nature and human resources is irreversible. Prehistoric sites along the highway route were under immediate threat due to the fact that they are often invisible, buried deep below the surface. For this reason, prehistorians were involved from the earliest planning stages of the survey conducted along the intended route and were an integral part of the surveying units. This scheme enabled optimal documentation of the prehistoric remains along the highway. In the Cross-Israel Highway survey, teams of archaeologists and prehistorians surveyed over 1500 sq km in differing landscapes, documenting each findspot and establishing its age and ancient environment. Subsequently, many of these sites were revisited and sounded in order to estimate the depth of the finds, verify the nature of the occupation and determine the successive occupational layers. This field procedure yielded an integrated view of how settlement has shifted in each region over the course of history (see below).

The aim of this overview is to reconstruct the distribution of prehistoric sites according to periods, as well as to accumulate data concerning site function, economics, intra-site interaction, etc., which is relevant especially for the later prehistoric sites (from the Neolithic period onward). Special attention was paid to site formation processes, as these played a major role in site burial and degree of preservation.

The planned route from 'En Tut Interchange to Ma'aḥaz Interchange (135 km in length; see map in cover pocket) was systematically surveyed by a team of archaeologists distanced some 5–15 m from each other, according to field conditions (density, height of vegetation, etc.). Information from previous surveys, such as the Daliyya Map (Olami 1981), indicated a high density of prehistoric sites, including six major sites dated to the Lower and Middle Paleolithic periods and one site attributed to the Late Pottery Neolithic period. Thus, a detailed prehistoric survey was conducted in this geographically well-defined area to review and validate the earlier data.

When a flint concentration was located, its density and boundaries were determined, then the finds were sampled and the site plotted on the survey map. In order to determine the nature of the site and its chronological attribution, two modes of sampling were applied: at first only diagnostic items were collected for the determination of the date; if this proved insufficient, a non-systematic collection of a random number of items—including waste material—was conducted.

Prehistoric occurrences were defined following criteria used in previous prehistoric surveys (Bar-Yosef and Phillips 1977:4–6; Bar-Yosef and Goren 1980:4–5; Hermon 1996: 42–46; Bankirer et al., forthcoming). Three types of occurrences were defined as follows:

Site.— A high concentration of mainly flint artifacts (over 30 items per sq m), including debitage, spread over a well-defined area. For Paleolithic sites this would usually be no larger

than 1000 sq m (0.1 ha; e.g., Kefar Menaḥem). For Neolithic and Chalcolithic sites, the concentration of artifacts (bones, groundstones, ceramics, flint, etc.) could be distributed over a much larger, but still well-defined, area (over 0.5 ha), and may also include architectural remains (e.g., Ḥorbat Naḥur, Ḥorbat Petora North).

Highly Eroded Site.—An area highly disturbed by post-depositional processes (natural and anthropogenic). These processes caused the dispersal of the finds over a vast area of over 1 ha. In this case, there is difficulty in defining the site's boundaries (e.g., the Ramot Menashe sites).

Findspot.—Isolated items or a scattering over a well-defined surface area (up to 100 sq m). In cases where a few flint artifacts were recognized within the area of a stratified site, it was still defined a findspot, although it may represent an ancient settlement (e.g., Jaljuliya West and Sha'ar Efrayim).

THE SITES

In the systematic survey of the planned route and the subsequent excavations along the Cross-Israel Highway we were able to identify 31 prehistoric sites dating from the Lower Paleolithic period to the Chalcolithic period, covering a time span of at least 500,000 years of human occupation. Of these sites, eight date to the Lower Paleolithic, of which three also contain Middle Paleolithic finds, another eight date to the Epipaleolithic and Neolithic periods and 20 date mainly to the Chalcolithic period (Table 1); site numbers refer to the survey map of Daliyya (Olami 1981).

Based on the survey results, 24 prehistoric sites were excavated and their material was systematically collected. In the case of the other six occurrences, the highway route was diverted and the sites were partially preserved (e.g., Ramot Menashe 103, 104, Jaljuliya West). This review presents a brief description of the

surveyed and excavated sites for which there is available data, from north to south (Table 1; Figs. 1–3). In the following discussion of settlement patterns, this data is compared with that from other sites from the same period.

LOWER PALEOLITHIC PERIOD

(1.4 m–250/200 ka BP) (Fig. 1)

During the prehistoric survey, eight Lower Paleolithic open-air sites were recorded. Five comprised eroded surface collections, while two of the sites, Eyal 23 and Kefar Menaḥem West, were embedded between different paleosols and reflect more *in-situ* depositions. In addition, one large collection of Lower Paleolithic material was found in secondary deposition within gray *rendzina* soil west of Kibbutz Magal (Khalaily and Golan, per. comm.). These occurrences can be compared with other Lower Paleolithic sites excavated along the coastal plain and in the southern Shephelah (e.g., the Revadim and Kefar Menaḥem localities, Ḥolon).

Ramot Menashe

A number of highly eroded sites of Lower and Middle Paleolithic date are located on the banks, terraces and low hills of Naḥal Menashe, Naḥal Mo'ed and Naḥal Shelef (Olami 1981: Sites 85, 86, 103, 104, 122, 123; Table 1) and in the vicinity of the 'En Tut Interchange (Olami 1981:44, Site 67). Sites 122 and 123 (Fig. 1), parts of which were accidentally destroyed during the highway construction, comprised large scatters of artifacts (4–9 ha) on the southern bank of Naḥal Menashe and on the terraces at the confluence of Naḥal Menashe and Naḥal Mo'ed. The artifacts, as well as numerous flint nodules, were embedded within the dark-gray alluvial soil (*grumusol*) on the wadi floodplain and within the pale *rendzina* on the upper terraces. The flint assemblage was mixed, including Lower Paleolithic diagnostic artifacts, such as handaxes, as well as a large Levallois component, such as cores, flakes and points. The poorly preserved artifacts are abraded and commonly display double patina,

Table 1. Prehistoric Sites along the Cross-Israel Highway Route

Site (No.)	Map Ref. (NIG)	Period	Definition	Status	Discovery
‘En Tut (67)	205150/724400	Lower Paleolithic, Middle Paleolithic	Eroded site	Excavated	Olami 1981
Ramot Menashe (122, 123)	360268/691258 360899/691751	Lower Paleolithic, Middle Paleolithic	Eroded sites	Surveyed	Olami 1981
Ramot Menashe (103, 104)	360973/693636 360953/693841	Lower Paleolithic, Middle Paleolithic	Eroded sites	Surveyed	Olami 1981
Magal	202060/699450	Lower Paleolithic	Secondary deposition	Surveyed	Current survey
Eyal 23	196000/679350 196600/679200	Lower Paleolithic	Site	Excavated	Ronen and Winter 1997
Kefar Menaḥem West	183300/627550	Lower Paleolithic	Site	Excavated	Construction work
Sha‘ar Efrayim (South)	200400/687700	Epipaleolithic, PPNA	Eroded site/ Findspot	Excavated	Current survey
Jaljuliya West	196570/674000	Epipaleolithic, PPNA	Findspot	Surveyed	Current survey
Sha‘ar Efrayim (3 sites)	200400/687700	Chalcolithic, PPNB, PN	Burial cluster/ Findspot	Excavated	Current survey
Ḥorbat Naḏur	203750/708960	PN, Chalcolithic	Residential site	Excavated	Current survey
Tel ‘Eran	202686/713117	Chalcolithic	Eroded site	Excavated	Current survey
Barqai	203600/708000	Chalcolithic	Findspot	Excavated	Current survey
Barqai	203600/708000	Chalcolithic	Burials	Excavated	Construction work
Mazor West/ Qula (2 sites)	194866/661589 195800/660140	Chalcolithic	Burial cluster	Excavated	Construction work
Giv‘at Oranim (2 sites)	19700/657050	Chalcolithic	Residential site	Excavated	Construction work
Ḥorbat Ḥani West	196370/659420	Chalcolithic	Ephemeral site	Excavated	
Ḥorbat Nevallaṭ	196513/654193	Chalcolithic	Residential site	Excavated	Current survey
Tel Ḥamid Terrace	189650/645900	PN, Chalcolithic	Ephemeral site	Excavated	Construction work
Tel Maloṭ East (2 sites)	187768/640400 187450/640400	PN, Chalcolithic	Ephemeral site	Excavated	Construction work
Ḥorbat Petora North (2 sites)	182300/611950 182300/611180	PN/ Chalcolithic	Residential site	Excavated	Construction work
Qarqar	181500/608500 181500/608100	Chalcolithic	Burial cluster	Excavated	Construction work
Naḥal Shalva	605870/180850	Chalcolithic	Residential site	Excavated	Construction work

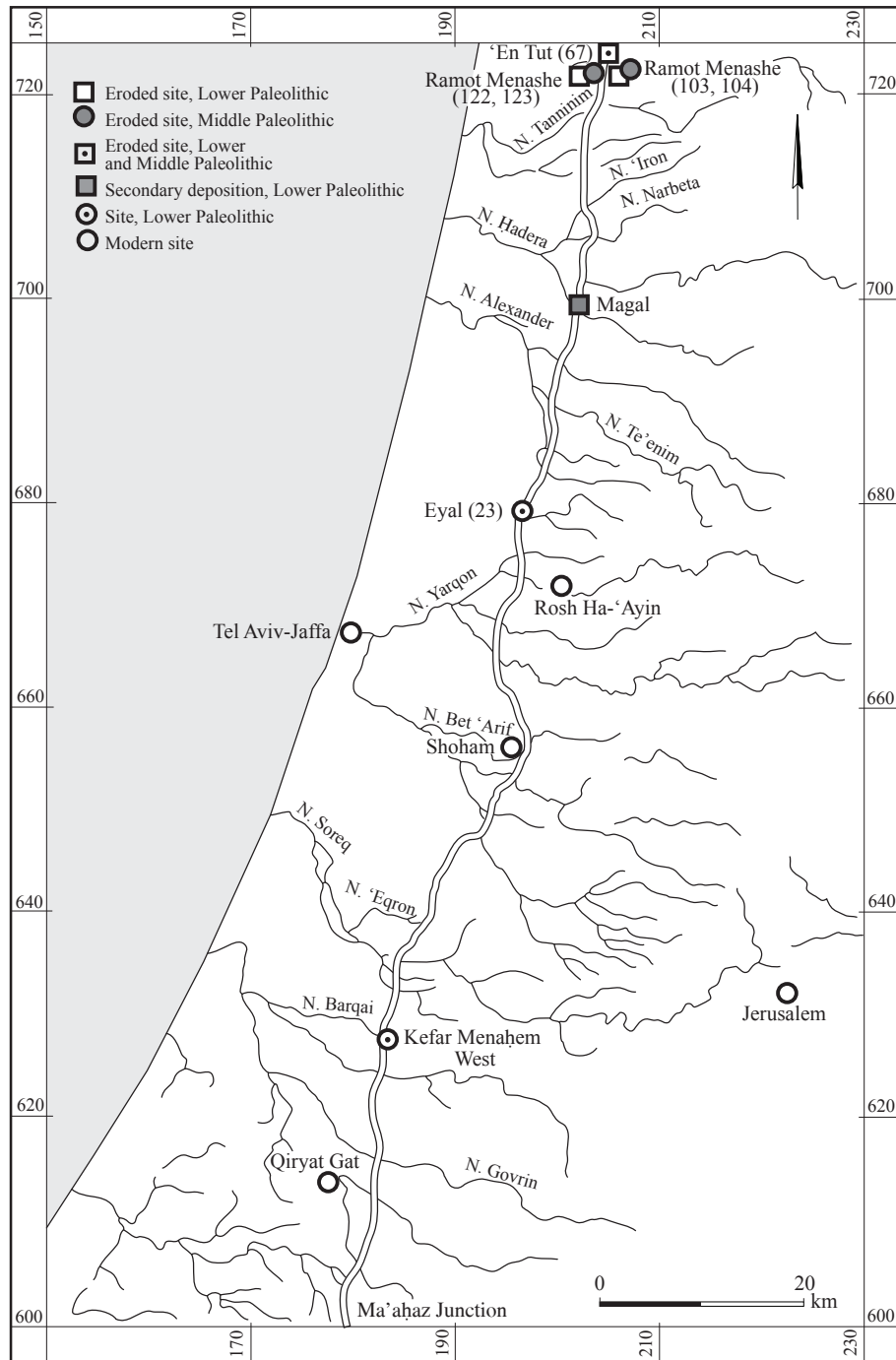


Fig. 1. Early and Middle Palaeolithic sites along the Cross-Israel Highway.

as well as edge damage. The same phenomenon (mixing of Lower and Middle Paleolithic artifacts and poor preservation) was observed in the vicinity of the 'En Tut interchange

(Site 67), dispersed over a large area of 7 ha (c. 200 m asl) along the eastern bank of Nahal Boded (Polina Spivak and Zinovi Matskevich, pers. comm.).

Site 103 was a large scatter of artifacts distributed over an area of c. 8 ha, located on a low hill (204 m asl), between Naḥal Menashe and Naḥal Mo'ed, while Site 104 was probably a southeastern extension of this site on the lower terraces north of Naḥal Menashe. These two localities were not in primary deposition, but rather, were probably part of a quarrying and knapping site related to a large exposure of high-quality Eocene flint, which was exploited mainly during the Lower Paleolithic, but also during the Neolithic and Chalcolithic periods (Olami 1981:44, 53, 54, 63–65). At Sites 53, 54 and 103, a large collection of handaxes was found ($n = 1125$ from the three sites), consisting mainly of amygdaloid, discoidal-cordiform and elongated-cordiform shapes. Such tools were attributed by Olami to the Late Acheulian techno-complex (Olami 1981:52–53, 63).

Magal

Numerous Acheulian flint artifacts were found during construction of the Cross-Israel Highway (Table 1), approximately 2 km west of Kibbutz Magal. The artifacts were discerned within the upper part of a *grumusol* layer in the road section, as well as within the road infrastructure, heavily disturbed as a result of the construction. Consequently, a short survey was conducted in order to identify the nature of the finds and the geological formation to which they were associated. The flint collection includes handaxes, chopping tools and large flake cores, all characteristic of the Acheulian techno-complex. Most of the artifacts are abraded and display a double brown patina, indicating that the items had been exposed on the surface for a long time.

Taking into consideration that the artifacts were found within a substantially disturbed layer, as well as their poor preservation, it is reasonable to assume that most of the finds were not *in situ*, having been transported to the findspot by secondary deposition from a nearby site.

Eyal 23

This Lower Paleolithic site is located on a hill (67.5 m asl) west of Kibbutz Eyal on the eastern edge of the Sharon coastal plain, close to the Samarian Hills (Ronen and Winter 1997). An excavation was conducted during 1996–1997 as part of the Cross-Israel Highway project, exposing a large area of c. 100 sq m to a depth of c. 4 m. Five sedimentary units were revealed, which were described as follows (Winter, Neber and Ronen 1999): Unit 1—*grumusol*; Unit 2—transitional zone between the *grumusol* and the *hamra*; Units 3, 4—upper and lower red paleosol (*hamra*); Unit 5—*gley*. Within the first four sedimentary units, four superimposed archaeological horizons were identified (Horizons 1–4), consisting exclusively of flint artifacts; no bones were preserved. The artifacts within the *grumusol* (Horizon 1) were possibly not *in situ* due to human activities. However, most of the flint artifacts were horizontally oriented, thus the authors claim that artifact displacement was minimal (Winter, Neber and Ronen 1999:474). The flint assemblage was small (<500 according to Ronen and Winter 1997: Table 1), consisting of only 25 tools in Horizon 1 and 11 in Horizon 2. Levallois technology was common in all the horizons, but most developed in the uppermost, Horizon 1. Based on the fact that all the archaeological layers, except Horizon 4, included handaxes, they were assigned to the Acheulian techno-complex (Winter, Neber and Ronen 1999:474).

Kefar Menaḥem West

The site of Kefar Menaḥem West is located in the southern Shephelah, on a gentle slope of a low hill (85–86 m asl). It is one of several Lower Paleolithic localities scattered around Kibbutz Kefar Menaḥem, which have been excavated in the past (Gilead and Israel 1975; Goren 1979; Lamdan 1982).

This site was discovered during construction of the highway, embedded below a thick sequence of paleosols (2–4 m). The flint artifacts were found directly at the point of

contact between the gray-brown paleosol (Unit II; 0.4–0.8 m thick) and the *hamra/husmas* (Unit III; >1.5 m). The site was identified as a primary depositional context (*in situ*), based mainly on the successful refitting of four flakes to their core, as well as the good preservation of the artifacts (Barzilai, Malinsky-Buller and Ackerman 2006:29). The flint industry is characterized by several Lower Paleolithic flake technologies, the most important technological concept being the ‘Central Surface’, which resembles the discoidal and Levallois volumetric concepts. The tool-kit includes small flake tools (scrapers, awls, notches and multiple tools) and core-choppers. Handaxes are absent, although a few were found in the site’s vicinity. As no radiometric dates are available, the site was attributed to the Lower Paleolithic based on the characteristics of the lithic industry, obtaining a wide range between Middle to Late Acheulian (780–200 ka).

EPIPALEOLITHIC AND PRE-POTTERY NEOLITHIC A (PPNA) PERIODS (20,000–8,500 BCE cal.) (Fig. 2)

Epipaleolithic and PPNA remains along the Cross-Israel Highway were extremely scarce. Only one Epipaleolithic findspot at Jaljuliya West and an Epipaleolithic/PPNA findspot at Sha‘ar Efrayim South were recorded within a radius of c. 10 km from the route (Marder et al. 2007). Sha‘ar Efrayim South is the only site that produced diagnostic tools indicating a PPNA occupation. Given the high concentration of sites of this period in the area of Modi‘in (Zbenovich 2006; Marder et al. 2007: Table 7), and at Qula 203 (Zbenovich, forthcoming) and Tel Bareqet (Rosenberg and Groman-Yaroslavski 2005), the scarcity of PPNA sites in the survey area is surprising.

Jaljuliya West

This findspot was located during the initial survey, but not revisited. Flint artifacts and animal bones were embedded within the *hamra* layer. The flint collection consists of an

Epipaleolithic lunate, and chisels and axes of PPNA or possibly Chalcolithic date.

Sha‘ar Efrayim South

A dense concentration of flint artifacts was scattered over 500 sq m along two terraces and a hill slope between two modern quarries. Four 1 × 1 m squares were excavated by Barkai (1998) to a depth of 0.7 m, revealing a sequence of natural depositions of sediments from the slope. While a dense concentration of artifacts was discerned on the surface, very few were found within the excavated sediments. The flint assemblage was heterogeneous, comprising Middle Epipaleolithic (Geometric Kebaran; Barkai 1998: Fig. 2:12), as well as Late Natufian flint artifacts, including exhausted flake cores and blades/bladelets and lunates modified by abrupt retouch (Barkai 1998: Figs. 1:2–5; 2:7, 8). An adze-like herminette and three tranche axes typical of the PPNA were also recovered (Barkai 1998: Fig. 3:1, 2).

In conclusion, the finds from Sha‘ar Efrayim South represent several phases of human occupation. In 2002, the site was resurveyed following infrastructure works, and a systematic collection of flint artifacts was carried out over an estimated area of 240 sq m (Khalaily and Milevski 2006). The preliminary results are similar to those of the previous excavation. However, it seems that the Geometric Kebaran occupation was more extensive than previously estimated.

POTTERY NEOLITHIC (PN) PERIOD (6400–4700 BCE cal.) (Fig. 2)

The PN period has been divided into early (PNA) and late (PNB) phases following the excavations of Kenyon at Jericho (Kenyon 1981). Within the PNA, the Yarmukian and Jericho IX/Lodian cultures are discerned, while the PNB includes the Wadi Rabah culture, comparable to what Garstang referred to as Jericho VIII (Garstang et al. 1936). The considerable confusion and multiple terminologies for this period are a result of the many small assemblages derived

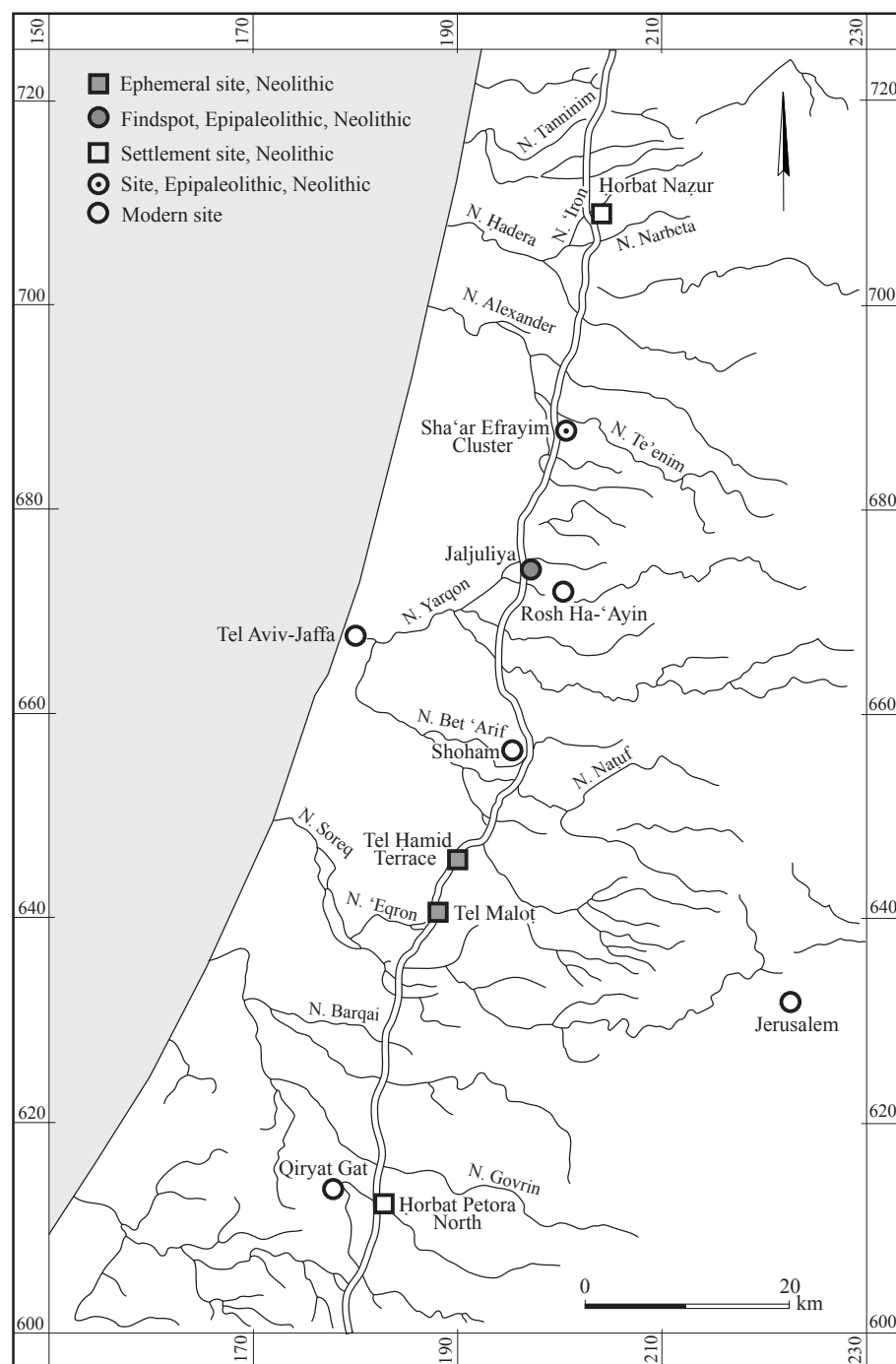


Fig. 2. Epipaleolithic and Neolithic sites along the Cross-Israel Highway.

from problematic contexts, the absence of radiocarbon dates and much unpublished data (Gopher and Gophna 1993:302). Gopher (1995) adopted the term 'Lodian' to describe

certain cultural features in this general period and suggested that the Lodian culture, more or less synonymous with Jericho IX, was later than the Yarmukian (Khalaily 1999; Gopher

and Blockman 2004). Garfinkel (1999:5–6), on the other hand, combined both PNA cultures into a single stage termed ‘Pottery Neolithic’ and included the following PNB phase within the Chalcolithic period, subdividing it into Early Chalcolithic and Middle Chalcolithic phases.

The cultural terminology of the time span between the Wadi Rabah culture and the following Chalcolithic period is especially problematic due to several regionally overlapping cultures, such as the Wadi Rabah variants (e.g., Khalaily, forthcoming[b]), the Qatifian and the Besorian cultures (Gilead 1990; 2007). For the purposes of this paper, and to avoid the use of confusing terms, we use the basic terms Early and Late Neolithic (EPN and LPN) when discussing chronological sequences, and ‘cultures’ to distinguish contemporaneous material cultures.

Although no PN sites were discovered during the survey itself, the intensive excavations that followed the survey uncovered EPN and LPN remains at several sites along the route. Following is a brief description of the finds and their cultural affiliation (Fig. 2):

Horbat Nazur

This site is situated south of Nahal ‘Iron, on a hill sloping gently from east to west (c. 88 m asl). A large depression had been eroded in the bedrock on the summit of the hill and the archaeological remains were discovered in this depression, c. 1 m below the natural surface. The excavator defined a single occupational layer upon the bedrock (Yannai, forthcoming). The architectural remains included several brick structures atop stone foundations that took advantage of the large natural depression. Due to the poor state of preservation, no complete buildings were exposed, and the pottery assemblage contained a small number of types. While no small V-shaped bowls, the most common type in Chalcolithic pottery assemblages, were recovered, the flint assemblage shows great similarity to Chalcolithic flint assemblages. Based on the absence of V-shaped bowls and

the general dissimilarity in ceramic fabric, the excavator assigns the occupation at H. Nazur to a ‘Nazurian entity’ that is later than the Wadi Rabah culture and earlier than the Chalcolithic period (Yannai, forthcoming).

Sha‘ar Efrayim

The Chalcolithic and Early Bronze Age I burial site near Sha‘ar Efrayim is located on the eastern edge of the Sharon plain, between Nahal Alexander and its tributary, Nahal Te‘enim (van den Brink, forthcoming). The site was identified as a Chalcolithic settlement and one burial cave was initially excavated (Scheftelowitz and Oren 2003; 2004). Subsequent salvage excavations by van den Brink revealed four additional burial caves. In one of the caves (Cave 3), three Neolithic tools were identified, distinguished by their typology and raw material, which was high-quality flint unavailable locally. One of these artifacts is a fragment of a sickle blade made on a long, bipolar blade typical of PPNB tools, while the remaining two items are small projectile points of the Nizzanim type (Gopher 1994:41). Such points are characteristic of the EPN Jericho IX/Lodian cultural assemblages (Khalaily, forthcoming[a]).

Tel Hamid, Lower Terrace

This site was surveyed in the early 1990s and the lower terrace was excavated during two seasons in 1995 and 1996 (Tal 2000; Tal and Blockman 1998). Prior to excavation, the site was sounded and the various excavation areas were determined based on the results. In two of the four areas (B, C), Neolithic finds were detected, distributed over an area of c. 500 sq m.

The architectural remains were clustered near a permanent water source, in close proximity to the tell. In Area B, a living surface was exposed at a depth of 1.5 m, built up of stone layers mixed with artifacts, and the outlines of pits and several concentrations of Neolithic artifacts were identified. The finds included a variety of ceramic vessels and flint tools typical of the Jericho IX and Wadi Rabah cultures, such as small arrowheads, sickle blades and

bifacial tools. Judging from the size of the site, the scarcity of architectural remains and the minimal number of tools, it is most probable that the Neolithic occupation was ephemeral in nature.

Tel Malot (East)

Two salvage excavations were conducted to the east and southeast of Tel Malot (Parnos, Milevski and Khalaily, this volume). Several PNA features were revealed, including pits dug into the *hamra* with a packed, light brown fill containing small stones together with sherds, flint items and animal bones. The pottery and flints are homogenous and have characteristics in common with the Jericho IX culture of the seventh–sixth millennia BCE (cal.). The sherds were handmade and tempered with considerable quantities of straw. Some are of very pale brown clay with calcite grits and a dark gray core.

The formal flint tools include ‘Amuq arrowheads and one Byblos arrowhead. The points were shaped by partial pressure retouch and are generally short, their length not exceeding 2 cm. All the sickle blades display coarse, denticulated working edges, shaped by bifacial pressure retouch. A few bifacial tools were found, most of them axes.

Horbat Petora North

This site is located on a small hill on the northern bank of Nahal Lakhish, between Tel Lakhish and Tel ‘Erani, some 20 m above the surrounding area (c. 180 m asl). A total of 350 squares were excavated during three seasons between 2002 and 2005, comprising c. 0.9 ha of the estimated total area of at least 7 ha (Milevski and Baumgarten 2008). The excavations revealed an ashy sediment, containing Neolithic artifacts, but no architectural remains, lying upon bedrock below thick layers of Chalcolithic and Early Bronze Age remains.

The finds include ceramic vessels characteristic of the Jericho IX culture, including coarse, straw-tempered, handmade types, as well as many flint objects, such as typical

Nizzanim projectile points and thick sickle blades shaped by pressure retouch with deep denticulated working edges. In addition, a ceramic, Yarmukian-style female figurine was unearthed.

THE CHALCOLITHIC PERIOD

(4700–3800 BCE cal.) (Fig. 3)

The Chalcolithic period, in contrast to the preceding Neolithic period, presents a greater degree of socio-economic organization, with cemeteries located outside settlements, as well as craft specialization in the production of copper, ivory, ceramic and flint artifacts. However, its designation as a complex society is still under debate and definitions of Chalcolithic societies range from an egalitarian society (Gilead 1988) to a chiefdom (Levy 1998).

The Chalcolithic period in the southern Levant is defined by a large assemblage of sites and distinctive sets of artifacts. As it was first recognized at Teleilat Ghassul in southern Jordan, the associated cultural assemblage came to be known as the Ghassulian culture (Neuville 1930; Mallon et al. 1934; Lovell 2001; Rowan and Golden 2009). Now, the Ghassulian is recognized as one of several cultural entities within the Chalcolithic period (Gilead 2007; in press). Gopher and Gophna (1993) argued that the Ghassulian culture originated in the Early Pottery Neolithic socio-economic systems, and recent excavations at Teleilat Ghassul (Bourke and Lovell 2004) and other sites in the Jordan Valley (Rowan and Golden 2009:6) have shown that this culture derived directly from the preceding Neolithic cultures.

Chalcolithic sites are widely distributed throughout the southern Levant, within the Mediterranean, semi-arid and arid climatic zones, and are classified as caves, temporary and permanent sites. Based on the variability in material culture, it is now widely accepted that the Chalcolithic period should be divided into three cultural complexes: Be’er Sheva’, Ghassulian and Golan. Nevertheless, Gilead

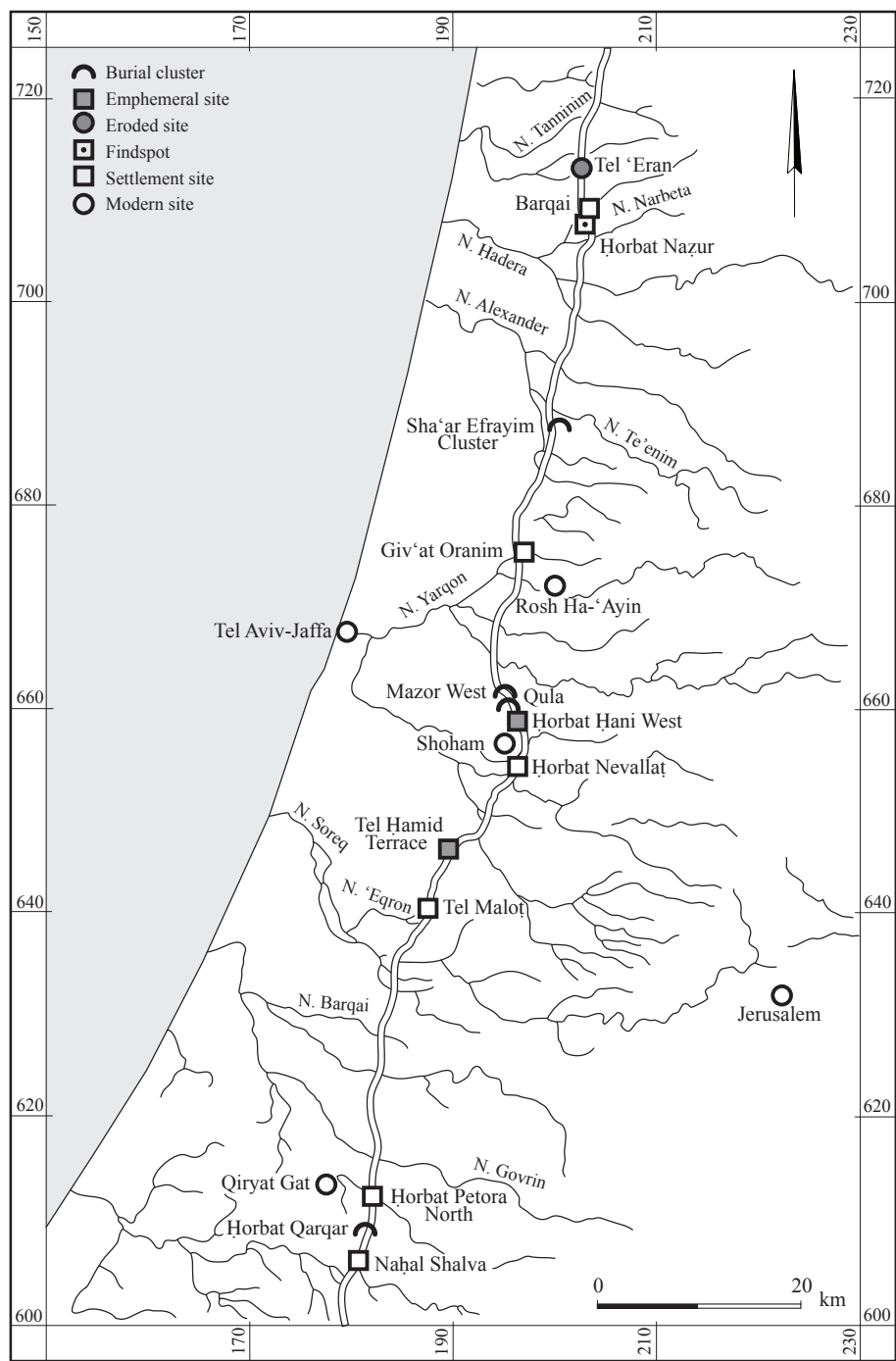


Fig. 3. Chalcolithic sites along the Cross-Israel Highway.

(in press) considers these three entities a single chrono-cultural complex.

Only four Chalcolithic sites were discovered during the Cross-Israel Highway survey (Tel

'Eran, Barqai, Tel Hamid Terrace and Nahal Shalva; see Table 1), based on scattered Chalcolithic sherds on the surface. Deep soundings and trenches conducted prior to

excavations along the highway route increased the number to 13 Chalcolithic sites, and the salvage excavations increased the number yet again to 20 sites. The fact that so many of the Chalcolithic sites were not discovered during the survey is not surprising, as most were either burial caves or buried deep below later occupations.

Following is a short description of selected Chalcolithic sites that were documented after surveys and excavations along the route, based on the available data. Twenty Chalcolithic sites were examined and excavated, three of which were burial clusters. Only five sites could be defined as permanent settlements (Table 1; Fig. 3).

Burial Caves

Sha'ar Efrayim Cluster

Several karstic caves are located on the northwestern slope of a limestone hill east of the settlement of Sha'ar Efrayim. One of the caves was examined by Yannai in 1990 and later excavated by Oren and Scheftelowitz in 1995 (1998:91). In 2002, five additional caves were discerned in the lower section of this hill and subsequently excavated by van den Brink (forthcoming). These caves were used for burial purposes during the Chalcolithic period and large quantities of diagnostic flint, pottery, ossuary fragments, human bones and female clay figurines were found. Churns and cornets are absent in the ceramic repertoire, while holemouth jars and bowls are common. Parts of some caves were reused for burial during EB I, a phenomenon that has been recorded at other sites as well (Gophna and van den Brink 2005).

Qula-Mazor Cluster

The initial stages of construction of the Cross-Israel Highway led to the discovery of eight burial caves in the area of Qula-Mazor, c. 15 km east of Tel Aviv. This cluster of burial caves is located on the western slopes of the moderate limestone hills of the Shephelah. The Qula caves were excavated between 1997 and 2000

(Milevski 2002), while the Mazor caves, approximately 1 km northwest of Qula, were excavated in 2000 and 2001 (Milevski 2007). The caves revealed a rich collection of burial containers and related ceramic assemblages, as well as unique items that added important insights into the phenomenon of Chalcolithic burial customs in the southern Levant. There is significant inter- and intra-site variability in the material culture between the caves of Qula and those of Mazor, and among the caves themselves, which reflects the diverse burial customs of this period. At Qula, for example, there are burials in both ceramic and stone ossuaries, as well as other burials in jars, and associated cultic items include fertility figurines (Milevski 2002:136), while at Mazor the burials are mainly in simple ossuaries and deep bowls (Ianir Milevski, pers. comm.). This variability is also reflected in the accompanying ceramic types, each burial cave displaying distinct ceramic vessels. In general, there is a low frequency of bowls and cornets in the Qula caves in contrast to the Mazor caves, where the ceramic assemblage is dominated by bowls and cornets are absent (Lupo 2008). Petrographic analyses of selected sherds (Cohen-Weinberger, forthcoming) have revealed that the vessels originated from three different regions: the coastal plain, the area of Gezer, and, probably, the Judean Hills (Moza Formation). This may indicate that the caves were used by different communities during the Chalcolithic period.

Horbat Qarqar Cluster

The seven-week salvage excavation conducted at the site of Horbat Qarqar South in late 2005 and early 2006 revealed a concentration of dozens of burial caves dated to the Chalcolithic period (Peter Fabian and Isaac Gilead, pers. comm.). Some of these caves were exposed in the sections on either side of the road and others were truncated by the cutting of the road. Twenty-five caves, varying in dimension and shape, were excavated. The finds included large ceramic and stone ossuaries, along with numerous smaller vessels, such as V-shaped

bowls, globular bowls and cornets, and many other votive vessels that were placed as offerings.

Settlements

The intensive excavations that followed the systematic survey have uncovered many Chalcolithic habitation sites along the Cross-Israel Highway. Several were known from previous surveys, such as Tel 'Eran (Dagan and Eisenberg, forthcoming) and Ben Shemen (Perrot and Ladiray 1980); however, the majority was discovered in the course of the survey and salvage excavations. Sites, such as H. Nazur (Yannai, forthcoming), Giv'at Oranim (Scheftelowitz and Oren 2004), H. Nevallat (van den Brink and Lazar, forthcoming) and H. Petora North (Milevski and Baumgarten 2008), are large Chalcolithic settlements with buildings, courtyards and installations that are related to daily activities within the site. In contrast, other Chalcolithic occurrences with a minimal repertoire of vessels at localities such as H. Hani (Lass 2003), Tel Hamid (Tal 2000) and Tel Malot (Parnos, Milevski and Khalaily, this volume) reflect ephemeral settlements.

Giv'at Oranim

The site of Giv'at Oranim is located on a moderate limestone hill, 3 km east of the modern city of Shoham and approximately 3 km south of the Chalcolithic site of H. Nevallat. Two excavation seasons were conducted between 1996 and 1997 by Scheftelowitz and Oren (2003; 2004). An additional season was carried out in 2001 by Eli Yannai (pers. comm.). Although the residents settled in caves and underground spaces, the excavators consider the site to have been residential. The subterranean spaces may have been part of a settlement built on the surface that has not survived.

The diverse material finds included a large number of pottery vessels, some of which were made on-site, while others were brought to the site as finished products. Typical Ghassulian

types include jars, bowls (some of them small cups), churns, cornets and numerous basalt bowls (Scheftelowitz and Oren 2004:61). A unique basalt vessel is a near-square bowl on a high, fenestrated pedestal. It has four ledge handles and displays a distinctive decoration of engraved triangles on the inner rim. Another interesting discovery is several copper objects, similar to those of the Nahal Mishmar treasure, including standards, axes and chisels.

Horbat Nevallat

This site is located in the northern Shephelah (van den Brink and Lazar, forthcoming). The excavation revealed two building stages dated to the Chalcolithic period. Various installations, including cupmarks, were hewn in the bedrock higher up the hill (Area C), above the actual settlement site (Area A; van den Brink 2008). In addition, a few refuse pits and a partially collapsed cave were uncovered. The broad-room buildings had ashy, compacted floors and adjacent courtyards where most of the household's daily activities probably took place. The ceramic repertoire consisted of typical V-shaped bowls, cups, large storage jars and fenestrated pedestals. No cornets or churns were encountered. Among the tool types in the flint assemblage are sickle blades, bifacials and micro-endscrapers. The Chalcolithic material culture of H. Nevallat presents a wide repertoire of types, including hallmarks of the Ghassulian/Be'er Sheva' Chalcolithic cultures, and is domestic in nature.

Horbat Petora North

Four Chalcolithic strata were identified throughout most of the excavated areas. Remains of large structures, hearths, walls and refuse pits were unearthed, indicating an intensive Chalcolithic occupation that spread over an estimated area of at least 2 ha. The buildings were constructed of thick walls with stone foundations and mudbrick superstructures. Most of the structures were rectangular and the rooms, narrow. The excavators did not discern any chronological differences between

the various strata of Chalcolithic occupation (Milevski and Baumgarten 2008).

A large amount of pottery sherds and flint tools were collected, both assemblages presenting all the characteristics of the Ghassulian/Be'er Sheva' cultures. The pottery was dominated by V-shaped bowls and cups. The small vessels show signs of being produced on a tournette. Holemouth jars, fenestrated pedestals and churns were also frequent. Most of the vessels were produced of a coarse paste with large, white and gray grits. However, some of the smaller V-shaped bowls were made of a fine paste with no grits. The flint assemblage is characterized by backed, truncated sickle blades, bifacial tools and fan scrapers.

DISCUSSION: SITE DISTRIBUTION

The Lower and Middle Paleolithic Periods

The discussion of the Lower Paleolithic landscape and paleoenvironment is based on the data collected in the survey and several recent studies of the geological and geomorphological settings and the ancient landscape around Lower Paleolithic sites (e.g., Winter, Neber and Ronen 1999; Netzer and Chazan 2007; Marder et al., forthcoming).

It appears that most of the Lower Paleolithic sites are located on low hills or ridges that could serve as efficient hunting posts. Four of the sites in Ramot Menashe (Sites 67, 85, 86, 104) are situated on a large exposure of high-quality flint, and thus probably functioned as flint quarries and knapping sites. All the Lower Paleolithic sites, with the exception of the knapping sites at Ramot Menashe, are located in close proximity to permanent or seasonal water sources. The sites of Kefar Menaḥem West, and perhaps also Eyal 23, are located in low hill country with undulating slopes dissected by rills and gullies, possibly with a low vegetation cover (see Barzilai et al. 2006). The abundance of manganese nodules within the sediments of Kefar Menaḥem could indicate the existence of annual ponding in the vicinity of the site (and see Marder et al., forthcoming).

A similar phenomenon was observed at the sites of Holon (Chazan and Horwitz 2007; Netzer and Chazan 2007) and Revadim (Marder et al., forthcoming), which are situated adjacent to episodic ponding (Revadim) or marshy landscapes (Holon) that attracted both hominids and animals (e.g., elephants, aurochs, boars, hippopotami).

Dating the Lower Paleolithic sites under discussion is extremely problematic, as no radiometric dates are available and the lithic assemblages are small (<2500 artifacts in all the excavated sites). In fact, the chronological framework of the entire region during the Middle–Late Acheulian is problematic (Marder 2009; Gopher et al., forthcoming). However, based on the typo-technological characteristics, mainly the shape and dimensions of the hand-axes, the Ramot Menashe sites and the upper horizon at Eyal 23 were roughly attributed to the Late Acheulian techno-complex (500–250/200 ka; Olami 1981; Ronen and Winter 1997), while it is possible that the archaeological horizon of Kefar Menaḥem West and the lower horizons at Eyal 23 (Horizons 2–4) display earlier, Middle Acheulian occupations (780–250/200 ka; Ronen and Winter 1997; Barzilai et al. 2006).

The Lower Paleolithic sites were subjected to various post-depositional processes that affected the degree of site preservation and the visibility of the sites during the survey. These phenomena caused problems in the archaeological interpretation and attribution of sites to a certain period or culture and likewise the reconstruction of the Lower Paleolithic settlement pattern. Several post-depositional processes were documented:

Burial of Sites beneath Thick Sediments.— The archaeological horizon at Kefar Menaḥem West was buried below more than 2 m of sediment, a process that probably took place shortly after human abandonment, which explains the primary context of some of the artifacts. A similar phenomenon was recorded at the Lower Paleolithic site of Revadim, located only 5 km north of Kefar Menaḥem (Marder

et al. 1998), where a well-preserved sequence of superimposed archaeological horizons was covered by a layer of sediments over 4 m thick. The site was only discovered as a result of quarrying activities. At Eyal 23, the situation is more complex, as the artifacts were apparently exposed on the surface for a longer period of time than at Kefar Menaḥem. Some artifacts were preserved as a result of a sediment accumulation of over 2 m.

Fluvial Activity.— Ramot Menashe Sites 122 and 123 were a result of low- to high-energy fluvial activities (i.e., channel and overbank), which transported and deposited both Lower and Middle Paleolithic lithic artifacts on the stream banks and lower terraces. These items, in secondary deposition, are highly abraded, patinated and poorly preserved.

Human Activity.— Human activities, such as road construction, heaping of stones and plowing, caused the scatter of artifacts over a large surface area (e.g., the Ramot Menashe and 'En Tut sites), occasionally damaging the uppermost archaeological horizon (e.g., Eyal 23 Horizon I). Moreover, during the construction of the highway, secondary deposition of soil containing numerous Lower Paleolithic artifacts artificially created new 'sites', as at Magal.

As a result of these post-depositional processes, some sites display mixed assemblages (e.g., Ramot Menashe Sites 122, 123). In addition, although Eyal 23 Horizon 1 was originally identified as Late Acheulian, based on the flint artifacts recovered by us in the survey and the illustrations from the site (Ronen and Winter 1997: Fig. 4:5, 6, 8), it is possible that this horizon actually consisted of two separate, Lower and Middle Paleolithic components. This mixing occurred as a result of two different processes: the vertical movement of artifacts along natural fissures within the paleosols, and recent human activities, mainly plowing.

The Neolithic Period

Neolithic sites along the Cross-Israel Highway are scarce and most of them are attributed to the various phases of the Pottery Neolithic period. However, it would appear that these data are biased, as PPNA occurrences are abundant in the Modi'in area, at Qula 203 and at Tel Bareqet (Marder et al. 2007). These sites in the vicinity of the Cross-Israel Highway are part of a cluster of PPNA sites located on the western flanks of the Samarian and Judean Hills between 80 and 400 m asl. Thus, it can be surmised that the single occupation at Sha'ar Efrayaim discerned during the survey does not reflect the actual PPNA settlement pattern. With the exception of the site of Ḥatula (Lechevallier and Ronen 1994), all these sites are located on the exposed slopes and summits of moderate hills, usually relatively high above the surrounding landscape on a bare limestone bedrock surface, accompanied by Cenomanian and Senonian flint outcrops (Marder et al. 2007). Many of the sites were exposed to severe erosion as a result of low-energy fluvial action and possibly also eolian activity, which caused movements of artifacts and soil into cavities within the bedrock surface and down the slope to the bottom of the hill. As a result of this slope wash, the flint artifacts were spread over large areas of 0.05–4.00 ha, much more extensive than the original area of the sites (Marder et al. 2007: Table 7). This is the cause of particular confusion in cases of multi-phase sites such as Sha'ar Efrayim South, where the distributions of the Epipaleolithic and PPNA flint artifacts may have been much more restricted and separate from each other, rendering chronological ascription of the site extremely problematic.

Most of the PPNA sites in the area under discussion (Sha'ar Efrayim South, Modi'in, Tel Bareqet, Naḥal Yarmut 67) lack architectural features, but are characterized by numerous shallow cupmarked surfaces accompanied by groundstones. It seems that these were transient sites, perhaps seasonally occupied over a long period, for the exploitation of raw

material (Grosman and Goren-Inbar 2007), the processing of vegetal resources (Eitam 2009) and the hunting of gazelle, auroch, hare, boar and fox (Marder et al. 2007). The function of these sites is different from semi-permanent or permanent sites such as Ḥatula (Lechevallier and Ronen 1985; 1994) and Qula (Zbenovich, forthcoming), where durable residential architecture and burials were uncovered.

The chronological ascription of this cluster of sites to a particular stage within the PPNA (i.e., Sultanian or Khiamian) is difficult due to their nature, the lack of radiometric dates and the fact that only a few points and Bet Ta'amir knives were retrieved. For example, it cannot be determined whether Sha'ar Efrayim South was occupied in the Late Natufian, as well as in the PPNA, or represents a single-period occupation in the Late Natufian and the onset of the PPNA. Moreover, it is possible that some of these occurrences were also occupied at the beginning of the PPNB, as the only diagnostic tools at these sites (the Modi'in area and Naḥal Yarmut) are transept adzes and axes, which are also present at EPPNB sites (Khalaily et al. 2007).

The distribution of PPNB sites reflects an opposite trend. Only isolated items were reported within the Sha'ar Efrayim caves (Khalaily, forthcoming[a]) and very few PPNB finds have been reported in the vicinity of the route.

In contrast, PN sites are abundant in the regions all along the highway, either as small isolated settlements or occupational layers within stratified sites. Some of the Neolithic remains, especially those of the EPN, were deeply embedded below successive layers of later occupations, as at Ḥ. Petora. In other instances, isolated features or pits were found near an archaeological tell, on the lower terraces of Tel Ḥamid or not far from Tel Malot. Ḥorbat Naḥur is the only PN site that has been excavated and can be considered a single-period occupation. Although it was dated by the excavator to a post-Wadi Rabah culture (Yannai, forthcoming), its stratigraphical affiliation is still under debate.

The PN sites were dispersed further west in comparison to PPN sites, located between the eastern fringes of the coastal plain and the route of the Cross-Israel Highway in the Judean Shephelah and the Samarian Shephelah, although still located near permanent water sources. Most of the sites during the LPN are permanent, with an economy based on agriculture and herding, and the LPN settlement pattern is associated with fertile land bordering the foothills. This pattern can also be noted in the Chalcolithic period.

The Chalcolithic Period

It seems that the regions through which the Cross-Israel Highway passes were intensively settled during the Chalcolithic period. This has already been noted by Gophna and Beit-Arieh (1997:10) in their survey of the map of Lod, and later by Gophna and van den Brink (2005) in their summary of the Chalcolithic site at Shoham North. Three types of sites can be identified: permanent settlements, temporary and cave settlements and burial grounds. Temporary, open-air sites and cave settlements are the most common, reflecting a pastoral way of life. The cave settlements differ in intensity of occupation: some were apparently occupied for a short time, as at Ḥ. Ḥani (Lass 2003); others show a wealth of remains (e.g., Cave 4 in Mazor West; see Milevski 2007), suggesting habitation over an extended period. Open-air sites are identified by hearths and small storage pits (e.g., Tel Malot [East]), key features that appear at sites dug into sediments, as well as those on rocky terrain, where natural depressions were exploited.

Permanent sites are characterized by architectural features, multiple occupational horizons and rich artifact assemblages. Examples uncovered along the Cross-Israel Highway, from north to south, include Giv'at Oranim, Nevalat and Ḥ. Petora. Permanent sites, ranging in size between 0.7 and 1.4 ha, are located in the foothills bordering the alluvial coastal plain, usually on rocky terrain.

Burial grounds are also found in surrounding regions along the highway, mostly in caves,

and they all appear to be related to permanent sites. Secondary burial in stone and ceramic ossuaries and containers is the most common form—large numbers of such burials were found in each cave—compared to the scarcity of Chalcolithic burials at permanent occupation sites. Goren (1990:44) points out that some scholars have suggested that this might indicate central burial grounds for inhabitants of the surrounding regions.

Preliminary results of the excavations of burial caves along the Cross-Israel Highway indicate a great diversity in burial containers and offerings. At Qula, there were burials in both ceramic and stone ossuaries and in jars, while at Mazor the burials were mainly in simple ossuaries and deep bowls. The diversity in burial containers and other ceramic vessels at Horbat Qarqar resembles that in the burial ground at Qula-Mazor. In other caves, such as Sha'ar Efrayim, the burial vessels were large basins and no cornets were present. It is of note that most of the Chalcolithic burial caves under discussion were reused during the Early Bronze Age for the same purpose, as at Mazor West and Sha'ar Efrayim.

The results of the surveys and excavations along the Cross-Israel Highway provided additional evidence of a certain degree of continuity between the culture and economy of the Late Pottery Neolithic and the Chalcolithic periods, particularly in terms of the flint industries and the basic ceramic forms, while other cultural aspects are innovations. Sites with long sequences of occupation, such as H. Petora and Tel Hamid Terrace, indicate a continuity from earlier periods, as has been demonstrated, e.g., at Teleilat Ghassul (Lovell 2001; Bourke and Lovell 2004) and Peqi'in Cave (Shalem 2003).

A wide variety of vessels from burial and domestic contexts have been uncovered at Chalcolithic sites along the Cross-Israel Highway. Most were handmade, but some provide evidence for the use of a tournette, indicating a more specialized pottery production. In general, these ceramic assemblages show similarities with those of the Ghassulian and Be'er Sheva' cultures. The open vessels are dominated by V-shaped bowls, and holemouth jars are the most frequent form among the closed vessels. However, there is a distinct form that appears only in the Chalcolithic assemblages at sites along the Cross-Israel Highway, in the Shephelah and the coastal plain, and that is the cup, a small, carinated bowl with a straight or flaring rim and a flat base (e.g., Perrot and Ladiray 1980: Fig. 125:6, 8–15).

The combination of Ghassul/Be'er Sheva' ceramic forms together with the distinctive cup at sites in this well-defined area, as well as the site hierarchy and the high concentration of burial grounds, perhaps suggests a new regional culture representing a local variant of the Ghassul/Be'er Sheva' of the Chalcolithic period.

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REFERENCES

- Bankirer Y.R., Dagan Y., Zbenovich V., Khalaily H. and Marder O. Forthcoming. The Prehistoric Survey: The Paleolithic through Neolithic Periods. In Y. Dagan ed. *Ramat Bet Shemesh: Landscapes of Settlement from the Paleolithic to the Ottoman Periods*. IAA Reports.
- Barkai R. 1998. Sha'ar Efraim South: A Late Natufian Campsite. *Tel Aviv* 25:94–103.
- Bar-Yosef O. and Goren N. 1980. Afterthoughts Following Prehistoric Surveys in the Levant. *IEJ* 30:1–16.
- Bar-Yosef O. and Phillips J.L. 1977. *Prehistoric Investigations in Gebel Maghara, Northern Sinai* (Qedem 7). Jerusalem.
- Barzilai O., Malinsky-Buller A. and Ackermann O. 2006. Kefar Menachem West: A Lower Paleolithic Site in the Southern Shephela, Israel. *Mitekufat Haeven, Journal of the Israel Prehistoric Society* 36:7–38.
- Bourke S.J. and Lovell J.L. 2004. Ghassul, Chronology and Cultural Sequencing. *Paléorient* 30:179–182.
- Brink E.C.M. van den. 2008. A New Fossile Directeur of the Chalcolithic Landscape in the Shephelah and Samarian and the Judean Hill Countries: Stationary Grinding Facilities in Bedrock. *IEJ* 58:1–23.
- Brink E.C.M. van den. Forthcoming. A Chalcolithic and Early Bronze Age I Burial Ground Near Sha'ar Efrayim in the Sharon Valley, Israel. *'Atiqot*.
- Brink E.C.M. van den and Lazar D. Forthcoming. Nevalat: A Chalcolithic Habitation Site with Agricultural Activity Areas in the Shephelah Region. *'Atiqot*.
- Chazan M. and Horwitz L.K. eds. 2007. *Holon: A Lower Paleolithic Site in Israel* (American School of Prehistoric Research Bulletin 50). Cambridge, Mass.
- Cohen-Weinberger A. Forthcoming. Petrography. In I. Milevski ed. *Excavations at Qula, Israel: The Early Periods*. IAA Reports.
- Dagan Y. 2009. Archaeological Surveys in Israel and their Contribution to our Understanding of Settlement Distribution: The Judean Shephelah—A Case Study. In A.C. Armağan, Y.D. Kıyısında and U.K. Adanmış eds. *A Life Dedicated to Urartu on the Shore of the Upper Sea. Studies in Honour of Altan Çilingiroğlu*. Istanbul. Pp. 217–228.
- Dagan Y. This volume. Archaeological Surveys and Excavations along the Cross-Israel Highway: A Case Study for Data Collection from the Field.
- Dagan Y. and Eisenberg E. Forthcoming. Preliminary Report on the Tel 'Eran Excavations. *'Atiqot*.
- Eitam D. 2009. Late Epipaleolithic Rock-Cut Installations in the Southern Levant: Methodology and Typology. *Paléorient* 35:77–104.
- Garfinkel Y. 1999. *Neolithic and Chalcolithic Pottery of the Southern Levant* (Qedem 39). Jerusalem.
- Garstang J., Ben-Dor I. and Fitzgerald G.M. 1936. Jericho: City and Necropolis (Report for the Sixth and Concluding Season). *Liverpool Annals of Archaeology and Anthropology* 23:67–90.
- Gilead I. 1988. The Chalcolithic Period in the Levant. *JWP* 2:397–443.
- Gilead I. 1990. The Neolithic–Chalcolithic Transition and the Qatifian of the Northern Negev and Sinai. *Levant* 22:47–63.
- Gilead I. 2007. The Besorian: A Pre-Ghassoulian Entity. *Paléorient* 33:33–50.
- Gilead I. In press. Fifth Millennium Culture History: Ghassulian and Other Chalcolithic Entities in the Southern Levant. In Y.M. Rowan and J. Lovell eds. *Culture, Chronology and the Chalcolithic: Transitions in the Late Prehistory of the Southern Levant*. London.
- Gilead D. and Israel M. 1975. An Early Palaeolithic Site at Kefar Menahem. *Tel Aviv* 1:1–12.
- Gopher A. 1994. *Arrowheads of the Neolithic Levant* (ASOR Dissertation Series 10). Winona Lake.
- Gopher A. 1995. Early Pottery-Bearing Groups in Israel—The Pottery Neolithic Period. In T.E. Levy ed. *The Archaeology of Society in the Holy Land*. London. Pp. 205–225.
- Gopher A., Ayalon A., Bar-Matthews M., Barkai R., Frumkin A., Karkanas P. and Shahack-Gross R. Forthcoming. The Chronology of the Late Lower Paleolithic in the Levant: U-Series Dates of Speleothems from Middle Pleistocene Qesem Cave, Israel. *Quaternary Geochronology*.
- Gophna R. and Beit-Arieh I. 1997. *Map of Lod (80)* (Archaeological Survey of Israel). Jerusalem.
- Gopher A. and Blockman N. 2004. Excavations at Lod (Neve Yaraq) and the Lodian Culture of the Pottery Neolithic Period. *'Atiqot* 47:1–50.
- Gophna R. and Brink E.C.M. van den. 2005. Conclusions. In E.C.M. van den Brink and R. Gophna eds. *Shoham (North): Late Chalcolithic Burial Caves in the Lod Valley, Israel* (IAA Reports 27). Jerusalem. Pp. 165–173.
- Gopher A. and Gophna R. 1993. Cultures of the Eighth and Seventh Millennia B.P. in the Southern Levant: A Review for the 1990's. *JWP* 7:297–353.

- Goren N. 1979. Kefar Menahem 'Lashon'. *Mitekufat Haeven, Journal of the Israel Prehistory Society* 16:69–87 (Hebrew).
- Goren Y. 1990. Pottery from Chalcolithic and Early Bronze Age I Cemeteries in Israel: Some New Aspects of the Development of Ceramic Technology. *Eretz Israel* 21:119–126 (Hebrew; English summary, p. 105).
- Grosman L. and Goren-Inbar N. 2007. 'Taming' Rocks and Changing Landscapes: A New Interpretation of Neolithic Cupmarks. *Current Anthropology* 48:732–740.
- Hermon S. 1996. *Methodological Aspects of a Prehistorical Survey—A Case Study—the Yatir Survey*. M.A. thesis. The Hebrew University. Jerusalem (Hebrew).
- Kenyon K. 1981. *Excavations at Jericho III: The Architecture and Stratigraphy of the Tell*. London.
- Khalaily H. 1999. *The Flint Assemblage of Layer V at Hagoshrim: A Neolithic Assemblage of the Sixth Millennium B.C. in the Hula Basin*. M.A. thesis. The Hebrew University. Jerusalem (Hebrew).
- Khalaily H. Forthcoming(a). The Flint Assemblages from Caves 1–3 at Sha'ar Efrayim. *'Atiqot*.
- Khalaily H. Forthcoming(b). Naḥal Yarmut: A Late Pottery Neolithic Site of the Wadi Rabah Culture, South of the Soreq Valley. *'Atiqot*.
- Khalaily H., Bar-Yosef O., Barzilai O., Boaretto E., Boquentin F., Eirikh-Rose A., Greenhut Z., Goring-Morris A.N., Ledosseur G., Marder O., Sapir-Hen L. and Yizhaq M. 2007. Excavations at Motza in the Judean Hills and the Early Pre-Pottery Neolithic B in the Southern Levant. *Paléorient* 33:5–37.
- Khalaily H. and Milevski I. 2006. Sha'ar Efrayim Region, Survey. *HA-ESI* 118 (24.5.2006). www.hadashot-esi.org.il/report_detail_eng.asp?id=346&mag_id=111 (accessed 1.1.2010).
- Lamdan M. 1982. Kefar Menahem A. *Mitekufat Haeven, Journal of the Israel Prehistory Society* 17:52–55 (Hebrew).
- Lass E. 2003. An Early Bronze Age IB Burial Cave and a Byzantine Farm at Horbat Hani (Khirbet Burj El-Haniya) (West). *'Atiqot* 44:1–51.
- Lechevallier M. and Ronen A. 1985 *Le site natoufien-khiamien de Hatoula près de Latroun, Israël. Fouilles 1980–1982. Rapport préliminaire* (Les Cahiers du centre recherche français de Jérusalem 1). Paris.
- Lechevallier M. and Ronen A. 1994. *Le gisement de Hatoula en Judée occidentale, Israël* (Mémoires et Travaux du Centre de recherche français de Jérusalem 8). Paris.
- Levy T.E. 1998. Cult, Metallurgy and Rank Societies—Chalcolithic Period (ca. 4500–3500 BCE). In T.E. Levy ed. *The Archaeology of Society in the Holy Land*. London–Liecester. Pp. 226–244.
- Lovell J.L. 2001. *The Late Neolithic and Chalcolithic Periods in the Southern Levant: New Data from the Site of Teleilat Ghassul, Jordan* (BAR Int. S. 974). Oxford.
- Lupo R. 2008. *Mazor West: Chalcolithic Burial Caves in the Eastern Fringe of the Coastal Plain*. M.A. thesis. The Hebrew University. Jerusalem (Hebrew).
- Mallon A., Koeppel R. and Neuville R. 1934. *Teleilat Ghassul I: 1929–1932*. Rome.
- Marder O. 2009. Chazen M. and Horwitz L-K. eds. 2007. Holon: A Lower Palaeolithic Site in Israel—Reviewed by Ofer Marder. *Mitekufat Haeven, Journal of the Israel Prehistoric Society* 39: 185–189.
- Marder O., Goring-Morris A.N., Khalaily H., Milevski I., Rabinovich R. and Zbenovich V. 2007. Tzur Natan, Pre-Pottery Neolithic A Site in Central Israel and Observations on Regional Settlement Pattern. *Paléorient* 33:79–100.
- Marder O., Khalaily H., Rabinovich R., Gvirtzman G., Wieder M., Porat N., Ron H., Bankirer R. and Saragusti I. 1998. The Lower Paleolithic Site of Revadim Quarry, Preliminary Finds. *Mitekufat Haeven, Journal of the Israel Prehistoric Society* 28:21–53.
- Marder O., Malinsky-Buller A., Shahack-Gross R., Ackermann O., Ayalon A., Bar-Matthews M., Goldsmith Y., Inbar M., Rabinovich R. and Hovers E. Forthcoming. Archaeological Horizons and Fluvial Processes at the Lower Paleolithic Open-air Site of Revadim (Israel). *Journal of Human Evolution*.
- Milevski I. 2002. A New Fertility Figurine and New Animal Motifs from the Chalcolithic of the Southern Levant. *Paléorient* 28:133–141.
- Milevski I. 2007. Mazor (West). *HA-ESI* 119 (16.8.2007). http://www.hadashot-esi.org.il/report_detail_eng.asp?id=571&mag_id=112 (accessed 1.1.2010).
- Milevski I. and Baumgarten Y. 2008. Between Lachish and Tel Erani: Horbat Ptoia, A New Late Prehistoric Site in the Southern Levant. In J.M Córdoba, M. Molist, M.C. Pérez, I. Rubio and S. Martínez eds. *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East*. Madrid. Pp. 1429–1446.
- Netzer M. and Chazan M. 2007. The Geological Setting. In M. Chazan and L. Kolska Horwitz eds. *Holon: A Lower Paleolithic Site in Israel* (American School of Prehistoric Research Bulletin 50). Cambridge, Mass.

- Neuville R. 1930. Notes de préhistoire palestinienne. *JPOS* 10:114–121.
- Olami Y. 1981. *Daliya Map (31)* (Archaeological Survey of Israel). Jerusalem.
- Oren R. and Scheftelowitz N. 1998. The Tel Te'enim and Sha'ar Ephraim Project. *Tel Aviv* 25:52–94.
- Parnos G., Milevski I. and Khalaily H. This volume. Remains from the Late Prehistoric to Early Islamic Periods at the Foot of Tel Malot (East).
- Perrot J. and Ladiray D. 1980. *Tombes à Ossuaires. (Mémoires et Travaux du Centre de recherche français de Jérusalem 1)*. Paris.
- Ronen A. and Winter W. 1997. Eyal 23—A Lower Paleolithic Site in the Eastern Sharon, Israel. *Quartär* 47/48:177–188.
- Rosenberg D. and Groman-Yaroslavski I. 2005. A PPNA Bifacial Assemblage from Tel Bareqet, Central Israel. *Neo-Lithics* 1/05:24–28.
- Rowan Y. and Golden J. 2009. The Chalcolithic Period in the Southern Levant: A Synthetic Review. *JWP* 22:1–92.
- Scheftelowitz N. and Oren R. 2003. Giv'at ha-Oranim: A Chalcolithic Site in the Lodian Shephelah. *Qadmoniot* 126:89–93 (Hebrew).
- Scheftelowitz N. and Oren R. 2004. *Giv'at ha-Oranim: A Chalcolithic Site* (Salvage Excavation Reports 1). Tel Aviv.
- Shalem D. 2003. *The Chalcolithic Period Sites in the Mountains of the Galilee—Settlement Distribution and Ceramic Characteristics*. M.A thesis. Haifa University. Haifa (Hebrew).
- Tal O. 2000. Tel Hamid, Lower Terrace. *ESI* 20: 92*–93*.
- Tal O. and Blockman N. 1998. A Salvage Excavation at Tel Hamid (The Lower Terrace). *Tel Aviv* 25:142–173.
- Winter Y., Neber A. and Ronen A. 1999. The Lower Paleolithic Site Eyal 23 (Israel), 1997 Excavation. *Terrestrische Quartärgeologie* 1:466–475.
- Yannai E. Forthcoming. *Natzur 4: An Early Chalcolithic Site East of Kibbutz Barkai, Israel*. Manchester.
- Zbenovich V. 2006. Salvage Excavations at a Pre-Pottery Neolithic Site at Modi'in. *'Atiqot* 51: 1–14.
- Zbenovich V. Forthcoming. Excavations at the Early Neolithic (PPNA) Site of Qula; Site 203. *'Atiqot*.