

CITY AND ITS COUNTRYSIDE. AN ARCHAEOLOGICAL-CARTOGRAPHICAL APPROACH

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1. The boundaries of the countryside of caesarea maritima

The rural boundaries (*territorium*) of a city are to be determined by the geophysical features (Fig. 1), taking into consideration also the available literary sources pertaining to its geographical-history. Archaeological finds, such as milestones and dated inscriptions with the city era, are of course also relevant.¹ There is no consensus among scholars concerning the rural boundaries of Caesarea. There are decisive differences in the maps drawn by Avi-Yonah,² Notley and Safrai,³ Faust

and Safrai⁴ and Holum,⁵ overlaid on TIR map⁶ (Fig. 2). According to Notley and Safrai, referring to the borders as traced in Eusebius' *Onomasticon*, Naḥal Alexander marked the southern border, separating the region of Caesarea from that of Apollonia. According to Avi-Yonah, followed by Holum, it was Naḥal Poleg (*Bdelopotamos*), located farther south. In the north, Avi-Yonah set the border line between Caesarea and Dor / Dora in Haḥal Daliya (*Chorseos Flumen*), while Notley and Safrai included Dor in the region of Caesarea, extending it as far as the region of Acre / Ptholemais. Not so in Faust and Safrai. Unlike Avi-Yonah, Holum proposed that Ḥorvat Sumaqa and the entire Lower Carmel were included in the boundaries of Caesarea, forming its northern border. He included within also Elyaqim in the NE, Umm Reiḥan in the E and Tur Karem / Birat Sorqa in SE. The extension east-

1. This issue was recently discussed by Holum. See: Kenneth G. HOLUM, «Caesarea *Palaestinae*: City and Countryside in Late Antiquity», in Joseph PATRICH, Orit PELEG-BARKAT and Erez BEN-YOSEF (ed.), *Arise, Walk through the Land. Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of his Demise*, Jerusalem, The Israel Exploration Society, 2016, p. 1-16.

2. See the map attached to Michael AVI-YONAH, *Historical Geography of Palestine*, Jerusalem, Jewish Palestine Exploration Society, 1951, rev. and augmented 1962 (Hebrew), and *Atlas of Israel*, Jerusalem, Department of Surveys, Ministry of Labour and the Bialik Institute, the Jewish agency, 1956, Sheets IX/10a and d, IX/11c.

3. Map attached. R. Steven NOTLEY and Ze'ev SAFRAI, *Onomasticon: the place names of divine scripture: including the Latin edition of Jerome / Eusebius, translated into English and with topographical commentary (Jewish and Christian Perspectives Series 9)*, Boston, Brill, 2005. See also: G.S.P. FREEMAN-GRENVILLE, Rupert L. CHAPMAN and Joan E. TAYLOR, *Palestine in the Fourth Century*.

The Onomasticon by Eusebius of Caesarea, Jerusalem, Carta, 2003 (Eng. tr. of Eusebius, *Onomasticon*).

4. Avraham FAUST and Ze'ev SAFRAI, *The Settlement History of Ancient Israel: A Quantitative Analysis*, Ramat Gan, 2015 (in Hebrew).

5. Kenneth G. HOLUM, «Caesarea *Palaestinae*: City and Countryside in Late Antiquity», p. 1-16.

6. TIR = *Tabula Imperii Romani. Iudaea-Palaestina. Maps and Gazetteer* (Yoram TSAFRIR, Leah DI SEGNI and Judith GREEN (ed.), *Tabula Imperii Romania Iudaea-Palaestina: Eretz Israel in the Hellenistic, Roman and Byzantine Periods. Maps and Gazetteer*, Jerusalem, Israel Academy of Sciences and Humanities, 1994).

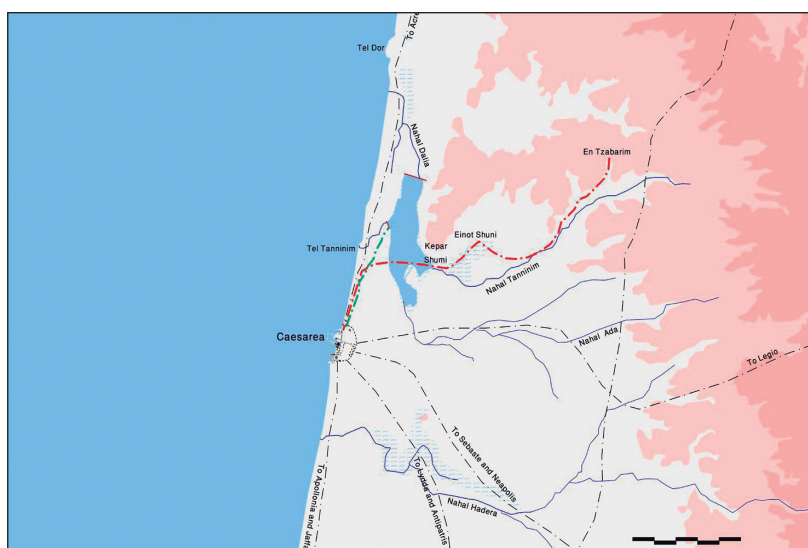


FIGURE 1. Topographical map of Caesarea and its region, depicting the roads, aqueducts and Tanninim Lake (Cartography: Jean Mesqui).

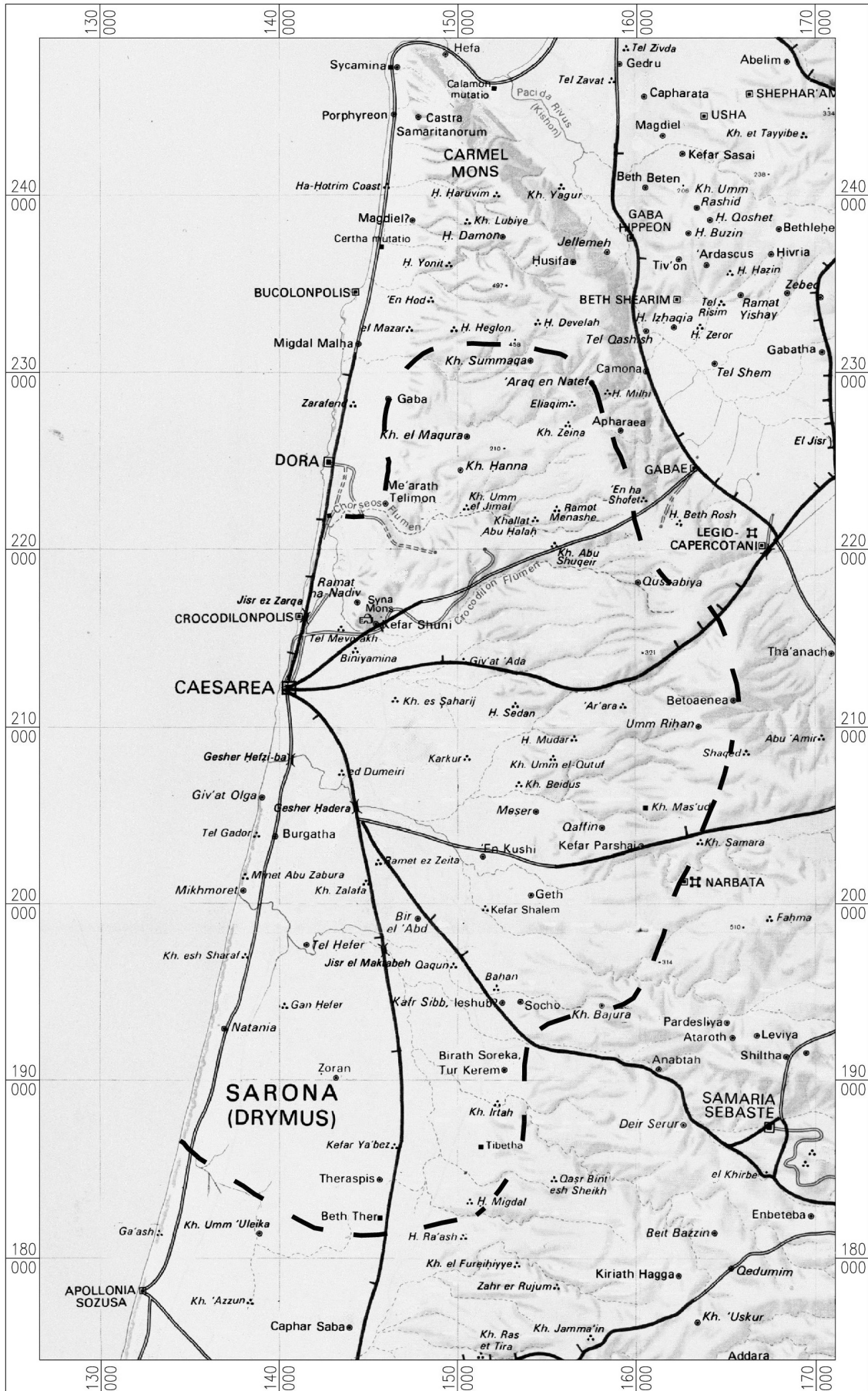


FIGURE 2. Kenneth G. Holm's map of the administrative region (territorium) of Caesarea (Cartography: Joseph Patrich, based on TIR map).

ward in both Avi-Yonah's and Holum's maps is much vaster than that in Safrai's maps.

The area marked by Holum encompasses ca. 900 sq. km. He opined that the area included 100-120 villages. In the *TIR* map only 54 villages, 4 forts and 9 farmsteads are marked within these confines. Wine and oil presses and other installations uncovered in the Survey Maps (see below), were not marked on the *TIR* map. Seemingly, some of them indicate farmsteads. From the Rabbinic sources we know that six of these villages, of Jews or Samaritans, were producers of wine. These were Ogdor or *Gidra shel Qisrin*, Burgatha (Kh. Ibreiktas), Kefar Parshai (Firasin?), Birath Soreqa (Tulkarm?), 'En Kushi (H.. Kosit, Kh. Kusiya) and Kefar Shalem (Kh. el Jelleme).⁷

2. The Geo-Physical features of the countryside of caesarea maritima

The *territorium* adopted here is that of Holum (Fig. 2). Extending between Naḥal Dalya in the north and Naḥal Poleg in the south, it is delineated by the Mediterranean on the west and western Samaria Hills on the east. It included the Lower Carmel—the southern part of this ridge, part of the Manasseh Heights—as far east as its watershed, the northern foothills of Samaria, and the northern Sharon Plain. Administratively, the territory of Caesarea (including that of Nabatha) reached the boundaries of Samaria-Sebaste on the east and those of Antipatris and Apollonia on the southeast and south, respectively.

Northern Sharon is delineated by the foothills of the Samaria Hills on the east. Getting gradually narrower from south to north beyond the coastal plain, it comprises three parallel N-S geomorphological strips, each ca. 5-6 km wide. On the west, parallel to the coastal plain, are three N-S *kurkar* ridges with narrow valleys in between, the western one being the 'trough'. These *kurkar* ridges, in which many quarries were cut in antiquity, are breached by four riverbeds (from south to north): Naḥal Poleg, Naḥal Alexander, Naḥal Ḥadera and Naḥal 'Ada. They form broad alluvial valleys of fertile soil, several kilometers wide. These valleys, less than 10m a.s.l. in elevation, have poor drainage and tend to become swampy. Drainage operations along the wadis courses and near their outlets to the Mediterranean restricted the extent of the marshes. Some of these had been infested with crocodiles since ancient times, as is attested by Strabo⁸ and Pliny,⁹

7. The sites identifications are following *TIR*.

8. *Geographia* XVI, 2, 27, in: STRABO, *The geography of Strabo*, vol. VII, trans. by Horace Leonard JONES, London, William Heinemann Ltd., 1954, p. 274-275.

9. Pliny the Elder, *Historia Naturalis*, V, 17; 75. PLINY, *Natural History*, vol. II, ed. by Harry Rackham, London, William Heinemann Ltd., 1961, p. 278-279.

who speak about *Crocodilon polis* and *Crocodilon flumen*, identified with Tell Tanninim and Naḥal Tanninim to the north of Caesarea. From the late third—early fourth century CE onward (under Diocletian and the Tetrarchy), the marshy area of Naḥal Tanninim (later known as the Kabara Swamps), were flooded by an artificial lake created by damming it and Naḥal 'Ada (Fig. 1). The lake extended from the foothills of the Carmel ridge on the east to the western *kurkar* ridge, running parallel to the seashore. This artificial lake and the southern part of Mt. Carmel marked the northern extremity of Caesarea's hinterland. Sand dunes penetrated inland through the outlets of the wadis, and the breaches in the *kurkar* ridges. During the Roman and Byzantine periods, the dunes were more restricted in area than they became in more recent times.

The intermediate strip of the Sharon comprises hills of *ḥamma* (red sand, which also covers the easternmost of the three *kurkar* ridges; hence its name, 'the red ridge'). The elevation of this ridge is 50-80 m a.s.l. in the north and 60-90 m a.s.l. in the south. Oak woodland, known as *Drymos*,¹⁰ extended over the red sandy soils, covering ca. 60% of the Sharon area. The red ridge (like the dunes) is not arable but is good for pasture; it was also inhabited by wildlife.

The eastern strip, known as the 'gutter' (*marzeva*), with an elevation of less than 60 m a.s.l., is the flat plain that reaches the foothills of the Samaria Hills. Its well-drained, fertile soil is alluvial, deposited by the rivers streaming down from the hilly country. Until modern times this area, 10-12 km and more distant from Caesarea and the coast, was the most densely populated strip of the Sharon (second in its density of population was the 'trough').¹¹

The Sharon was known from early times as a land

10. This term is used by the LXX as a translation for the Sharon in Isa. 65:10. According to Strabo (*Geographia* XVI, 2, 27 [STRABO, *The geography of Strabo*, p. 274-275]; Menahem STERN, *Greek and Latin Authors on Jews and Judaism*, vol. I, Jerusalem, Israel Academy of Science and Humanities, 1974, p. 290-292), the large forest (*megas drymos*) extended south of the Carmel range as far as Jaffa. It is also mentioned by Flavius Josephus (*War* I, 250 [JOSEPHUS, *The Jewish War*, vol. II, trans. by Henry Sant John Thackeray, London, William Heinemann Ltd., 1956, p. 116-117]; *Ant.* XIV, 334 [JOSEPHUS, *Jewish Antiquities*, vol. VII, trans. by Ralph Marcus, London, William Heinemann Ltd., 1957, p. 624-627]).

11. The above brief geographical survey is based on: Yehuda KARMON, «Geographical Conditions in the Sharon Plain and their Impact on its Settlement», *Bulletin of the Israel Exploration Society* (Jerusalem), vol. 23 (1959), p. 111-133; Menashe HAR-EL and Dov NIR, *Geography of the Land of Israel*, Tel Aviv, Am Oved, 1969, p. 326-332 (Hebrew); Meir ASAF, «The Sharon. Geomorphology», in Arieḥ YITZHAKI (ed.), *Israel Guide. Sharon, Southern Coastal Plain and Northern Negev*, Jerusalem, Keter Publishing House and Ministry of Defense, 1979, p. 3-5 (Hebrew). The surroundings of Caesarea could easily become marshy if the drainage of its wadis was not regularly maintained.

of wheat.¹² This characterization, however, seems to refer more to its more fertile southern part, beyond the hinterland of Caesarea. Due to its non-arable soil and poor drainage, most of the northern Sharon, nearer to Caesarea, was unsuitable for agricultural settlement, despite the fact that the mean annual precipitation rate is 500-600 mm. The richest springs are those of Naḥal Tanninim. The groundwater is at a depth of 80-20 m below ground level, deeper in the east than in the west; in Caesarea it is closer to the surface.

The Sharon was also known as a land of good pasture (Isa. 65:10; I Chron. 27:29-31; *Baba Qama* 10:9; *Tosefta, Menah. ot* 9:13): one of King David's treasurers was in charge of the herds that grazed in the Sharon (I Chron. 27:29), and most of the calves sacrificed in the Jerusalem Temple came from this region (*Mishnah, Baba Qama* 10:9; *Tosefta, Menahot* 9:13). Hence, Caesarea, open to the sea, was also well provided with agricultural produce. In both the city and its hinterland 'prices are low, there abundance obtains' (TY, *Kelaim* 9.4, 32c — ed. Heinrich W. Guggenheimer; *Ketubot* 12.3, 35b, second half of third century). It was 'a pleasant city and rich in everything'.¹³ Two Christian inscriptions found in a suburban villa to the north of the city, are quotations from the LXX of Deut. 7:12-13 and Ps. 4:8, asking for God's blessing on the corn, wine and oil.¹⁴

Samaria Foothills / Western Samaria: As was indicated above, on the east Holum included Umm Reiḥan (ca. 425m a.s.l.), 25 km distant from Caesarea, within its territory and likewise Tur Karem / Birat Sorqa, in SE. This region comprises east-west extensions descending west to the Sharon and drained by Naḥal Ḥadera and Naḥal Alexander. The average annual precipitation rate is less than 600mm.

Manasseh Heights: Forming the NW extension of the Samaria Hills, Manasseh Heights comprises of moderate hills with an average elevation of 250m a.s.l., descending abruptly on the east to the Izrael Valley. Geo-physically it is a syncline ca. 12.5 km wide, extending from NE to SW between Naḥal Yoqne'am (flowing to NE) and Naḥal Thuth (flowing to SW) in the NW and Naḥal 'Iron (flowing to SW) in the SE. The average annual precipitation rate is more than 600mm. It is drained by the rivulets of Naḥal Daliya, Naḥal Tanninim and Naḥal 'Ada. Holum included

Elyaqim (214m a.s.l.) within the territory of Caesarea, in the NE. The site is located on the highest point of Manasseh Heights, near the northern end of its watershed. The Elyaqim — 'En HaShophet road runs along this watershed, marking the NE border of Caesarea territory.

Southern Carmel: Farther north, triangular in area, Mount Carmel is running from SE to NW. Its southern part comprised of 'Lower Carmel' (with an average elevation of ca. 200m a.s.l.) and the southern part of 'Middle Carmel', extending to its NE. As was noted above, Holum proposed that Ḥorvat Sumaqa and the entire southern Carmel were included in the boundaries of Caesarea, forming its northern sector. On the west it descends steeply to the Mediterranean and on the east to the Zebulun and Izrael Valleys. The landscape, much forested, is moderate and even level, with vast valleys. Ramat HaNadiv (see below), forms its southern extension. The annual precipitation rate is above 600mm. It was populated by Jews, Samaritans and by few Christians.¹⁵

Roads: A network of five Roman roads connected Caesarea with its hinterland and with inland cities (Figs. 1-2). The road running north led to Ptolemais/Acre; that running south led to Apollonia/Arsuf. In the Roman period it ran along the westernmost kurkar ridge; in the Byzantine — it was shifted to the east of the middle kurkar ridge, along the present asphalt road. That running northeast led to Gabae; and that running east to Maximianopolis through the land of the Samaritans and thence to Scythopolis/Beth Shean — an important tract of the Via Maris. The road running southeast split into three branches: the first led eastward through the land of the Samaritans to Ginae and thence to Scythopolis, the second led southeast to Samaria/Sebaste and thence to Neapolis/Shechem, both located in the heart of Samaria and the third led south, along the 'gutter', to Antipatris and Diospolis/Lydda. It served as a main traffic artery of the *cursus publicus*. Each of these roads had the official status of *via publica*; it was paved, marked with milestones (some of which uncovered), and dotted with official road stations (*mansiones* and *mutationes*).¹⁶

15. Kuhn recorded 357 archaeological sites on Manasseh Heights and Mt. Carmel at large, 253 of them Roman-Byzantine. A part of this area extends beyond the territory of Caesarea. See: Hans Peter KÜHNEN, *Studien zur Chronologie und Siedlungsarchäologie des Karmel (Israel) Zwischen Hellenismus und Spätantike*, Wiesbaden, Reichert, 1989.

16. See the folded map of roads in *TIR* and the maps in Israel ROLL and Etan AYALON, «Highways and Roads in the Sharon Plain During the Roman and Byzantine Periods», *Israel — People and Land. Eretz Israel Museum Yearbook* (Jerusalem), vol. 4, num. 22 (1986-87), p. 147-162 (Hebrew). See also: Israel ROLL, «Roman Roads to Caesarea Maritima», in Avner RABAN and Kenneth G. HOLUM, *Caesarea Maritima. A Retrospective after Two Millennia*, Leiden-New York-Köln, Brill, 1996, p. 549-558, Fig. 1. These

12. Thus, for instance, in the Phoenician inscription on the sarcophagus of Eshmunezer II, king of Sidon (fourth century BCE). For a photograph and a drawing with an English translation see: <http://bet-ilm.blogspot.co.il/2012/03/inscription-upon-sarcophagus-of-king.html>.

13. Jean ROUGÉ (ed.), *Expositio totius mundi et gentium*, Paris, CERF, 1966, p. 26, 160-161, fourth century.

14. Walter AMELING et al. (ed.), *Corpus Inscriptionum Iudaeae/Palaestinae: A multi-lingual corpus of the inscriptions from Alexander to Muhammad*, vol. II, Berlin-Boston, De Gruyter, 2011, p. 96 (doc. 1172-1173), late fifth century.

3. The archaeological data: the Survey Maps (figs. 3-4)

The rural hinterland of Caesarea holds thirteen 10 × 10 square kilometers 'Survey Maps'; some of them only partially.¹⁷ Seven of the maps were already published as hard-copy books and are available also on-line, electronically. Other four are available at the moment only electronically on the web site of the Survey of Israel; one is not available yet.¹⁸

Like the city itself, the countryside much flourished following its foundation by Herod, in the Roman period and even more so in the Byzantine period (with 406 and 546 sites respectively), relative to the 88 sites of the Hellenistic period. In the Early Arab period, when Caesarea ceased to function as a provincial capital and had much shrank in size, the countryside also underwent a decisive decline, with only 97 sites. This decline is also resonated in the Early Muslim sources, according to which following the conquest

TABLE 1: *Number of sites in the 13 Survey Maps* (Table: Joseph Patrìch)

	'Atlit (26)	Yagur (27)	Dor (30) ¹⁹	Daliya (31) ²⁰	Binyamina (48)	Regavim (49)	Mikhmoret (52) ²¹	Ḥadera (53)	Ma'anit (54)	Netanya (56) ²²	Kfar Yonah (57)	Tul Karem (58)	Even Yehuda (59) ²³	Total
Hel.	–	–	5	7	7	36	3	5	5	4	6	8	2	88
Rom.	–	50	34	26	90	111	12	38	2	17	10	6	10	406
Byz.	1	10	49	57	88	87	18	69	65	13	26	21	42	546
E. Ar.	1	–	2	4	19	26	3	10	11	2	10	5	4	97

roads are also depicted on the *Tabula Peutingeriana*. For the roads to Maximianopolis, see: Yotan Tepper, «19 miles from...: A Roman Road from Legio to Caesarea via Ramat Menasheh», in Etan AYALON and Avraham IZDARECHET (ed.), *Caesarea Treasures*, vol. 1, Jerusalem, Mekhon Avshalom, 2011, p. 257-274 (Hebrew). As for the milestones, see: <<http://ms.kinneret.ac.il/en>>.

17. In the framework of The Archaeological Survey of Israel, on behalf of the Israel Antiquities Authority (IAA), the country was divided into 10x10 km squares, each forming a 'Survey Map'. All archaeological remains encountered in the field survey, ranging from simple installations such as a threshing floor, an oil or wine press, a water cistern, a stone quarry, or dispersed flint tools or pottery sherds on the ground, are recorded and marked on the map. The results were published in hard copies as Survey Books, and more recently, electronically, on the bilingual (Hebrew-English) web site of the Survey of Israel (<http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.80852508545,31.298049926757;mapname=32>). Each map was designated a number. Generally, each map was surveyed by a different team; not all with similar intensity; not all followed the same standards and not all reached the stage of final publication. The eastern most zone of Caesarea countryside (areas that were to be included in Maps nos. 50 and 55) is at present within the confines of the Palestinian Authority; it was never under the IAA jurisdictions and hence never included in the Survey of Israel Maps.

18. No information concerning Map 60, located to the east of No. 59, was accessible to me.

19. Not all sites in Dor Map are included in the territory of Caesarea. The total Hellenistic sites in this map is 18; Roman — 90; Byzantine 118; Arab — 7.

20. More than half of the sites in Daliya map are outside the territory of Caesarea. The total Hellenistic sites in this map is 9; Roman — 31; Byzantine 70; Arab — 6. The map was surveyed by Olami in the years 1970-71.

21. The major part of this 10 × 10 km map is in the sea.

22. Much of this 10 × 10 km map is in the sea.

23. Part of this 10 × 10 km map is in the sea and more than half of its sites, located to the south of Naḥal Poleg, are outside the territory of Caesarea. The total Hellenistic sites in this map is 11; Roman — 33; Byzantine 69; Early Arab — 15.

the lands around the city were known to be swampy, not recommended for settlement.²⁴ Seemingly, the lengthy years of the siege (634-640/41 CE), resulted in negligence of proper drainage of the streams and the fields.

Most of the Survey Maps in the hinterland of Caesarea provide only meagre information about each individual site. The surveys of Olami (Maps 30 and 31), and of Neeman (Maps 52-54) were carried out decades ago, when the survey methodology and the publication of the results were by far pre-mature.

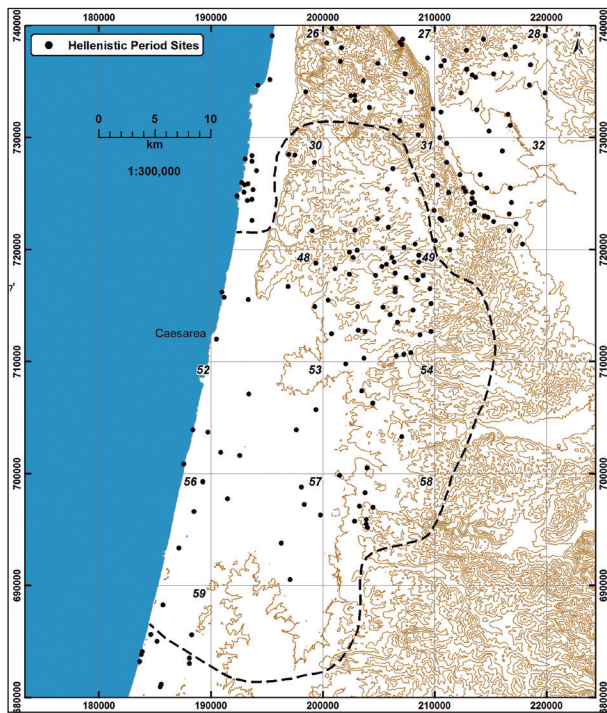
The most recent survey was conducted in **Regavim Map** (no. 49),²⁵ published by Gadot and Tepper, located to the east of Binyamina Map (no. 48),²⁶ in which Caesarea is included. 36 sites in Regavim Map are Hellenistic, 111 Roman, 87 Byzantine and 26 Early Arab. According to the introduction chapter, pertaining to the Roman and Byzantine periods, more than a third of the 111 Roman sites were settlements, but their names are not listed as a group, and they are not

24. Meir Jacob KISTER, «The Battle of the Ḥarra, Some Socio-Economic Aspects», in Myriam ROSEN AYALON (ed.), *Studies in Memory of Gaston Viet*, Jerusalem, The Hebrew University of Jerusalem, 1977, p. 43-449; Amikam EL'AD, «The Coastal Cities of Eretz-Israel in the Arab Period (640-1099) on the Basis of the Arab Sources», *Cathedra* (Jerusalem), vol. 8 (1978), p. 163.

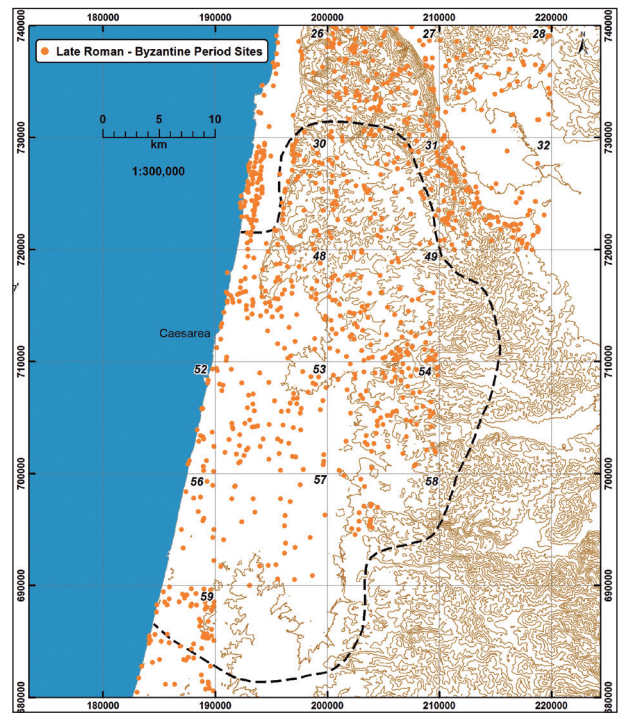
25. Map of Regavim (49): Yuval GADOT and Yotam TEPPER, *Regavim Map (49)*, Jerusalem, Israel Antiquities Authority, 2009 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=7.0000;xy:36.162590026856,32.32571606444;mapname=49>.

26. Map of Binyamina (48): Ya'aqov OLAMI, Shlomo SENDER and Eldad OREN, *Binyamina Map (48)*, Jerusalem, Israel Antiquities Authority, 2005 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.80852508545,31.298049926757;mapname=48>.

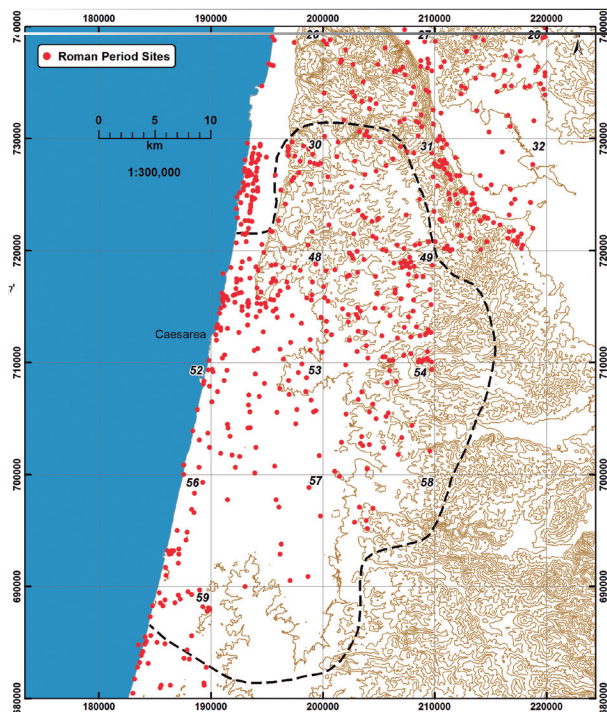
a. The Hellenistic period.



c. The Byzantine period.



b. The Roman period.



d. The Early Arab period.

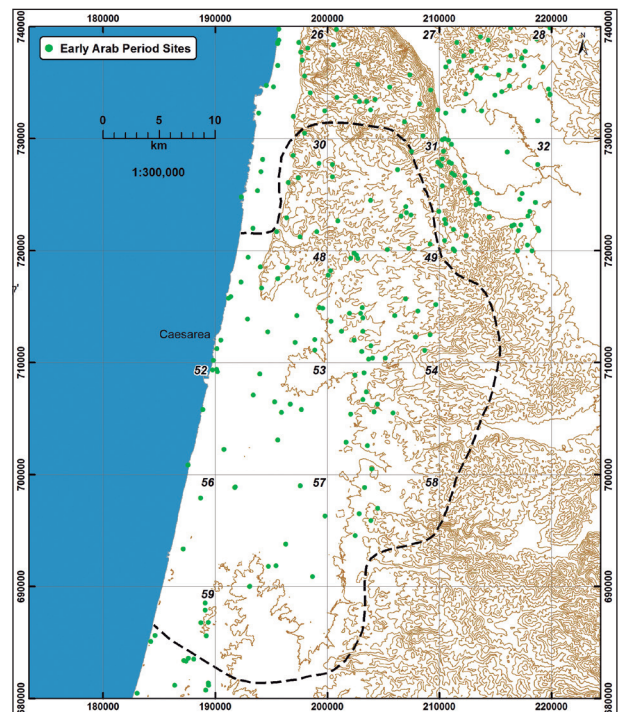
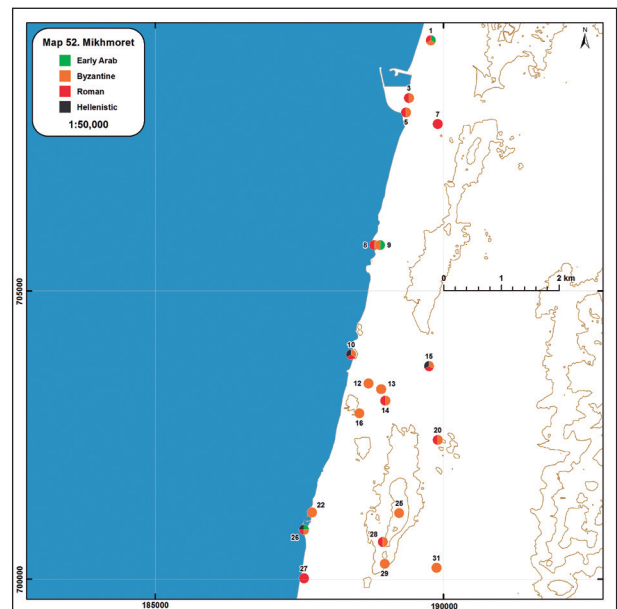
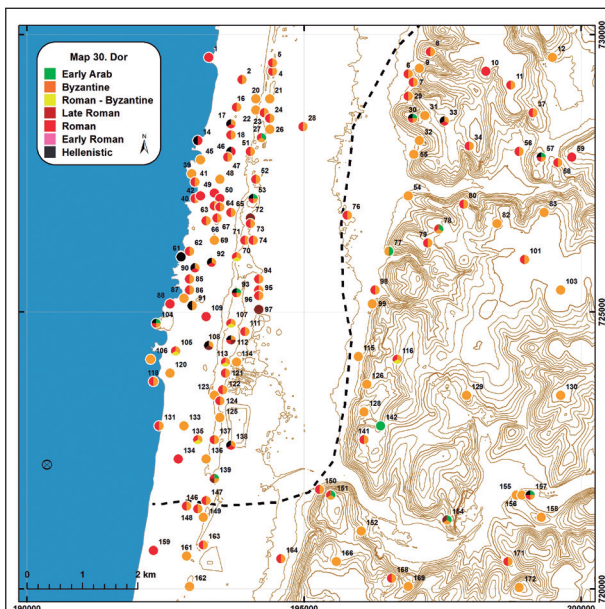
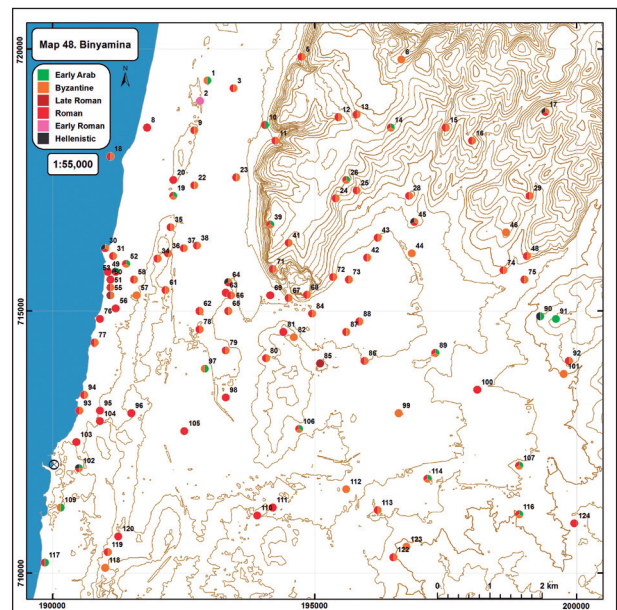
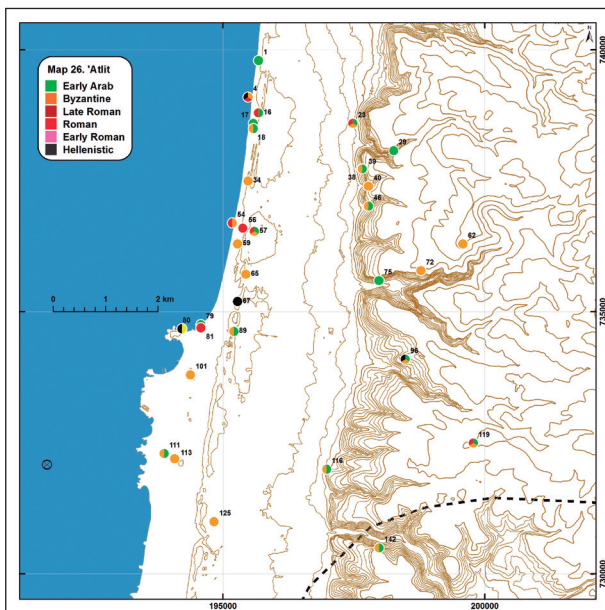


FIGURE 3. Integrative maps of the Survey Maps in the territorium of Caesarea (Cartography: Mitia Frumin, based on data provided by Dr. Michal Birkenfeld and Dr. Ofer Sion IAA).

sorted according to size categories: big, medium-size or small villages, farmsteads etc. Hence, only periods can be presented on the map (Fig. 4); not size category, or site typology. There are neither aerial photographs nor detailed maps or plans of any settlement. The actual pattern of the rural settlement is thus quite vague. It is not clear which were the major villages; neither is

it possible to associate a farmstead, or isolated agricultural installations with this or that village. The settlement pattern pertaining to the Byzantine period is even more vague. It was not clearly indicated how many of the 87 documented sites are settlement remains (40?), and how many should be considered as installations. As for the farmsteads, the introductory

a. The western band.



discussion is more detailed, but the description of each farm is laconic. Such is also the case with the other Survey Maps (Fig. 4), in which the documentation is even more laconic.

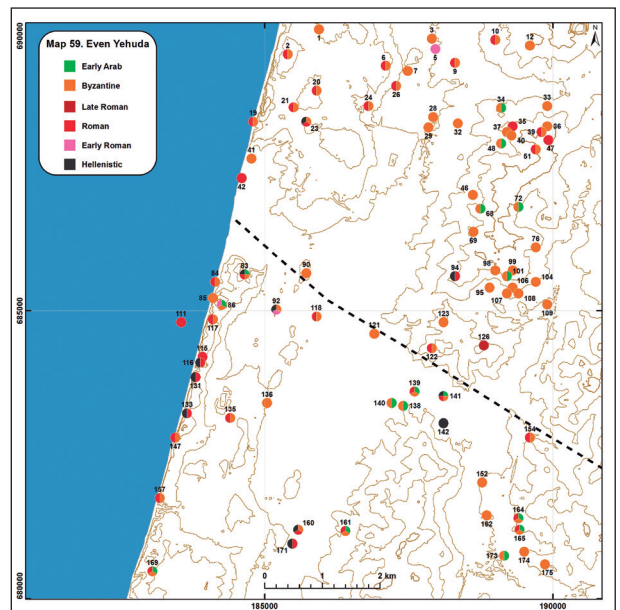
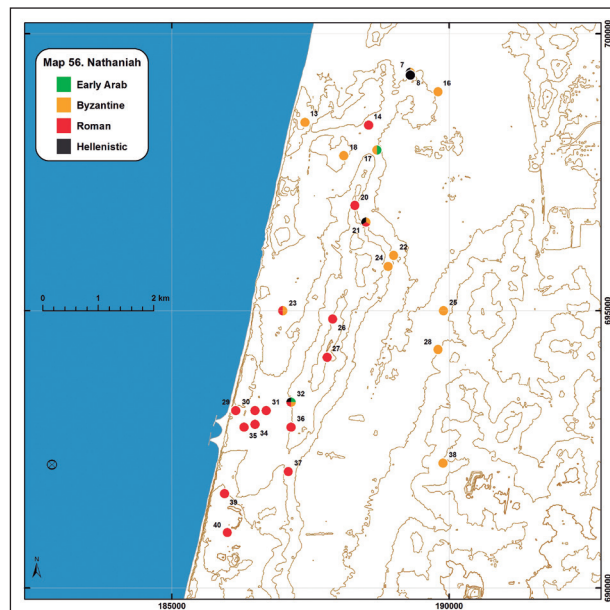
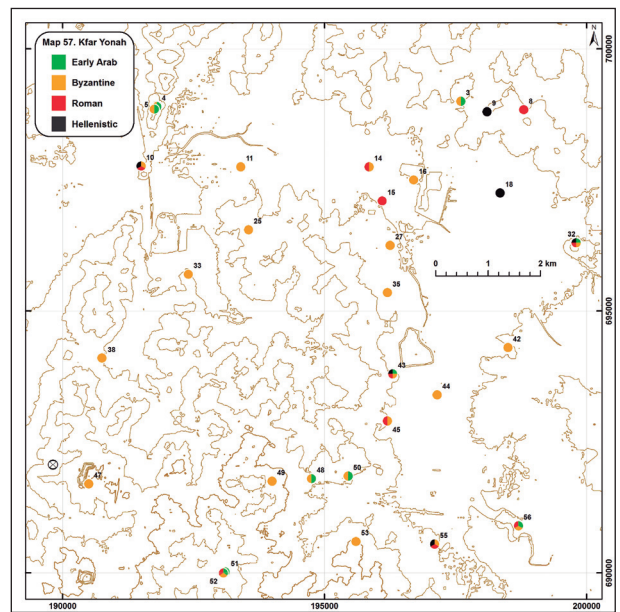
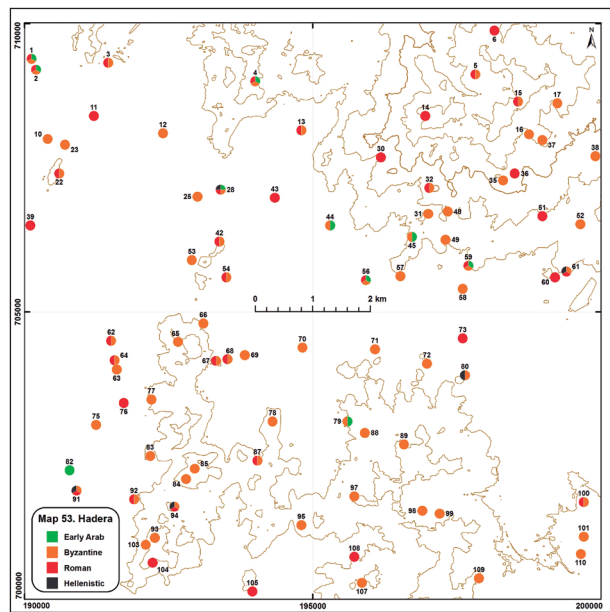
Extracting sites identified as settlements rather than installations or other non-settlement sites from the total number of sites listed in the Survey Maps, yields these results:

—**Dor Map (30):**²⁷ Only 5 sites of this Map, located within the confines of Caesarea were attributed to the

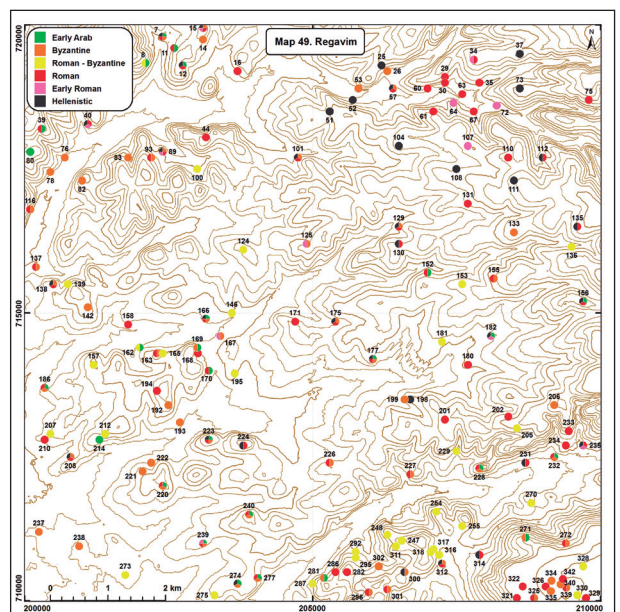
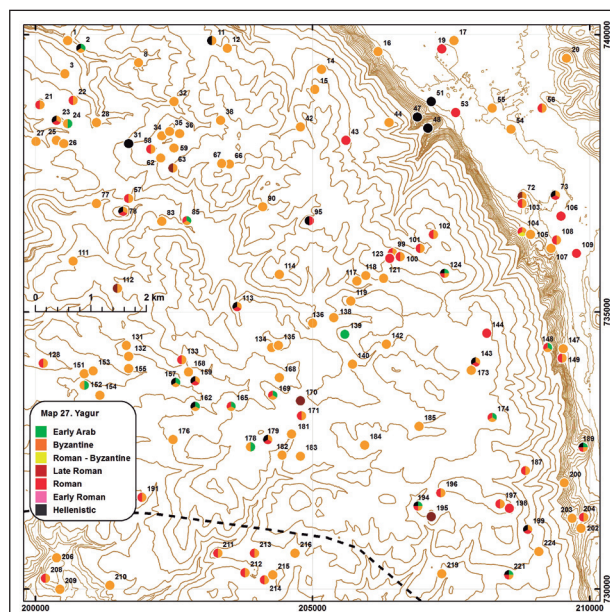
Hellenistic period, 34 are Roman, 49 Byzantine and 2 Early Arab. Only 25 of the Roman and Byzantine sites can be considered as settlement remains. Their size is not always provided. Such is, for example, Kh. Umm et Tut (site no. 157), defined as a densely built village from the Byzantine period, and also, perhaps, from the Early Arab period. Many of these ancient settlements are located within Arab villages, some of which being deserted in the 1948 war. Such are: Jab'a (29), H. Nezer (55), H. Hanuna (130), el Fureidis (141), Kh. Shefeya (154). The largest among those for which dimensions are provided are Kerem Maharal / Ijzim (30 dunams), 'Ein Ghazal (25d.), H. Tate (18d.) and H. Shiy'a west (15d.). Giv'at Shana (59), is 13d. in size; Tell 'Avdan (162) is a tell 10d. in dimensions and such is also the size of Bir el

27. Map of Dor (30): Ya'aqov OLAMI, Shlomo SENDER and El-dad OREN, *Dor Map (30)*, Jerusalem, Israel Antiquities Authority, 2005 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.9442181525,32.528960067;mapname=30>.

a. The western band.



b. The eastern band.



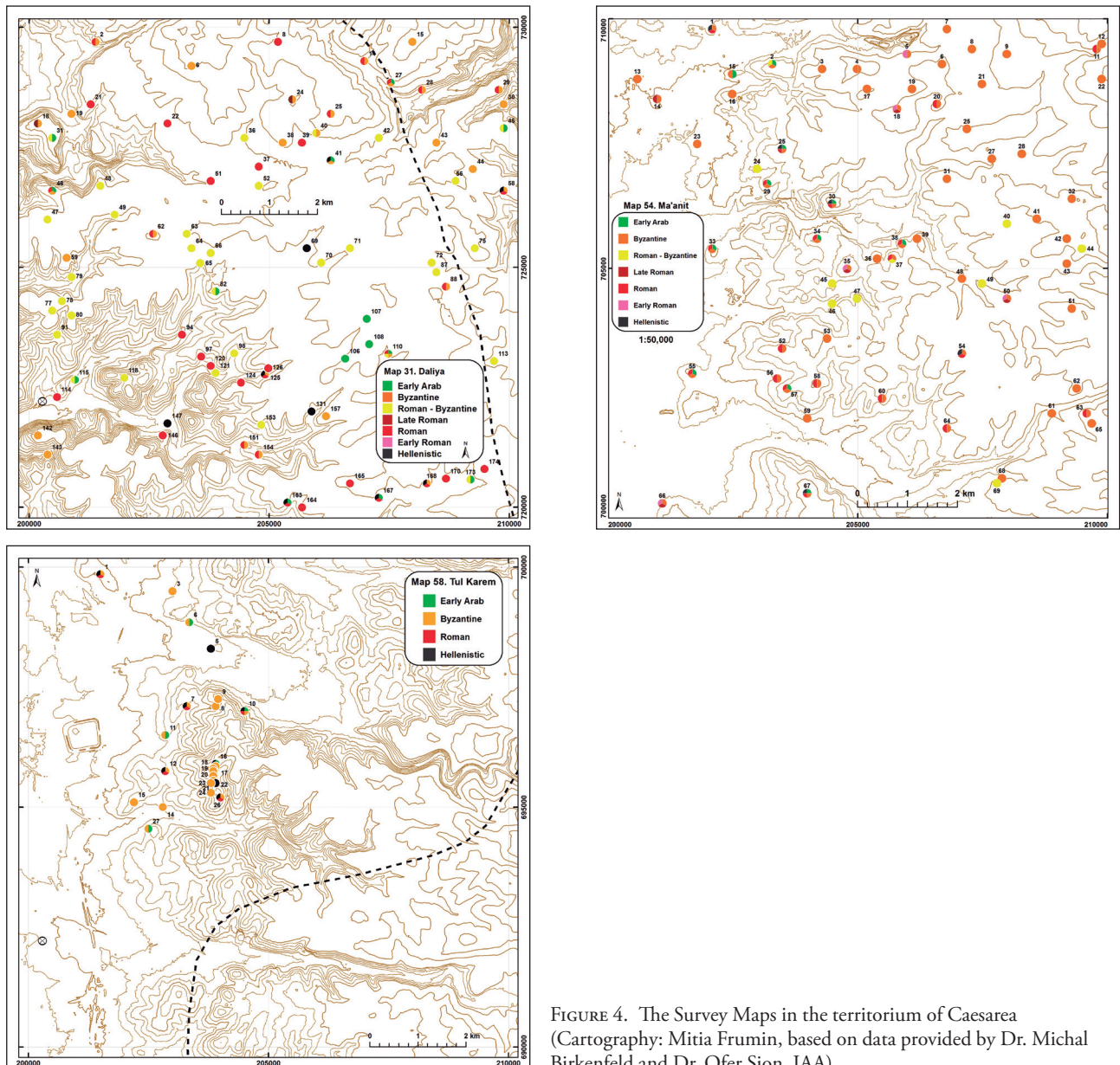


FIGURE 4. The Survey Maps in the territorium of Caesarea (Cartography: Mitia Frumin, based on data provided by Dr. Michal Birkenfeld and Dr. Ofer Sion, IAA).

Tata (171). Other sites, of ca. 5d. or smaller, perhaps farms, are nos. 30 (3d.), H. Shimray (no. 77 -4d.), 82 (3d.), 164 (5d.), 168 (5.6d.) and 169 (3d.). Burials were recorded in 21 sites; quarries in 5 sites; aqueducts in 4 sites, including a dam (no. 161); and there are two concentrations of road milestones (29 and 159)—where six of them were assembled).

—**Daliya Map (31):**²⁸ Out of the total 101 Roman and Byzantine sites, 20 were large settlements; the others—smaller. The major settlements were Ḥorvat Nagos (62), Ḥorvat Qeṭina (63). Kh. el-Buweida (71) and un-named sites nos. 65, 66, 70, 94, 97, 99, 124 and 125. Naḥal Ḥaggit farmstead, within the confines

28. Map of Daliya (31): Ya'aqov OLAMI, *Daliya Map (31)*, Jerusalem, Israel Antiquities Authority, 1981 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.9439576385,32.6191320115;mapname=31>.

of Caesarea (see below), is the un-named site no. 82 in this Survey Map.

—**Binyamina Map (48):**²⁹ Seven out of the 124 map sites, among them Straton's Tower—the town that preceded Herodian Caesarea, are dated to the Hellenistic period. 89, including Caesarea, to the Roman period and 86 are Byzantine. Only 27 of them, including Caesarea (nos. 102, 103, 109), are settlements of different sizes (which are not always provided; no maps or aerial photos of them are given): the pottery sherds of site no. 71 extend over 80d.; site no. 26 is of 22.5 d.; 2 sites (nos. 28 and 45), are of 20 d.; 1 (no. 74), of 15 d.; 1 (no. 91 - Ḥ. Defes), of 10 d.; 3

29. The map was first surveyed by Olami in 1972-73. This was renewed in 1996 by Sender and Oren. Caesarea and much of its aqueducts as well as Ramat HaNadiv (see below), are within the confines of this Survey Map.

(nos. 44, 77, 99 - Tel Duddaim), of 6-5 d., 4 smaller than 3 d. and 2 - half a dunam in size (a fort). No dimensions were provided for the other 16 sites, among them Kafr Shuni (72), H. 'Egem (90), Kh. Abu Shushe (92), H. Hiddot / Kh. Hudeidun (112) and Kh. Şaharij (122). The larger sites (of 22.5 and 15-20 d.), are located to the east of Ramat HaNadiv, in the fertile foothills of Manasseh Heights. They include site no. 48, to the north of Aviel, Kefar Shuni (no. 72), H. Hiddot / Kh. Hudidun (112), Kh. Şaharij (122), all more than 5 km distant from Caesarea. Likewise, site no. 71, located in cultivated fields, scattered over 80 d., which is located to the SE of Ramat HaNadiv. 'Large' sites along the shore are Tel Tanninim (no. 30; 2 d.; perhaps a monastery), Tel Tadvira (no. 77; 5 d.; a monastery?). Burials of all sorts were recorded in 24 sites; quarries (one of them —no. 35— extending over 150 d., another —no. 61— over 50 d.)—in 12 sites; 8 sites are associated with roads, including bridges (nos. 19, 31), and milestones (nos. 49, 50, 76, 100). 22 sites are related to aqueducts, including two dams (nos. 3 and 19). 4 sites could be identified as farms (see also below); these are sites nos. 25, 39, 52? and 120. 19 sites in Binyamina Map are dated to the Early Arab period.

—**Mikhmoret and Hadera Maps (52 and 53)**:³⁰

Eight Hellenistic sites were recorded in both maps. The most important are Tel Gador (12), Kh. Ibreiktas (15) and Tel Mikhmoret (26) in **Mikhmoret Map**, and 5 more sites (nos 28, 61, 80, 91, and 94), in **Hadera Map**. 50 Roman sites were recorded in both maps. The major sites are Tel Mikhmoret and Kh. Ibreiktas (no. 26 and 15, respectively, in **Mikhmoret Map**), and Tel Zomera (no. 28 in **Hadera Map**), where a watch tower was recorded. As to the Byzantine period: 87 sites were recorded in both maps, the more important among them in **Hadera Map** are at the foot of Tel Zomera (28), Kh. es Sarkas (57; 4.2 d.), Site no. 63 — extending over 5 d., site no. 64, extending over 10 d., Gan Shmuel 44, 150 × 250m in dimensions (=37.5 d.!), on a hill, including an oil press— presumably a large farm or a village, Tell Afrein / 'Ifrein (61 —on a red soil [*hamra*] hill, 30 d. in size); and in **Mikhmoret Map**: Tel Gador (10 —on top of a hill cut by the sea), Kh. Ibreiktas (15), Tel Girit (21) and Tel

Mikhmoret (26 —on top of a hill cut by the sea). 13 sites dated to the Early Arab period were recorded in both maps, 10 of them in **Hadera Map** and 3 in **Mikhmoret Map**. Many of them —mainly small, un-walled sites, survived the Arab conquest.

Site no. 1 in the **Hadera Map** are *mawasi* fields, extending along the sea shore to the south of Caesarea, upto some 800 m to the north of Naḥal Hadera. These fields of Caesarea were irrigated by water drawn from the near to surface aquifer, by a bucket attached to a beam. Many sites were traced only by dispersed stones, sherds, glass fragments and sometimes also mosaic *tesserae* —all wall traces were obliterated, seemingly by masonry stone looters. Roman and Byzantine sites of some significance, other than those indicated above, are recognized only by the area (not always specified), over which such remains were dispersed. These are site no. 98 (Kh. Qeisuma), of 1 dunam; sites nos. 16, 45 and 95 (Zelefa), of 2 d. each; sites nos. 78, 89, 96 and 99, of 2.5 d. (=50 x 50 m) each; sites no. 94, of 4 d.; 63, of 5 d.; 93 of 7 d.; 64 of 10 d. and 67 (Kh. el Beika), of 20 d. These might have been farms, or small villages. The others were of smaller size. Nine sites are associated with burials. Site no. 88 turned out to be a glass factory of several kilns, and seemingly such was also site no. 78, not excavated yet. Site 66 is an Othoman khan that might have been built on top of an earlier, Byzantine way station with a mosaic floor.

As for **Mikhmoret Map**, site no. 8 (Tel 'Afar) —a sort of *villa maritima* dated to the Byzantine period, will be described below. All others, not referred to above, are small sites.

—**Ma'anit Map (54)**³¹ is located to the southeast of Binyamina Map (48). Out of the 69 map sites, 65 are dated to the Byzantine period. Only 21 of them are settlement sites; their sizes are not given. It seems that the larger among them were locate in the confines of Baqa al-Gharbiyah, Barqai, Metzger, Tel Narbatha / Kh. Bidus to the south of kibbutz Ma'anit, and in Tel Asur.

—**Netanya (56), Kfar Yonah (57)**³² and **Tul Karem (58)**³³ **Maps**, all first surveyed by Eli Yalai, share a common Introduction.³⁴ Of these, only **Tul Karem**

31. Map of Ma'anit (54): Yehuda NE'EMAN, *Ma'anit Map (54)*, Jerusalem, Israel Antiquities Authority, 1990 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.944477513,32.4387868425;mapname=54>.

32. Map of Kfar Yonah (57): Eli YANNAI, *Kfar Yonah Map (57)*, Jerusalem, Israel Antiquities Authority, 2017 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:35.0508131665,32.4389613325;mapname=57>.

33. Map of Tulkarm (58): Eli YANNAI, *Tulkarm Map (58)*, Jerusalem, Israel Antiquities Authority, 2017 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.9447357065,32.3486122305;mapname=58>.

34. I am indebted to Dr. Ofer Sion for providing me the text and coordinates files of these maps, as well as of Survey Map 59, all not published yet.

30. Much of the Mikhmoret map area is sea. This and Hadera Map, located to its east, were surveyed by Neeman in the years 1973-78, who uncovered just 50 sites; their field survey was complemented by Sender and Oren in 1998, who traced 100 more sites, mainly in former orange orchards that were uprooted. Map of Mikhmoret (52): Yehuda NE'EMAN, Shlomo SENDER and Eldad OREN, *Mikhmoret Map (52)*, Jerusalem, Israel Antiquities Authority, 2000 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.80852508545,31.298049926757;mapname=52>. Map of Hadera (53): Yehuda NE'EMAN, Shlomo SENDER and Eldad OREN, *Hadera Map (53)*, Jerusalem, Israel Antiquities Authority, 2000 <http://www.antiquities.org.il/survey/newmap_en.asp#zoom=8.0000;xy:34.80852508545,31.298049926755;mapname=53>.

Map was actually surveyed afoot; the other two present data compiled by him from earlier publications by numerous earlier researchers that had recorder finds that already disappeared due to intensive agricultural and infrastructure development of this strip of the Sharon plain. In the Hellenistic period settlement continued in 5 earlier sites: Tel Haniel, Tel Shevah., Kibbutz Ma'abarot plantations, H. Yama and Tell Ifshar / Tel Haled (40 d.). The maritime activity in Mikhmoret anchorage increased. New settlements came into being in Bir al-'Abd (200 d.), HaMa'apil east and Umm Haled / Netanya (10 d.), that became an important settlement near the outlet of Naḥal Alexander from then and on.

The number of settlement increased in the Roman and Byzantine periods, due to the foundation of Caesarea and the ensuing construction of well paved Roman roads connecting it to Apollonia and Jaffa along the sea shore, and Antipatris on the SE. Earlier swamps were drained; the Sharon Wood became more and more deforested and the tilled lands extended farther afield. Such was actually the settlement process in all other Survey Maps, supplying the necessary provisions for Caesarea — the capital. Due to latter stone looting, this pick of settlement is reflected more in the survival of Roman and Byzantine cemeteries, rather than in ruined settlements. These were encountered mainly in HaMa'apil, 'En HaHoresh, Mghar al-Sharf, Aviḥail and Umm Haled / Netanya. Noteworthy sites are H. Beth Lid — Nordiya, Kh. al Adham (Kfar Yonah), Pardesiya / Kh. Umm Phalus, Kh. Umm Şur, Rijal al-Hareb, Majhad Sheikha, H. Yama (20 d.) and more. Later, under Muslim rule, a decline in the number of settlements had started. The major sites in the eastern part of this strip were Kh. Jalameh, Bir al-'Abd, Qaqun, Tel Shevah. (10 d.) and Kh. Sibb; Tell Ifshar / Tel Haled in the center, and Umm Haled / Netanya in the west. Milestones were recorded in 3 sites (nos. 3 — Bir al-'Abd, 15 and 35). A church was excavated in site no. 51 — Pardesiya, and burials were recorded in 3 sites.

— **Even Yehuda Map (59)**³⁵ was surveyed by Gofna and Ayalon in 1977-79 and by Marom ten years later (1999-2004). Out of the 42 sites dated to the Roman period, only 9 (and perhaps 5 more, recognized only by dispersion of stones and sherds), can be considered as settled sites, generally of small dimensions. Site no. 166 (Kh. Jius, 1.5 d.), was a farm founded in the 3rd c. Out of the 67 sites dated to the Byzantine period, 11 were identified as settlements (perhaps 7 more), including the farm mentioned above. Site no. 162 — Kh. el Balaqiye, extended over some 25 d.; no. 10 - over 15-20 donams; no. 179 - 10 d.; no. 6 was 5 d. in size, no. 22

TABLE 2: *Number of settled sites of the Byzantine period* (Table: Joseph Patrich).

Map Name	Number of Settled sites*
Dor (30)	25
Daliya (31)	20
Binyamina (48)	27
Regavim (49)	40?
Mikhmoret (52)	5
Hadera (53)	19
Ma'anit (54)	21
Netanya (56)	3
Kfar Yonah (57)	10
Tul Karem (58)	4
Even Yehuda (59)	11
Total	185

* Ranging in size from several dozens to just 3d and less, and dated to the Roman and Byzantine periods.

— just 2 d.. Others were smaller and no dimensions are provided for many of them (such as 127 — Tel Yizhak 1; 147 — Kh. Zureiqa). In three sites (nos. 27?, 34, 143?), burials were found. A church was excavated in sine no. 14 — Baḥan. As for the Early Arab period, only 3 sites were identified as settlements.

The listed settled sites much differ in their dimensions (which in many cases are not provided). Only few extended over several dozens of d.. More were much smaller, representing perhaps farmsteads or just small farmhouses. Military installations of the Roman and Byzantine periods are almost none. The actual area occupied by the Survey Maps is about 800sq.km, with a total of 185 settled sites. Namely - ca. 23 settled sites of different dimensions per 100sq.km. How many of them were full-fledged villages is hard to tell in the present state of knowledge. As was indicated above, Holum estimated this number to be 100-120. In *TIR* map only 54 villages, 4 forts and 9 farmsteads are marked within these confines. A better evaluation of the settlement pattern should include a thorough examination of aerial photographs of past years, taken before the intensive works of development that had changed the landscape considerably. In some cases, getting back to the field would be indispensable. Such a task is beyond the scope of the present study.

But another big lacuna in the archaeological data presented here concerns the salvage excavations. This information, not all of which already published, is stored in another IAA server, not accessible to the public. The compilation and analysis of all this data deserves a separate study. Faust and Safrai³⁶ refrained from relying on

35. Map of Even Yehuda (59): Etan AYALON, Roy MEROM and Noy SHEMESH, *Even Yehuda Map (59)*, Jerusalem, Israel Antiquities Authority, 2016 <<http://www.antiquities.org.il/#MapSurvey/2160>> (in Hebrew).

36. Avraham FAUST and Ze'ev SAFRAI, *The Settlement History of Ancient Israel: A Quantitative Analysis*, Ramat Gan, Universitat Bar-Ilan, Merkaz Ingeborg Renert le-limude Yerushalayim, 2015.

survey results in their book on the rural settlement in Israel. They rather preferred to rely on salvage and initiated excavations. But ignoring entirely information derived from the Survey Maps seems to me going too far.

At the absence of more detailed settlement hierarchy in the Survey Maps, all that could be presented in Table 1 and in the accompanying maps (Figs. 3 and 4), are just the periods, not the size, or type, of each site. But one should note that the periods' definition (presented in different colors on the maps), is not the same in all Maps; some surveyors had differentiated between Roman and Byzantine sites; in other maps the more general term 'Roman-Byzantine' is applied; and in some cases the Roman period is divided into Early Roman and Late Roman.

The total number of sites per period presented in Table 1 is just one aspect of the settlement pattern emerging from a Survey Map; somewhat misleading when listing different sections of the same aqueduct as different sites. Likewise sections of Roman roads, bridges, milestones, quarries, tombs, and all sorts of non-inhabited installations in the countryside.³⁷

4. Agricultural (and other) installations

The survey below presents a summary of the distribution of wine and oil presses and of farmsteads in the Survey Maps in the hinterland of Caesarea.³⁸

In **Dor Map**, more than 20 winepresses and more than 7 oil-presses were recorded, agricultural terraces (no. 8) and unspecified installations (nos. 30; 126 —extending over 18d. and including an oil press).

In **Daliya Map** oil or wine presses were recorded in 18 sites: 16, 19, 24, 25, 28, 30?, 43?, 44, 46, 47, 52, 59, 63, 75, 77, 79, 91, 151. Oil and wine presses were excavated in Ramat HaNadiv (H. 'Aqav), Jalameh, Naḥal Ḥaggit (two oil presses; see below), and Shuni. The total number of oil presses recorded in the map is 6. The other were wine presses.

In **Binyamina Map** oil-presses were recorded in 9 sites: 2, 9, 14, 28, 45, 90, 99, 107, 114. Site no. 22 — Khirbet Zeituna, brings to mind olive oil orchards, but no oil press was recorded there. Wine presses were recorded in 3 sites (nos. 28, 41 — Mansur al-'Aqeb, a farmstead, and 48). More oil and winepresses were later excavated in Ramat HaNadiv farmsteads (see below). No. 120 is identified as a farmhouse.

37. Years ago, while I conducted the *Survey of Mar Saba Map* (no. 315; 1995) in the Judean Desert, in which 134 sites were recorded, I had commented about this point in a footnote appended to the Table of Sites according to the Periods.

38. For a somewhat similar summary pertaining to the hinterland of Apollonia see: Israel ROLL and Etan AYALON. *Apollonia and Southern Sharon: Model of a Coastal City and its Hinterland*, Tel Aviv, Israel Exploration Society, 1989.

In **Ḥadera Map** the remains of an oil press were recorded in site 43 alone, and a single wine press was excavated in site no. 70, with a 7.7×7.5 treading floor and two storage basins.

In **Regavim Map** a more detailed summary is provided: 30 wine presses and 15 oil presses were recorded. A detailed discussion concerning typology, geographical distribution and more are also given there.

In **Ma'anit Map** oil presses were recorded only in relation to 3 sites; 9 wine presses were also recorded, only 3 of them with relation to settlements.

In **Netanya Map** a single oil-press was recorded in a farm (Gan Ḥefer —site no. 28).

In **Kfar Yonah Map** at least 6 winepresses and 3 oil presses were recorded, as well as other agricultural installations, and one glass workshop (site no. 52 — Tel Zoran). In **Tul Karem Map** 2 oil presses and 12 winepresses were recorded, many of them around Kh. al-Marshiya and Kh. Sh. Muḥd (sites nos. 18-22,24-25).

In **Even Yehuda Map** Roman agricultural installations, either winepresses, or oil-presses, were recorded in just 4 sites (nos. 10, 22, 86, 162). Byzantine Oil and winepresses were recorded in 5 sites (nos. 6 —several of each, 127, 162?, 166, 179); more than 4 oil-presses and 3 winepresses. One site (no. 7), was a pottery workshop and 3 sites (nos. 166, 167? and 169?), were glass factories.

Interestingly, on the average, the amount of winepresses recorded (see Table 3), is almost twice the amount of oil-presses. In Binyamina map, that includes Caesarea, the picture is entirely reversed, with 10 oil-presses as against just 2 winepresses. In Even

TABLE 3: *Numbers of oil and winepresses in the Survey Maps** (Table Joseph Patrich)

Map Name	No. of o/p	No. of w/p
Dor (30)	7	20
Daliya (31)	6	12
Binyamina (48)	10	2
Regavim (49)	15	30
Mikhmoret (52)	—	—
Ḥadera (53)	1	1
Ma'anit (54)	3	9
Netanya (56)	1	-
Kfar Yonah (57)	3	6
Tul Karem (58)	2	12
Even Yehuda (59)	4	3
Total	52	95

* At some sites the occurrence of an installation is indicated in the plural, without specifying a number. Hence, the numbers presented here are minimal.

Yehuda map the numbers are almost equal: 4 oil-presses and 3 winepresses. The almost absence of such installations in Hadera and Netanya maps may result from modern over-cultivation and construction works that obliterated these remains, rather than from natural geological and geographical features.³⁹ The total of 52 oil presses and 95 wine presses seems to be small relative to the 100 installations of each type mentioned by Dar for Mt. Carmel (see below).

5. Some particular cases

The studies of Shimon Dar on the rural settlements in Western Samaria (of sites such as Qarawat Bani Hasan and Umm Reiḥan,⁴⁰ and in the hilly Southern Carmel,⁴¹ some sites of which are within the confines of the countryside of Caesarea at our concern, are at a sheer variance relative to the Survey Maps discussed above. It was a thorough architectural and topographical survey, complemented by excavations in some cases. The extension of the arable land associated with each site was marked and analyzed as well.⁴²

39. Most recent studies on wine and oil presses are Rafael FRANKEL, *Wine and Oil Production in Antiquity in Israel and other Mediterranean countries*, Sheffield, Sheffield Academic Press, 1999; and Yiṣḥaq MAGEN, *Judea and Samaria: Researches and Discoveries*, Jerusalem, Staff Officer of Archaeology Civil Administration of Judea and Samaria, 2008 (on oil presses in Southern Samaria and Southern Judaea), who in p. 294-95 addresses installations found in the Sharon. Magen (Yiṣḥaq MAGEN, *Judea and Samaria: Researches and Discoveries*, 2008, p. 258-59, 309-329) claims that two new types of pressing technology were introduced in the Umayyad period: a lever-screw-and-cylindrical weight and pier-shaped weights and a screw, and that this period, until the 9th c., had witnessed a pick in oil industry in the areas he examined. These conclusions stand in contrast with previous studies, according to which this pick had occurred earlier, in the Byzantine period. Magen also maintains that this oil industry was an initiative of the Muslim regime and that the olive oil was exported eastward, to the Umayyad territories. For a critical review on Magen's claims, see: Itamar TAXEL, «The Olive Oil Economy of Byzantine and Early Arab Palestine: Some Critical Notes», *Liber Annuus* (Turnhout), vol. 63 (2013), p. 361-394. More on the oil industry in Late Roman Palestine see also Ze'ev SAFRAI, *The Economy of Roman Palestine*, London, Routledge, 1994, p. 118-127, on the grape and on the wine industry — Ze'ev SAFRAI, *The Economy of Roman Palestine*, 1994, p. 126-136.

40. Shimon DAR, *The settlement pattern of Western Samaria in the periods of the Second Temple, Mishna, the Talmud and the Byzantine period*, Tel Aviv, Publications of the Society for Protection of Nature, 1982 (Hebrew).

41. Shimon DAR, *Rural Settlements on Mount Carmel in Antiquity*, Jerusalem, Ha-Hevrah le-Haḳirat Erets-Yiśra'el ve-'Atiḳotehah, 2012, p. 189-190; Shimon DAR, *Rural settlements on Mount Carmel in Antiquity*, Oxford, Archaeopress Archaeology, 2014.

42. Qarawat Bani Hasan in Western Samaria is the best example for recording and analyzing a rural village and its fields carried out by Dar. Located ca. 30 km to the east of Rosh ha'Ain, on a hill 300-400 m high a.s.l., it is outside the *territorium* of Caesarea. Yet the methodology applied and the ensuing conclusions are relevant to our study.

Umm Reiḥan. The village, that extended over 36-40 d., is built on a rocky terrain, some 24km to the east of Caesarea. A similar methodology was applied by Dar, Tepper and Safrai⁴³ in the study of this village of Western Samaria, located within the confines of Caesarea. The site was abandoned in the 3rd c. CE; only some parts of it were re-occupied in the Byzantine period. It comprised ca. 100 courtyard houses, 80 of which were surveyed. The layout of the streets is well recognized. Each house comprised 3-5 rooms and a courtyard on the ground level; many of them had a second story, and some — a cellar. The number of rooms per house was 6-10, giving 640 rooms altogether. An estimation of 4-5 people per room (a kernel family), will result in a population of 2500-2700 inhabitants, dwelling in the 80 surveyed houses, and a total of 3000-3500 people for the entire village of 100 houses, with a density of 83-90 people per a dwelling dunam.

As for the arable lands, 300 d. served as olive orchards, 400-600 d. were vineyards — 4-5 d. per each of the ca. 120 recorded field-towers. 8-9 oil presses were documented in the village; many more were dispersed in the agricultural lands. Altogether, more than a dozen wine presses were documented. Excavations were held in 3 wine presses and in 15 towers. Six farms were also recorded in the adjacent area. Soundings were carried out in two of them; four other (site no. 61, Moshav Reiḥan, Qasr a-Ledja and Zaḳzūq), were just surveyed.

A SIMILAR METHODOLOGY WAS APPLIED BY DAR IN HIS STUDY OF SOME II SITES IN **Hilly Carmel**,⁴⁴ 1-1.5 km distant from each other. They were erected on the moderate hilly plateau, or to its east, on terraces before the sharp eastern drop. A strip of land thoroughly cleared of stones surrounded each settlement. Of the 11 sites treated there, only three are included in the confines of Caesarea. These are Kh. Mansura — a rural settlement occupying some 20 d. and two farmsteads: Kh. Umm ed-Daraj — a large farmstead, and Kh. es-Sulemanije — A farmstead well protected all around (12.3 d; 90 × 137 sqm). The farmhouse in the center (32 × 53 sqm = 1.7 d in dimensions), was surrounded by workshops and other appended structures. The largest settlement included in northern most confines of Caesarea was Ḥorvat Sumaqa, which Dar had extensively excavated between 1983-1995.

Ḥorvat Sumaqa,⁴⁵ a Jewish village that reached its apogee in the 4th-6th c. It was built on a moderate terraced spur descending south from a top elevation of 340 m a.s.l., encompassing a 300 × 400 sqm area. The settle-

43. Shimon DAR, Yigal TEPPER and Ze'ev SAFRAI, *Umm Reiḥan. A village of the Mishnah period*, Tel Aviv, ha-Ḳibuts ha-me'uḥad, ha-Hevrah la-haganat ha-teva', 1986 (Hebrew).

44. Shimon DAR, *Rural Settlements on Mount Carmel in Antiquity*, 2012, p. 189-190.

45. Shimon DAR, *Sumaqa. A Jewish Village on the Carmel*, Jerusalem, Israel Exploration Society, 1998.

ment itself occupied ca. 30 d. and housed ca. 800 inhabitants (adopting a coefficient of 25-30 people per dunam of dwellings);⁴⁶ it occupied ca. 60 d. with the surrounding workshops and agricultural installations. The excavated structures included a synagogue, two dwelling complexes out of ca. 20, a water reservoir, an oil press, 3 wine presses out of 5, 6 workshops with treading floors out of 13, several burial caves out of more than 20 (one of which depicting two *menorahs* on its façade).

Importing of soil cleared of stones was encountered at the site. Its arable lands, with dammed rivulets and 4 large water reservoirs, extended over 5.340 d., 60 % of which (ca. 3.000 d.) were terraced.⁴⁷ It could sustain 937 people (each having a plot of 3.2 d.). A small farmhouse (15 × 20 m), is 1.350 m distant from the village. A field tower and a large cave with pens for herds were surveyed as well. It is estimated that a terraced area extending over some 750-1000 d. was covered with vines, and that the annual wine yield of each wine press was some 150.000-200.000 liters. Much of this yield was exported to the adjacent cities. Millstones were also found in the village. The un-terraced pasture land, extending over ca. 2.000 d., could sustain some 700 sheep and goats, as well as several dozens of cattle.

Agricultural terracing: 25 %-30 % of the Hilly Carmel is terraced.⁴⁸ The terraced plots served for planting vine and olive orchards and for growing corn and lentils, in the relative amounts of 1/3 of each sort. In other plots fruit bearing trees and special plants were grown.

Agricultural installations, yields and human subsistence: Ca. 100 wine presses and a similar number of oil presses were recorded on the hilly Carmel. According to Dar, the annual oil consumption per capita is 20 kg. Wine provided for 20 % of the daily required calories. An adult would drink 150-182 liters of non-diluted wine per year; women —half of this amount.

Farms and their agricultural yield: There were numerous farms in the hinterland of Caesarea in the Roman and Byzantine periods, as well as in the Persian and the Hellenistic ones. In the Samaritan revolt of 529/30, whole Christian estates were set on fire.⁴⁹

46. See: Magen BROSHI, «The Population of Western Palestine in the Roman-Byzantine Period», *Bulletin of the American Schools of Oriental Research* (Boston), vol. 236 (Autumn, 1979), p. 1-10.

47. Shimon DAR, *Sumaqa. A Jewish Village on the Carmel*, 1998, p. 221-248 (The Agricultural Plot of Sumaqa).

48. Shimon DAR, *Rural Settlements on Mount Carmel in Antiquity*, 2012, p. 189-190, Fig. 198. In Jerusalem hills the rate is 56 %. Terracing enables to increase by 25 % the amount of planted trees in terraced plots relative to un-terraced ones. It also prevents erosion, increases the amount of flowing water soaked, and enables planting and sawing in steep slopes, impossible without terracing.

49. Especially in the region of Neapolis located to the SE of Caesarea, deep in the land of the Samaritans. The number of

The most impressive farmsteads are those excavated by Hirschfeld in Ramat HaNadiv on the Carmel ridge —Manzur al-'Aqeb / Ḥorvat Aqav and Ḥorvat 'Eleq, and that of Naḥal Ḥaggit.⁵⁰

Manzur al-'Aqeb / Ḥorvat Aqav,⁵¹ was a vast Early Roman farmstead and a Byzantine *villa rustica*. It was excavated by Hirschfeld in the years 1984-1987. The Early Roman farmstead was larger in area than the Byzantine villa. The total area extended over 2.3 d., with maximal dimensions of 58.50 × 49.40 m. It was surrounded by a wall with two gates —on the east and on the north. A corridor led from the eastern gate to the main courtyard with a water cistern underneath. To its south were warehouses, cow and sheep sheds, and to its north — a massive structure —seemingly an internal tower (9.5 × 8 m). The dwelling quarters were on the west, holding a bathtub and an adjacent *miqveh* (a Jewish immersion pool). An oil press and two wine presses were also uncovered; one of them outside the walls. The site was deserted in the First or Second Jewish Revolt.

The Byzantine villa, almost square in dimensions (22 × 24 m) and of two stories, was built above the Early Roman farmstead in the 4th, or early 5th c. It was occupied until the Arab conquest. Walled as well, it had gates on the west and on the south. In the lower floor, around the inner courtyard (15.60 × 8.50 m), were a long warehouse, a wing of stables with wooden troughs, and a wine cellar. Red soil with no stones was transferred to the place to serve a garden. A wine press with a circular treading floor was located outside. The place was abandoned due to the Muslim conquest (634-640/1).

Ramat HaNadiv Early Roman farm at Ḥorvat 'Eleq,⁵² is located ca. 8km to the north of Caesarea, on top of a hill (100 m a.s.l.). According to Hirschfeld, this was an elaborate, square, fortified farm with towers at its four corners, of the *tetrapyrgion* type with a total area of more than 5 d. that might have belonged to the Herodian nobility of Judaea —a palatial estate. It superseded an earlier Hellenistic settlement and it was abandoned during the First Jewish Revolt (66-70 CE). The extra-mural components of this agricultural estate included a swimming pool fed by the adjacent spring of 'En Zur by means of an aqueduct, a bathhouse with an underfloor heating system located nearby, an irrigated garden, a *columbarium* and an olive oil

Christian estates of this kind must have been much larger in the rural area of Caesarea. (Cyril of Scythopolis, *Vita Sabae* 70 [KYRILLOS VON SKYTHOPOLIS, *Texte und Untersuchungen*, ed. by Eduard Schwartz, Leipzig, J. C. Hinrichs Verlag, 1939, p. 171-172]).

50. In addition to the farms near Umm Reiḥan mentioned above. Another farm was explored by Dar on the Hilly Carmel - Ḥorvat Suleimaniyah (near Talimon Cave).

51. Yizhar HIRSCHFELD, *Ramat HaNadiv Excavations: Final Report of the 1984-1998 Seasons*, Jerusalem, Israel Exploration Society, 2000, p. 13-87.

52. Yizhar HIRSCHFELD, *Ramat HaNadiv Excavations: Final Report of the 1984-1998 Seasons*, 2000, p. 235-370.

press. The *tetrapyrgion* had a gate in the north, and a second—in the south—leading to the spring.

The inner area was divided into four functional parts separated from each other by straight streets: The internal main tower (13.5 × 11.5 m), ca. 20 m high, on the NW, reinforced by an outer wall 3m thick; an elaborate villa of some 50 rooms in two stories, on the south, near the gate; living quarters for the staff and servants working at the site, comprising of ca. 30 rooms of various dimensions and a small courtyard with cooking installations—in the center. Some halls, near the courtyard, were identified as dining rooms; others—as stables. Other structures along the northern and eastern enclosing walls could serve for storage. A bathtub in one of the rooms of the main tower indicates that its upper story might have also served for dwelling. A spiral wooden staircase supported by a central pier connected between the floors.

The archaeological-architectural report was complemented by a quantitative study, speculative to a certain degree, pertaining to the geophysical conditions, subsistence and potential agricultural yield in dry farming at the site.⁵³ The arable lands cultivated by the inhabitants of the farm are estimated to be 15.000 d.; only half of which was tilled each year, the other was laid fallow. The main commodities were cereals, olives and vines and various fruit trees, such as figs, pomegranate, almonds and some peaches, apples and pears.

Since five members of a nuclear family could till 200-300 d. in pre-modern times, ca. 25-35 families could cultivate ca. 7.000 d. The 4.8 d. walled area of the site could accommodate more than 80 people, i.e.—16 nuclear families, if a co-efficient of 20-25 people per residential dunam is applied. The other workers (estimated to be 350-500, emerging from 70-90 families), would have lived outside. In addition to place of dwelling and storage, the site had also served as the administrative and military headquarters of the estate.

As for the livestock, it is estimated that each family had a pair of oxen and probably a donkey (a stable was uncovered at the site); some might have camels and horses. Herds of sheep and goats pastured outside the walls. As for the agricultural yield of crops, the following calculations are given:

—Wheat: Taking a yield of 80 kg. per dunam as a norm. 7.000d. will provide 560 tons of wheat per year. The yield for barely is higher. Olive trees could be grown on the hills, or interspersed with wheat. Similar calculations can be applied for lentils, with a coefficient of 115.2 kg yield per dunam and for beans - 147.3 kg per dunam.

53. Baruch ROSEN, «Subsistence Possibilities of the Ramat HaNadiv Sites», in Yizhar HIRSCHFELD, *Ramat HaNadiv Excavations: Final Report of the 1984-1998 Seasons*, Jerusalem, Israel Exploration Society, 2000, p. 637-649.

—Wine and oil: If the total available lands for arboriculture (olives and vines) was 1000 d. for each, coefficients of 900 kg of grapes per dunam and 100 kg of grapes providing 60 liters of wine, will result in 560.000 liters of wine per year. Coefficients of 200 kg olives per dunam, and 15-18 kg of oil per 100 kg of olives, will result in 30-35 kg of oil per dunam and 30-35 tons of oil per year for 1000 dunams of olive orchards. Such yields suggest export on a large scale (the annual consumption of a person in pre-modern times was ca. 20 kg). Another venue of calculations can be derived from the dimension of the treading floors of wine and oil presses. These dimensions permit to get quantitative evaluations of their wine and oil yield.⁵⁴

Such yields can be translated into calories:⁵⁵ Wheat provides 3300 calories per kg; lentils - 3400 calories per kg; beans - 3480 calories per kg.⁵⁶ Since the daily requirements of calories of a 10 years old boy is 2200 and for a 22 years old lad is 2800, the total amount of population that could have been nourished by the land yields given above can be easily calculated.⁵⁷

As for the livestock: a sheep unit is the pasture area needed for a single sheep to survive. This number enables to evaluate the size of a herd that could find pasture in an area of a given size, and thence estimate the annual meat and milk yield of a herd, and convert the number into calories. The distribution of sheep and goats pans and the extension of the non-arable lands enable to mark pasture lands and evaluate their nutrition potential. Bones uncovered in an excavated site provide information about the dietary habits of the population and the labor and burden animals employed. In Ramat HaNadiv and Ḥorvat 'Ada farmsteads, sheep, goats and beef were raised for milk and meat, and doves for meat and fertilizing refuse (*guano*).

54. Such approaches were applied by Dar for Qarawat Bani Hasan and Ben David for the oil yield in southern Golan. See also: Chaim BEN DAVID «Oil Presses and Oil Production in the Golan Heights during the Mishnah and Talmud Periods», *Atiqot* (Jerusalem), vol. 34 (1998), p. 1-61.

55. Charlotte CHATFIELD, *Food Composition Tables for International Use*, Rome, Food and Agriculture Organization, 1953, p. 9-23, Nutritional Studies no. 3; Elizabeth S. WING and Antoinette B. BROWN, *Paleonutrition: Method and Theory in Prehistoric Foodways*, Orlando, Academic Press, 1979, p. 23-5.

56. Wallace R. AYKROYD and Joyce DOUGHTY, *Wheat in Human Nutrition*, Rome, Food and Agriculture Organization, 1970, p. 30; B. K. WATT and A. L. MERRILL, *Composition of Foods*, Washington DC, Department of Agriculture, 1963, p. 68.

57. Similar calculations were carried out by Dahari and Sion for Rehovot in-the-Negev. They examined the theoretical yield of cereals, legumes olives, wine, almonds, apricot, pomegranate, fig-trees and cherubs per dunam and their caloric values. Mapping the entire fields enabled them to calculate their entire yield, caloric values and the population size that could be nourished on such yields. See: Uzi DAHARI and Ofer SION, «Ruḥeibeh - Rehovot in-the-Negev as a model of a desert town», *Qadmoniot* (Jerusalem), vol. 154 (2017), p. 66-77 (Hebrew).

This way the potential yield of corn, oil, wine, meat and milk produce of a particular farm and village can be evaluated, and thereafter, theoretically—that of the entire *territorium* of a particular city—Caesarea in this case.

Naḥal Haggit Farmstead:⁵⁸ The Middle Roman main stage of this manor much resembles in its general layout Ḥ. 'Eleq, but it was less fortified; it had no wall towers; it was not of the *tetrapyrgion* type. 5.5d. out of its ca. 9.5d. area was excavated. The Early Roman farm, rectangular in shape (17 × 23m in dimensions), dated to the 1st c. BCE–1st c. CE and abandoned as a result of the 2nd Jewish Revolt, was much obliterated by the Middle Roman, main phase, dated to the 3rd c. CE. Ritual baths (*miqva'oth*), uncovered there imply that it was either Jewish, or Samaritan in the first stage. The site was deserted as a result of the Second Jewish Revolt (132–135 CE) and remained so until the early 3rd c., when according to Seligman it passed to the possession of a Caesarean veteran. Finally it was abandoned at the end of that or early 4th c.

It is located in Daliya Survey Map, on a moderate hill (159.3 m a.s.l.) of Manasseh Heights, between Naḥal Tut and Naḥal Haggit. The average annual precipitation rate is 645mm and there are 5 adjacent springs. The walled farmstead, ca. 89 x 89m in area, comprised several courtyard-type houses of similar size, and storerooms along the encompassing walls. It was suggested that the houses were gradually added, as more and more members of the family who owned the farm got married. Millstones, grinding stones and agricultural tools attest that this was a well-planned rural farm settlement. Two oil presses and a large water cistern are located in the center of the site. The predominance of Caesarea city coins indicates close economic and cultural connections with the city.

The farmstead, 9.5d. in area, could house an estimated population of 190–238 people, that could cultivate 7.600–16.000d. of arable land, permitting the cultivation of cereals, pulses, arboriculture and more. Much more land was available around (28.260–50.240 d. according to Seligman). The pasture lands enabled sheep, goats, cattle, swine, donkeys and horses to graze there.

5.1. Palatial manors and mansions (extra-mural and in the countryside)

Ḥorvat 'Eleq (following Hirschfeld's interpretation), was not the only complex of palatial essence in the countryside of Caesarea. The structure on top of Tel

'Afar on the coastal plain (to the west of Giv'at Olga, 6 km to the south of Caesarea) was a wealthy mansion overlooking the sea, like a *villa maritima*. Nearby stood a massive rectangular structure with thick walls, square towers at its corners, buttresses on each side and two vaulted openings. It might have served as a granary. Numerous roof tiles, marble fragments and many tesserae were also found in the entire excavated area. Porath⁵⁹ had suggested that the complex was an extra-mural governor's palace; Peilstöcker⁶⁰ opined that it might have served as a monastery, but at the absence of a church, this seems to me a far-fetched proposal.

WEALTHY DWELLINGS (*villae suburbanae*) were also uncovered outside the city walls of Caesarea. The most impressive is the villa located to the northeast of the city, at a distance of a few hundred meters from the city wall. Its central courtyard was decorated with the 'Birds Mosaic'. The villa was situated atop a hill overlooking the sea and the city.⁶¹

Monasteries⁶² were perhaps located on top of Tel Tanninim⁶³ and Tel Ḥuwira / Tadvira, on the sea shore. From the literary sources it is known that a nunnery and a monastery existed in Aphthoria, 12 miles to the south or SE of Caesarea. The proposed identifications include Baḥan, Bir al-'Abd and Umm al-Ḥaled / Netanya, but there is no certainty.⁶⁴ A Laura might have existed in Naḥal Galim, descending from Mt. Carmel. It is also known that in the mid 6th c. a monastery existed outside one of the city gates. But altogether, there is only meager evidence concerning monasticism in the region of Caesarea, both literary and archaeologically.⁶⁵

59. Yosef PORATH, *Excavations and Surveys in Israel*, vol. 7-8, Jerusalem, Israel Department of Antiquities and Museums, 1988-89, p. 1-3, fig. 1-2.

60. Martin PEILSTÖCKER, «Tel 'Afar: a Byzantine site south of Caesarea», *'Atiqot* (Jerusalem), vol. 61, (2009), p. 95-118.

61. Mary SPIRO, «Some Byzantine mosaics from Caesarea», in Robert L. VANN (ed.), *Caesarea Papers: Straton's Tower, Herod's Harbour, and Roman and Byzantine Caesarea*, Michigan, The University of Michigan, 1992, p. 245-60.

62. Joseph PATRICH, «Monasticism in Caesarea and its Region», in Joseph PATRICH, Orit PELEG-BARKAT and Erez BEN-YOSEF (eds.), *Arise, Walk through the Land. Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of his Demise*, Jerusalem, The Israel Exploration Society, 2016, p. 199-214.

63. Robert R. STIEGLITZ, *Tel Tanninim. Excavations at Krokodilon Polis 1996-1999*, Boston University, 2006.

64. For references see Joseph PATRICH, «Monasticism in Caesarea and its Region», p. 199-244.

65. Joseph PATRICH, «Monasticism in Caesarea and its Region», p. 199-244; Ayelet Dayan, in her Ph.D. dissertation, derived from still unpublished materials in the IAA archive files, had marked 10 sites in the area of Naḥal Ḥadera and Baḥan, where a monastery might have existed. These are: Naḥal Ḥadera (west), Ḥadera (no. 3), Naḥal Ḥadera (east), Ḥ. Burin and Baqa al-Gharbiyah (no. 4), Ḥ. Phirasin (no. 5), Kh. al-Katsir (no. 6), Ḥ. Masin

58. Jon SELIGMAN *et al.*, *Naḥal Haggit: A Roman and Mamluk Farmstead in the Southern Carmel*, Jerusalem, Israel Antiquities Authority, 2010.

6. Summary

The city and its countryside were a single administrative and economical entity with respect to provision of food supply, taxation and administration. A recent study by Holum,⁶⁶ as well as earlier studies, had clearly elucidated this point. Any attempt to quantify these aspects must start with tracing the territorial boundaries of a city. As was indicated above, there are disagreements among scholars about this point. Holum's map was adopted here for the countryside of Caesarea. Theoretically, an analysis of the soils included therein,⁶⁷ may permit to evaluate the potential agricultural yield of a particular countryside. This is not a simple task, but the available technology makes it possible. For this hand a digital application that will present all geographical features and archaeological data that pertain to a particular region—a city and its countryside (*territorium*), can be developed, enabling to present each city in the context of its archaeological and geographical countryside. Such an application can show, on screen, all relevant archaeological data, to evaluate the agricultural yield and population size and to present these results in tables, charts and maps in GIS (Geographical Information System),⁶⁸ or similar technology. Such technology permits to present geographical information as well as archaeological and historical data as superimposed cartographical layers. The objective of such a project is to present a synthesis between the archaeological finds and the soil and geo-physical features of the said *territorium*, in order to evaluate the land use, and provide the potential agricultural yield of the region. The agricultural installations, superimposed on the soils layer will enable to determine the land use and analyze the potential agricultural yield of each zone within this territory, and of the territory in its entirety; the agricultural installations, such as terraces and oil and wine presses, will permit to identify

(no. 7) (in the area of Naḥal Ḥadera); Deir al Ghusun (no. 8), Baḥ an (no. 9), H. Sib (no. 10) (in the area of Baḥan). The identification of these sites as monasteries is very dubious. See: Ayelet DAYAN, *Monasteries in the Northern Judean Shephelah and the Samaria Western Slopes During the Byzantine and the Early Arab Periods*, Ph.D. dissertation, Bar-Ilan University, 2015.

66. Kenneth G. HOLUM, «Caesarea Palaestinae: City and Countryside in Late Antiquity», in Joseph PATRICH, Orit PELEG-BARKAT and Erez BEN-YOSEF (ed.), *Arise, Walk through the Land. Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of his Demise*, Jerusalem, Israel Exploration Society, 2019, p. 1-16.

67. For soils studies see: N. GIL and Z ROSENZAFT, *Israeli Soils and potential Utilization*, Tel Aviv, Ministry of Agriculture 1955; Shlomo RAVIKOVITCH, *A Guide and Map to Israel's Soils*, Jerusalem, Magnes Press, 1970. A digital soils map does exist in the Israel Institute of Geology, but a more detailed field work might be necessary.

68. Henry CHAPMAN, *Landscape Archaeology and GIS*, Stroud, Tempus, 2006.

actual crops associated with a particular sort of soil in the arable zones. Animal fens and their relations to the topography and to non-arable zones will enable to mark grazing areas. Villages, farmsteads, terraced plots, water installations etc., will enable to trace the extension of the cultivated lands and their relations to the roads and to the city. Quarries, fish ponds, lime, pottery and glass kilns etc., will enable to identify industries and other production areas. The agricultural produce can be translated into calories, and given the amount of calories necessary for the livelihood of a human being, an estimated size of the population living in the said territory can be evaluated.⁶⁹ But it seems that the major obstacles lie in the paucity and poor quality of the archaeological information in many of the Survey Maps. Yet, the possibility is there, and a move in this direction should start, if not in the rural hinterland of Caesarea, perhaps in that of another city, town, or region.⁷⁰

69. Yechiel Karl GUGGENHEIM, *Human Nutrition: Physiology, Public Health, Pathology*, Jerusalem, Magnes Press, 1981, p. 17-19; Carolyn D. BERDANIER, *Advanced Nutrition. Micronutrients*, Boca Raton (Florida), CRC Press 2000, p. 17-28.

70. Other than the studies mentioned above, numerous studies were already published concerning the territorial inter-relations between a center and its countryside, and the potential agricultural yield of a countryside of limited extension. Such are the studies of Yuval PORTUGALI concerning the countryside of Tel Kiri and Tel Yoqne'am in Izrael Valley in the Biblical period (Yuval PORTUGALI, «'Arim, Banot, Migrashim and Haserim: The Spatial Organization of Eretz-Israel in the 12th-10th Centuries BCE according to the Bible», *Eretz Israel* [Jerusalem], vol. 17 [1984], p. 282-290), the study of Baruch ROSEN on Izbet Sarta (Baruch ROSEN, «Subsistence of Stratum II», in Israel FINKELSTEIN [ed.], *Izbet Sartab*, Oxford, Oxford University Press, 1986, p. 156-185), the study of Chaim Ben David on the production of olive oil in the Southern Golan mentioned above (Chaim BEN DAVID, «Oil Presses and Oil Production in the Golan Heights during the Mishnah and Talmud Periods», *'Atiqot* (Jerusalem), vol. 34 (1998), p. 1-61), and that of Uzi DAHARI on the gardens of the monks in the high mountains of Sinai (Uzi DAHARI, «Remote Monasteries in Southern Sinai and their Economic Base», in Yoran TSAFRIR (ed.), *Ancient Churches Revealed*, Jerusalem, Biblical Archaeology Society, 1993, p. 341-350). This list is far from being exhaustive. Also should be mentioned the French studies on the Limestone Massive and other regions in Syria (Georges TATE, *Les campagnes de la Syrie du Nord du IIe au VIIe siècle: Un exemple d'expansion démographique et économique à la fin de l'Antiquité*, vol. 1, Paris, Geuthner, 1992; J. M. DENTZER (ed.), *Hauran I: recherches archéologiques sur la Syrie du Sud à l'époque hellénistique et romaine*, Paris, Librairie Orientaliste Paul Geuthner, 1985-1986, p. 5-18; 63-136), and the work of Marlia Mango and her Oxford team, on the countryside of al-Andreïn, Syria: Marlia MANGO, «Byzantine settlement expansion in North Central Syria: the case of Androna / Andarin», in Antoine BORRUT et al. (ed.), *Le Proche-Orient de Justinien aux Abbassides: peuplement et dynamiques spatiales (Actes du colloque «Continuités de l'occupation entre les périodes byzantine et abbasside au Proche-Orient, VIIe-IXe siècles»)*, Paris, 18-20 octobre 2007), Turnhout, Brepols, 2011, p. 93-122.