

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/301640867>

How and When did Tel Akko get its Banana Shape.pdf ×

Chapter · January 2014

CITATIONS

0

READS

208

2 authors, including:



Michal Artzy

University of Haifa

33 PUBLICATIONS 279 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Univ. of Haifa Ankara Univ. Joint project [View project](#)

ΑΘΥΡΜΑΤΑ

CRITICAL ESSAYS ON THE ARCHAEOLOGY OF THE EASTERN MEDITERRANEAN IN HONOUR OF E. SUSAN SHERRATT

Edited by

**Yannis Galanakis, Toby Wilkinson
and John Bennet**

Archaeopress Archaeology

Archaeopress

Gordon House
276 Banbury Road
Oxford OX2 7ED

www.archaeopress.com

ISBN 978 1 78491 018 1
ISBN 978 1 78491 019 8 (e-Pdf)

© Archaeopress and the individual authors 2014

The editors wish to express their gratitude to the Sheffield Centre for Aegean Archaeology and Sidney Sussex College, Cambridge for generous financial support that enabled the inclusion of colour images.

All rights reserved. No part of this book may be reproduced, stored in retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of the copyright owners.

Printed in England by CMP (UK) Ltd
This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

List of Contributors	iii
Introduction	1
Yannis Galanakis, Toby Wilkinson and John Bennet	
A selected list of publications by Sue Sherratt (as of autumn 2014)	6
How and when did Tel Akko get its unusual banana shape?	11
Michal Artzy and Jamie Quartermaine	
The integration of gold resources in the Byzantine economy: an open question	23
Evanthia Baboula	
The ‘Sea Peoples’ as an emergent phenomenon	31
Alexander A. Bauer	
Pottery mobility, landscape survey and maritime activity: a view from Kythera	41
Cyprian Broodbank and Evangelia Kiriatzi	
‘In vino veritas’: raising a toast at Mycenaean funerals	51
William Cavanagh and Christopher Mee†	
Geraki in Laconia in Late Helladic times	57
Joost Crowel	
How warlike were the Mycenaean, in reality?	67
Oliver Dickinson	
Desecrating signs: ‘hieroglyphic’ writing systems and secondary script inventions	73
Silvia Ferrara	
Chronologies should carry a ‘use by’ date: the archaeological life history of the ‘Beth Shan Stirrup Jar’	81
Elizabeth French	
Arthur Evans and the quest for the “origins of Mycenaean culture”	85
Yannis Galanakis	
Man/Woman, Warrior/Maiden: The Lefkandi Toumba female burial reconsidered	99
Kate Harrell	
The Waz-lily and the Priest’s Axe: can relief-beads tell us something?	105
Helen Hughes-Brock	
‘Working with the shadows’: in search of the myriad forms of social complexity	117
Maria Iacovou	
James Saumarez Cameron: a forgotten collector of Cretan seals	127
Olga Krzyszkowska	

The Post-Mycenaean dead: ‘damned if you do, damned if you don’t’	135
Katie Lantzas	
The spider’s web: innovation and society in the Early Helladic ‘Period of the Corridor Houses’	141
Joseph Maran and Maria Kostoula	
‘Metal makes the wheel go round’: the development and diffusion of studded-tread wheels in the Ancient Near East and the Old World	159
Simone Mühl	
“For it is written”: an experimental approach to the materiality and temporality of clay documents inscribed in Linear B	177
Tom Pape, Paul Halstead, John Bennet and Yannis Stangidis	
A ‘wall bracket’ from Kandia in the Argolid: notes on the local character and function of an ‘east Mediterranean’ artefact of the Late Bronze Age/Early Iron Age	187
Lorenz Rahmstorf	
Reading post-palatial Mycenaean iconography: some lessons from Lefkandi	197
Jeremy B. Rutter	
Functions and meanings of Aegean-type pottery at Tel Beth-Shean	207
Philipp W. Stockhammer	
Ceramic developments in coastal Western Anatolia at the dawn of the Early Iron Age	223
Rik Vaessen	
Beaker Folk in Thrace: a metrological footnote	233
Michael Vickers	
<i>Rosso antico</i> marble and the façade entablature of the Treasury of Atreus	237
Peter Warren	
Feasts of clay? Ceramics and feasting at Early Minoan Myrtos: Fournou Korifi	247
Todd Whitelaw	
Dressing the house, dressing the pots: textile-inspired decoration in the late 3rd and 2nd millennia BC east Mediterranean	261
Toby C. Wilkinson	

2

How and when did Tel Akko get its unusual banana shape?

Michal Artzy and Jamie Quartermaine

Introduction

When viewed from above, the present shape of Tel Akko, located around one and a half kilometres from Old Akko (Acre), is reminiscent of a banana (Figure 2.1), with its summit located on the centre of its northern edge some 27 meters above sea level. This is the area of the site, which was already urbanised in the earlier part of the 2nd millennium BCE when a formidable rampart was constructed here (Figure 2.2). The northern side was the focus of excavations directed in the 1970s and 1980s by Moshe Dothan and presently being excavated by members of the ‘Total Archaeology Project’ directed by A. Killebrew and M. Artzy. The Na’aman river, or Belos, has meandered on the southern outskirts of the tell and changed its course over many centuries, depositing clay in the vicinity of the site. Sea- and coastline-changes were a significant factor in soil deposition, especially south of the tell. Geological

studies have contributed to the general understanding of the area (Inbar and Sivan 1984; Sivan *et al.* 1999; Zviely *et al.* 2006), although renewed studies will undoubtedly change some of the earlier conclusions (Artzy 2012). Whatever the processes of formation of the site, its present shape seems to be partially attributable to destructive earth works carried out by human agents (Figure 2.3). The blame has, in the past, been solely directed at the British Mandate, which, in the 1940s, carried out a major effort to combat the swamps formed by the Na’aman river south of Tel Akko. It had been suspected that as much as a quarter of the tell had been removed, if we assume that the original shape was a perfect oval shape. Evidence for considerable earth works is provided by the spread of a large number of sherds and other remains, dated mainly to the 2nd and first part of the 1st millennia BCE, across the former Na’aman swamps to the south and south-east of the tell. However, dating the presumed deformation of the tell has proven



Figure 2.1. Tel Akko in relation to the historic city of Acre and an aerial photograph of the tell (inset, satellite image courtesy of Digital Globe, 2013).



Figure 2.2. Section through the *glacis* of the northern rampart of the tell revealed during the 1973-74 excavations.

difficult until now, leading to a suspicion that the banana shape is to be attributed to a period preceding the British Mandate works, at least partially.

The site of Tel Akko – also named Tell el Fukhar, ‘the hill of the sherds’, Toron, or more commonly, ‘Napoleon’s tell or hill’ – is set back from the Old City of Acre (St Jean d’Acre, modern Akko), which was the Crusader capital. The Old City became an important Ottoman town and an international harbour, which withstood Napoleon’s siege in 1799. It is often said that Napoleon’s army placed the canons on the tell, hence its most commonly used name. This does not agree, however, with early maps which show no signs that either Napoleon or his army could have placed their gun positions there. On the contrary, most relevant maps place the troops behind and to the north of the tell. Napoleon’s attempt to conquer Acre/Akko failed, and with it his attempt to control the coast in order to bar the Ottomans and the British navy supply route from the southern Levant.¹

At Tel Akko, archaeological excavations have documented intermittent habitation of the site until the 2nd century BCE (Artzy 2012). The place was also mentioned in antiquity, possibly in the Ebla archives, and more certainly in Egyptian, Ugaritic and Assyrian texts as well as in the Bible (Artzy and Beeri 2010). Recent studies have focused on the surrounding landscape’s unusual formation, which is due to its coastal location. Changes in the river or shoreline have led to corresponding

¹ We wish to thank Idan Shaked for his helpful discussions of the maps with one of the authors (Michal Artzy).



Figure 2.3. Aerial photograph of Tel Akko showing the area of undulating ground in the southern indentation.



Figure 2.4. Aerial photography of Old Akko taken in 1918 by the German air force showing Tel Akko and its disturbed southern section.

adaptations of the layout and axis of an extended living site. As part of the new ‘Total Archaeology Project’, an extensive re-study of the landscape was undertaken. Alongside Electrical Resistivity Tomography (ERT), Ground Penetrating Radar (GPR) and geological studies, this involved the collection of maps, aerial photos and paintings of the site and its surroundings from different times. This data now allows us to examine the shape of the site using the earliest records of Saint Jean d’Acre in the Crusader period, maps from the 17th to the early 20th centuries, as well as aerial photographs, the earliest of which is dated to the early 20th century.

Tel Akko in pictures

One approach to the question of the shape of the tell, and the extent of destruction attributed to the 1940s, was to study the earliest aerial photographs and maps. There are several photos dating to the early teens of the 20th century of Acre/Akko, carried out by the German air force during World War I (WW1), but the tell itself is not visible in most of them: interest seems instead to have focused on the ‘modern’ town and the area north of it, especially along the coastline. In one photograph (Figure 2.4), the southern edge of the tell is just discernible. Close scrutiny of the south-western part of the tell in this photograph corroborates the suspicion, that, at least partially, the area was already disturbed, although it is not possible to establish the extent of the disturbance from this photo.

Between August 1925 and August 1926, the area was mapped by Joseph Treidel. He surveyed between the Carmel Ridge and Akko for the Palestine Jewish Colonization Association (PJCA), covering the coastal sand dune areas, as well as further inland. His map included the site of Tel Akko, which he knew as Tell el Fukhar, as well as the surroundings, the Na’aman river part of the *kurkar* (sand stone) ridge (Artzy 2012). A comparison of Treidel’s map of Tel Akko with that produced for the current archaeological project (Figure 2.5), showed that the northern side of the tell matched closely with the modern mapping, but the southern side did not show the accentuated disturbed area that is now evident and which was seemingly shown on the earlier German photograph. This could mean that some earth was removed between 1926 and the first years of the State of Israel. The alternative is that the mapping by Treidel of the southern part of the tell was less precise than that for the northern side, potentially indicating that the survey was undertaken primarily using survey stations located to the north of the tell.

In a picture of the tell, taken from its south-eastern confines towards the west and north-west in the 1930s by the famous archaeologist William F. Badè, apparent extensive damage to the southern portion of the site can be discerned. Badè came to Tel Akko in 1935 following the last season at Tell en-Nasbeh and photographed the site, especially its northern confines (Figure 2.6). His intention was to start an excavation in 1936. If one is to conclude by the number of pictures he took of the impressive northern

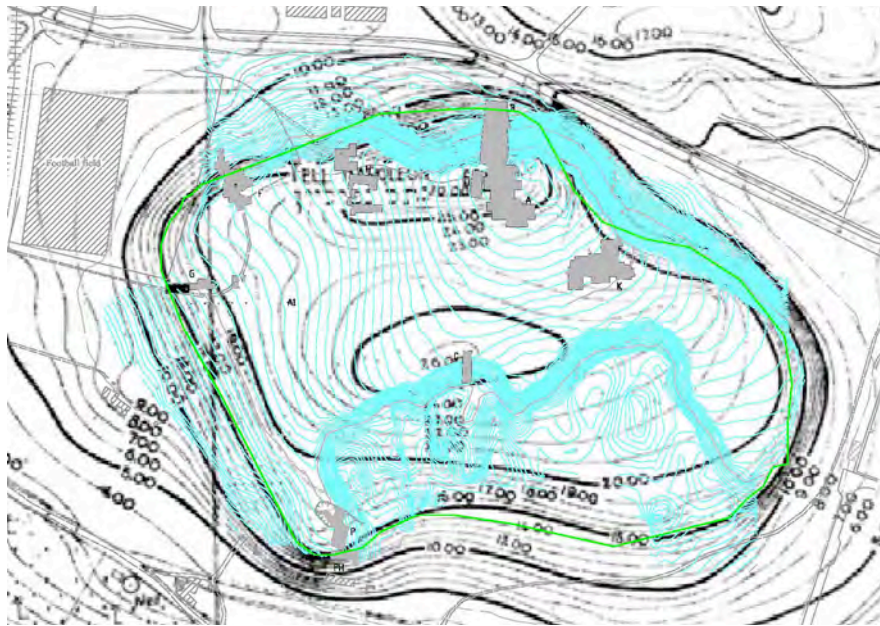


Figure 2.5. Detail of Joseph Treidel's map of Tel Akko (1925-6) superimposed on a modern topographic map of the tell.

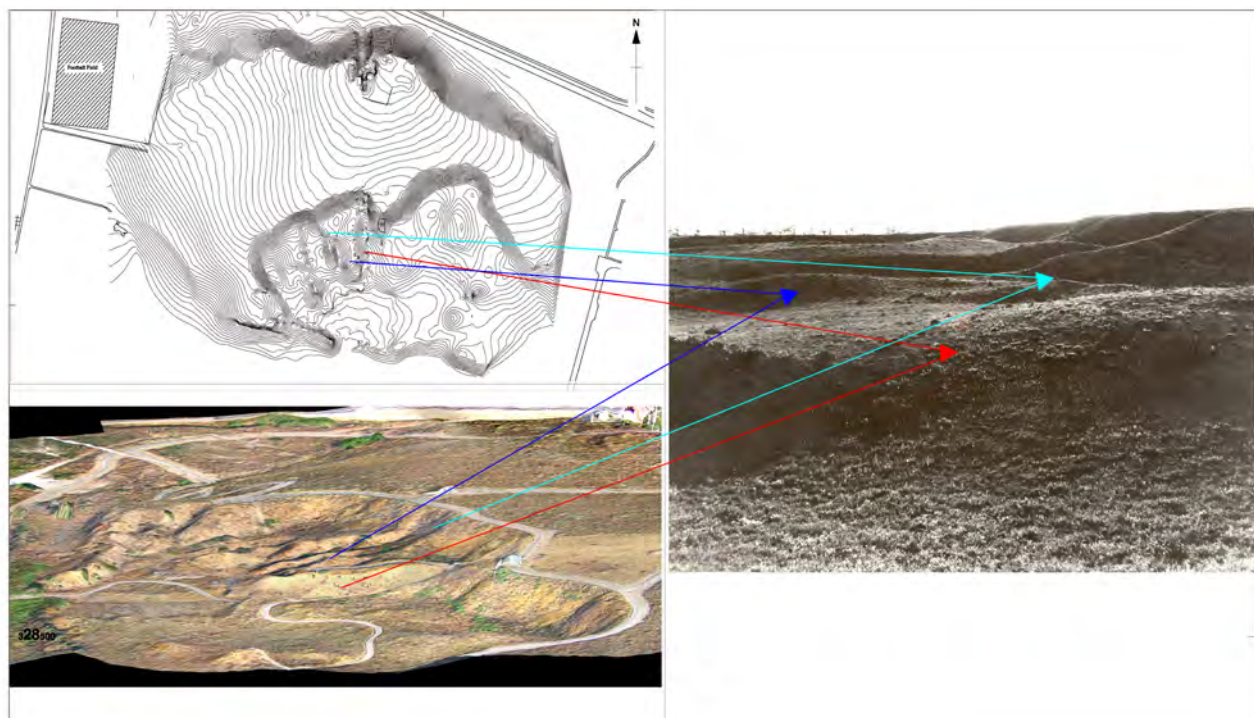


Figure 2.6. Ground photograph of the disturbed southern indentation of Tel Akko by William F. Badè in 1935 looking west towards the Old City (right), alongside a modern computerised model of the tell as plan (top left) and in isometric view (bottom left).

side of the tell versus the few of the lower southern edge, it would be that his intentions – much like those of Dothan in the 1970s – was to start his project on the northern side. Badè died prematurely in March 1936, before the excavation was to begin.² The damage or gaps detectable in

the German photograph are also clearly visible in another 1936 picture.³ It is clear then that the destruction of the tell had begun well before the British swamp-drainage project of the 1940s.

² His son, the late William George Badè, who travelled with his father as a child during his visit to Akko in 1935, shared the information with Michal Artzy in 2011, when the latter gave a lecture at the Pacific School of Religion, Berkeley California.

³ We wish to thank Prof. Aaron Brody, the present director of the Badè Museum for supplying us with photos of Tel Akko taken by the late Prof. William Badè.

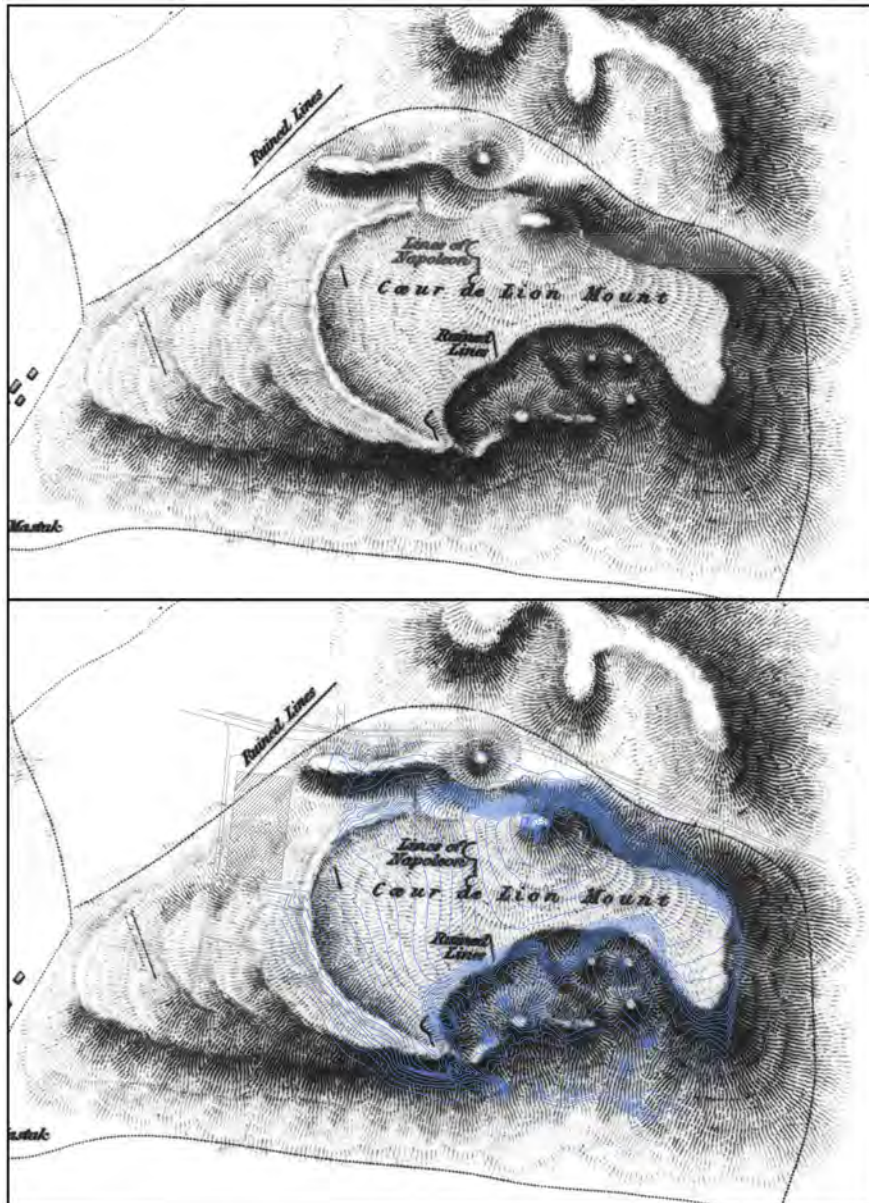


Figure 2.7. Map from the early 1840s made by Symonds and Skyring (above) and superimposed on a modern topographic map (below).

Avner Raban postulated that, at least some of the 'destroyed' area might have been utilized as an inner anchorage based on the course of the Na'aman river in antiquity. This explanation suggested a partial answer for the strange shape of the site (Raban 1991). Yet with the recent geological studies, the probability of such an explanation is waning. Boreholes carried out in this area in 2013 indicated that the *kurkar* bed lies very close to the modern ground level and thus an anchorage within the confines of the tell is impossible. A possibility does, however, exist that there was an anchorage based on the coast, which, during the Bronze Age, extended to the southern entrance of the tell and that the low *kurkar* shelf was used as a landing area for marine activities.

These results prompted us to search for clues which might throw light on the shape of the tell in earlier periods. We

became aware of a map produced following the maritime battle in 1840 between the combined forces of the British, Austrian and Turkish navies and the Egyptian Pasha, Mehmet Ali. The British navy was under the command of Admiral Sir Robert Stopford, his second-in-command Commodore Sir Charles Napier (Goren 2011: 97-106). The map (Figure 2.7) was surveyed and drawn by Symonds and Skyring in the early 1840s, probably within a year or two of the battle. A similar map was published by Alderson in 1843 in which only Symonds was mentioned. For this period, this is by far the best representation of the tell, which can clearly be identified when the map is superimposed with a modern topographic map.

There are other maps of the period, albeit a bit later. Lieutenant, later Admiral, B.G.D. Bedford of the Royal Navy presents Tel Akko as an elongated hill extending

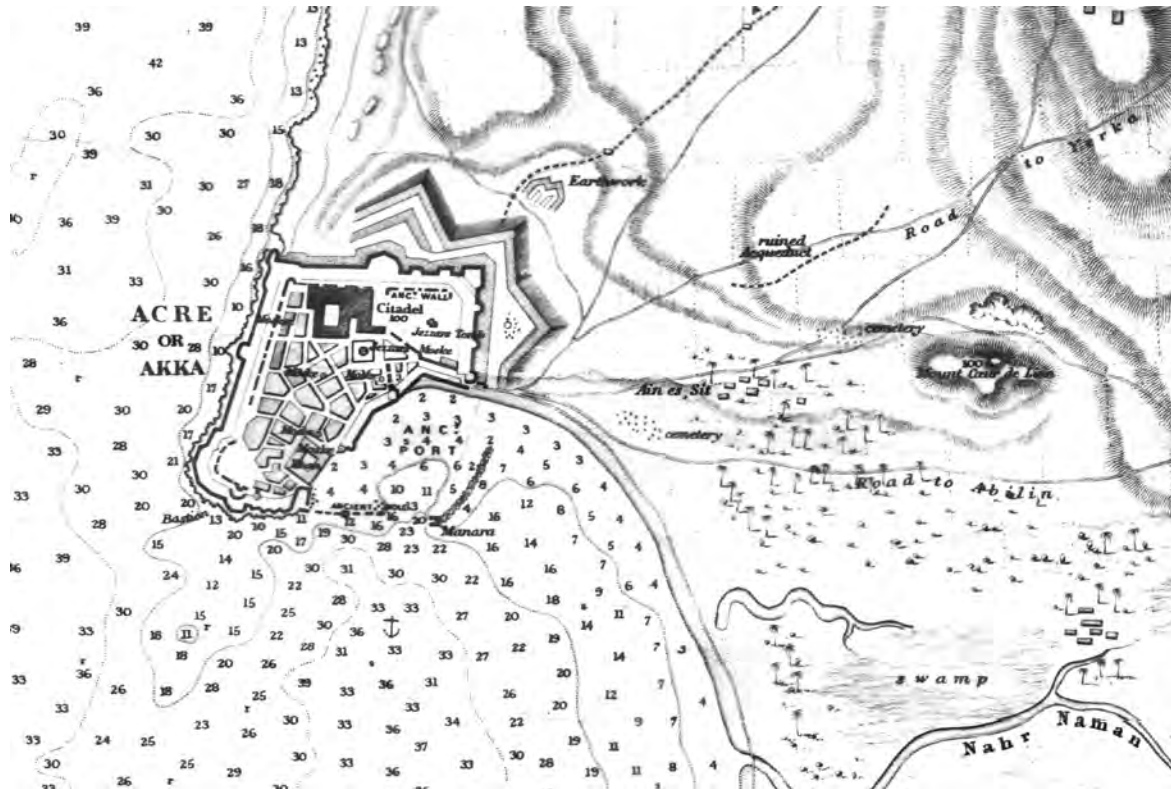


Figure 2.8. Map of the Old City and environs by Lieut. B.G.D. Bedford dated probably to 1862, with enlargement showing the tell (inset).



Figure 2.9. Map of the Old City and environs by B.R. Davies dated to 1843 providing a schematic representation of Tel Akko.

MICHAL ARTZY AND JAMIE QUARTERMAINE: HOW AND WHEN DID TEL AKKO GET ITS UNUSUAL BANANA SHAPE?

east-west in a map dating to the mid 19th century, probably 1862 (Figure 2.8). Hull and Christian, who worked under the command of Mansell in the ‘Syrian Sea’ mapping project, dated to 1863-65, depicted Tel Akko as a flat, almost banana-like tell. These are maritime maps – the terrestrial elements in them were of secondary importance and not emphasized – so it is hard to discern the exact physical situation of the site. Nonetheless, the representation of Tel Akko, emphasizes an indentation in the hill on its southern side and we have to conclude that already by the mid 19th century, this, more or less, was the shape of the tell. The name of the site is of interest; while earlier it was usually referred to as the Toron (‘tower’), in the mid-19th century it is referred to as ‘Mount Coeur de Lion’, possibly echoing the Crusader occupancy of Acre in the 12th and 13th centuries CE.

Napoleon’s battle for Acre/Akko in 1799 prompted the production of maps of the area and included Tel Akko. The earliest maps date to the end of the 18th century, with an interesting one from 1799 attributed to British cartographer, B.R. Davies, although it was edited and only published in 1843 (Figure 2.9). Davies documented the positions of the French and Turkish forces during the siege of Akko by Napoleon’s army. The map was schematically drawn and in an east-west orientation, but when realigned north-south, the tell has a clear indentation on its south-western side. The artificial rampart of the northern side of

the tell, mentioned above, is also clearly indicated. In the map, the site is marked as being used as a “Retrenchment commenced by the Turks”. The French troops were situated north of the road leading to Damascus and not on or even near to the tell. This would indicate that Napoleon is very unlikely to have placed his guns there. The original map, assumed to be the one on which the edited map in the mid-19th century is based, also shows, very clearly, an indentation in the southern edge of the tell (Figure 2.10).

Similarly-dated French maps are also of interest. One of these is attributed to the French Engineer Corps, the *genie*, produced in 1799, but edited and published later by A.J. Denain in the mid-19th century. Several versions of this map exist, but in all of them the shape of the tell is that of a banana with a clear indentation in its southern part. When heights are shown, there is an emphasis on the northern and eastern edges of the tell, and this is in line with the topography shown on Treidel’s map, in Badè’s photos, and its present state. This French map is significant because, in contrast to its British counterpart, it was geometric, rather than schematic. When superimposed over a modern version (Figure 2.10) there is a very close correlation between each in the shape of the tell around its northern side. Around its southern side there is also a relatively good match for the present day scarp slope of the tell. This would suggest not only that the disturbed southern section was in existence at the end of the eighteenth century but also that its shape



Figure 2.10. Original 1799 map of the Old City and troop dispositions, believed to be the source for the 1843 map by B.R. Davies.

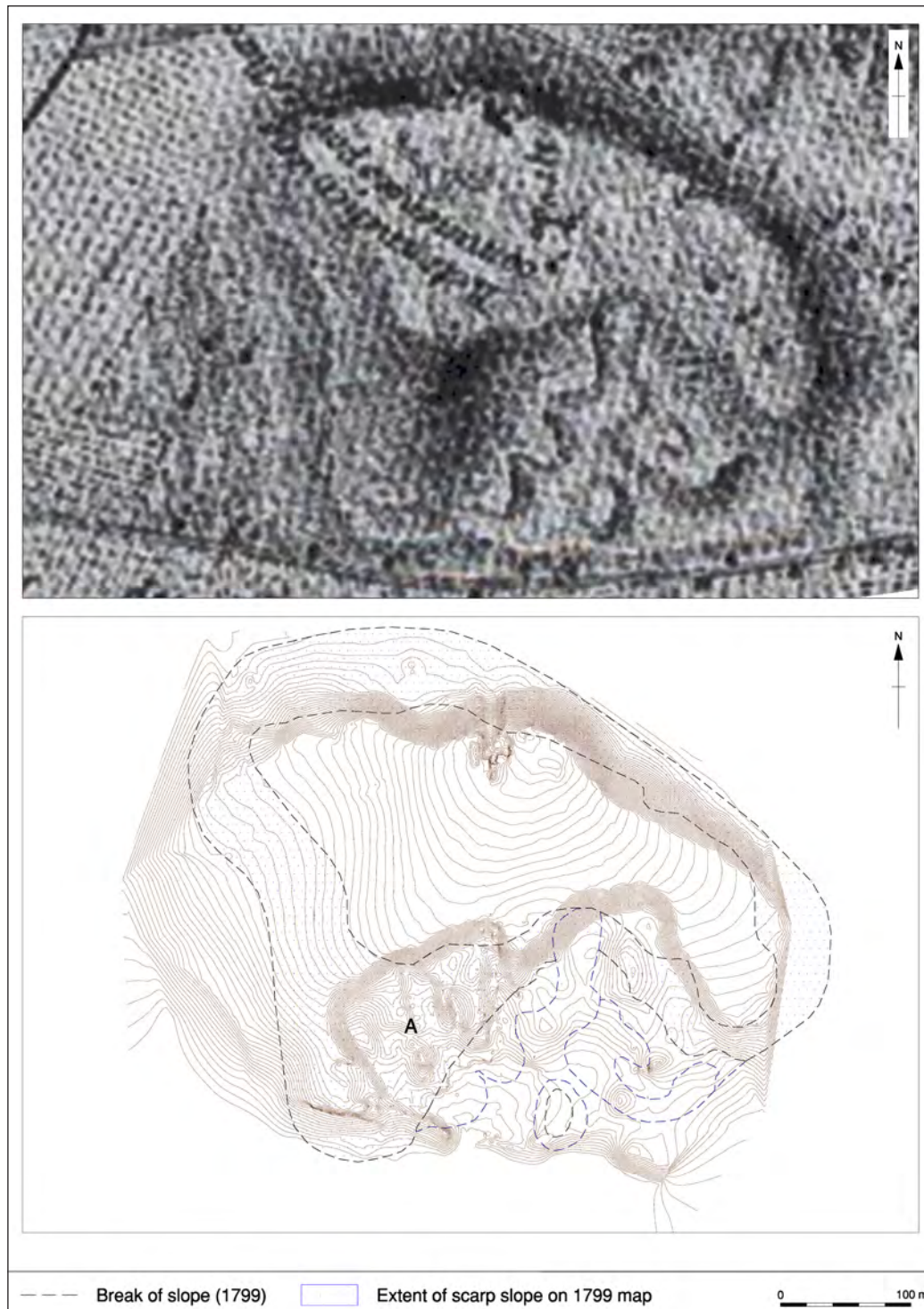


Figure 2.11. Map of the area east of the Old City by the French Engineer Corps, the *genie*, dated to 1799 superimposed on a modern map of the tell.

had not changed significantly since that date. While there are slight differences between the French 1799 map and the modern map, notably around the south-western edge of the indentation (marked A on Figure 2.11), it is not clear whether these could reflect areas of subsequent excavation by the British during the Mandate period or whether these are simply small inaccuracies in the earlier map.

Another French map is attributed to Napoleon's surveyor, Col. Jacotin, and was produced as part of the general survey carried out during the campaign. This particular map is, unfortunately, not detailed enough, especially in the coastal area near St Jean d'Acre, the area which withstood the French attempts, to be useful in trying to understand the general shape of the tell and its surroundings. Not surprisingly, there are clear similarities between the French

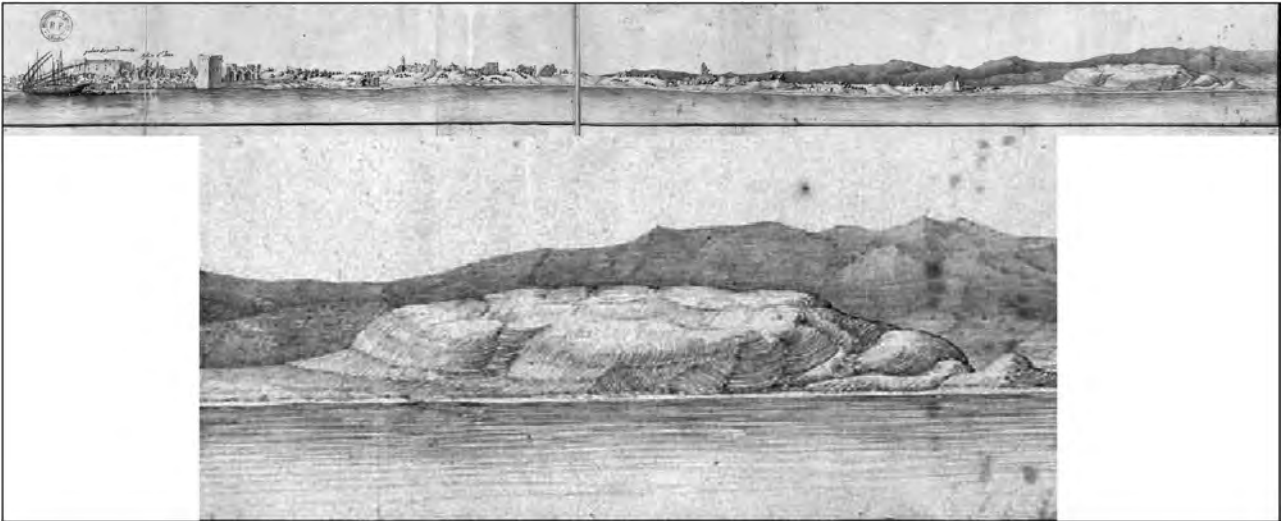


Figure 2.12. Painting of St Jean d'Acre by Gravier d'Ortières for King Louis XIV, dated to c. 1685-87, showing view from the bay.

and the English maps, especially those edited during the middle of the 19th century. While the shape of the tell is similar in the originals there are some small differences, which have mainly to do with the position of the French forces and the tell itself was not the focal point.

In 1738, Richard Pococke, Bishop of Meath, visited the area and drew a map of St Jean d'Acre. Unfortunately, his map does not include the tell or its surroundings, but he did write a verbal account in which he describes the tell, including an estimate of its size:

As Acre is so remarkable in history, I took some pains in examining the ground and country about it. Half a mile east of the city is a small hill, improved by art; it is about half a mile in length and a quarter of a mile broad, and is very steep every way, except to the south west. This was probably the camp of the besiegers, as it was a fine situation for that purpose; and the Pasha pitches his tent on this hill when he goes the yearly circuits to receive his tribute. To the north of this there is an irregular rising ground, where there are great ruins of vaults, some of which seem to have been reservoirs of water... (Dichter 1973: 37)⁴

So far, no maps earlier than those mentioned above have been identified. There is, however, a painting of the Akko bay from the sea, in which the tell is viewed from the west. Its main object is Acre/Akko as it was in the 17th century CE. The picture was produced between 1685 and 1687 for King Louis XIV of France. Kedar (1997) studied the picture and mentions that it is usually attributed to Gravier d'Ortières, captain of the ship Jason, who was sent on a

mission by Louis XIV. One of the paintings (number 14 of the collection) shows the ruins of the city from the south and the tell from the west. A photo of the painting was published only in 1934 (Kedar 1997: 164).

...A glance at the original in the *Bibliothèque Nationale* in Paris, reveals that the apparently integral publication by Rey and Deschamps reproduced only about one third of the original... At the eastern extremity of the ruins, which is close to the tell of ancient Acre (that is, *Le Touron* of the Crusaders)... (Kedar 1997: 165)⁵

Since this painting was drawn as if from the sea, the north-western, west and south-western part of the tell were noted. In what is likely the south-western side of the tell, one can discern an indentation in what should be the westernmost portion of the southern tell and a possible entrance to the site from the north-western corner, which is no longer there due to the establishment of a modern soccer field (Figure 2.12). Another explanation might be that it is the area, now a visitors' entrance, which is located between Dothan's excavations areas F and H (Figure 2.13). If the perspective of the painting is to be interpreted this way, however, the south-eastern part of the tell is masked and so the painting cannot cast light on whether this area had a substantial southern indentation.

Unfortunately, despite the fact that Akko served as the Crusaders' major port and, following the fall of Jerusalem, as their capital, no maps or drawings of the 'Old City' include the tell and its outskirts. There are, however, written sources which mention the tell and its surroundings dating to the Crusader period, at least by the 13th century CE, most of which were assembled by M. Rey (1878). For example, when king Guy de Lusignan laid siege to

⁴ We follow Dichter's account of Pococke's writing since the authors were unable to see the original work: Pococke, Richard. 1745. *A Description of the East and Some Other Countries, Vol. II Part I: Observations on Palestine or the Holy Land, Syria, Mesopotamia, Cyprus, and Candia*. London: W. Bowyer, p. 54.

⁵ We would like to thank Eliezer and Dr. Edna Stern of the Israel Antiquities Authority for supplying us with a copy of the painting.



Figure 2.13. Topographic map of Tel Akko showing areas of archaeological excavation.



Figure 2.14. Section of Area G excavations showing pits in which 13th CE century ceramics were found.

Acre/Akko in 1189 during the Crusades, he took a position on the only hill east of the town, called the Toron, also known as 'Richard Lion Heart tower'. South of the site, there were gardens which extended as far as the Na'aman (Belos) river (Rey 1878: 117). Rey, in the supplement to his first publication of Acre/Akko, published in 1889, provides further description information. Using earlier sources, he is able to describe the surroundings of the tell, the banks of the Na'aman River and the sandy coastal lines (Rey 1889: 10-13). Through his examination of the Crusader period accounts, he discovered that the gardens extending from the northern banks of the Na'aman river to the southern outskirts of the tell – which he calls Tell-el-Foukar – belonged to the Genoese who cultivated orchards there, similar to those in Damascus. He found further descriptions of the area associated with the 'Toron', on the flat top part of modern Tel Akko, where the Templar Order had a building, gardens and vineyards.

This information is in accordance with data which emerged from the archaeological excavations in area H, the flat top of the tell (Figure 2.13), where in the 1983-84 seasons architectural remains dating to the 13th century BCE were noted (Artzy and Beeri 2010). Only a limited excavation was carried out in the area at the time. Most of the finds from the area could be attributed to fills, bearing ceramics from various periods. Only in one part of this area, squares P-O 1, were clear architectural remains found. However, the stones of the constructed layers were robbed and only parts of the foundations were found. These contained ceramics from mixed periods, including the 13th century CE. West of area H, in area G, in the 1999 excavation, small pits were noted, although they baffled us at the time. Only recently did we realize that, since these small pits contained – much like most of the upper layers in the site – mixed deposits of late Persian/Hellenistic sherds as well as occasional 13th century CE sherds, they might actually represent the remains of the pits prepared for the planting of vines surrounding the Templar 'toron'. This probably followed the removal of blocks from a large building dating to the 1st millennium BCE for secondary use in the construction of a massive building noted in the 1980s excavation of Area H in the middle of the site of Tel Akko (Figure 2.14), which is attributed to the 13th century CE, the Crusader period. The stones of this building, in turn, were robbed for the construction of the later Ottoman structures on the site of Akko/Acre.

Discussion and Conclusions

Aerial photographs, and maps from the late 18th, 19th and early 20th century, all provide clear witness to the fact that Tel Akko already bore a clear indentation on its southern edge by 1800 and probably looked very similar to how it does today. While there may have been quarrying of the tell during the British Mandate it is very clear that it was not on the scale that had previously been envisaged. Presumably workers, in their attempt to drain the swamps of the Na'aman river, removed a small amount of earth from the south, or south-eastern part of the tell. Some

kurkar stone utilization, as can be seen by a drill hole for an explosive charge in one of the rocks in the southern area, can also be dated to the 20th century. But the banana-like shape clearly precedes the 18th century and its origins must be sought further back in time.

The ecological formation of Tel Akko, situated on an active coast, should be taken into consideration, and the area has undergone extreme changes over the millennia. Geomorphological work has shown that the area was inundated in the early Pleistocene (Zviely *et al.* 2006). The *kurkar* ledges, most likely represent small islands formed in the process of the inundations and receding coastline (Artzy 2012). A similar geomorphological situation can still be observed just north of the Akko Bay, in the Achziv area, where the islands are still located in the sea. The changes in the coastline could have contributed to the general shape of the tell, the development of habitation patterns, and of its shape.

Nonetheless human damage in the southern area is clear. There appears to have been relatively little activity in the general area of the tell and its surroundings between the Crusader period, the 13th century CE, and the 18th century. Raban (1991) was the first to question the theory that the damage should be attributed to the British mandate alone, but while he proposed several 'whodunnit' possibilities, he did not follow up on his arguments. He did, however, mention that the Arabic name of the tell – 'el Fukhar' – could be taken to mean 'the tell where clay is gathered' rather than 'the tell in which numerous sherds were found'. Indeed, the ramparts could be a rich source of clay for the production of ceramics, but especially pisé and bricks. Raban presented an example in which a broken Mamluk jar was found at the bottom of a cut through the Middle Bronze IIa gate, in the mud-brick rampart in area F of the same date. This cut was clearly discernible in the section, and might represent the results of clay 'mining' at the site, starting way above the place it was found (Raban 1991). While it is quite possible that the Bronze Age building materials were re-used in later times as a source of clay, we cannot accept the suggestion that the damage in the southern part of the tell was done during the Mamluk period. The primary reason is that the south-western part of the tell is not a clay brick rampart. In other areas of the tell, especially its northern side, areas A and H, we did not find any evidence for such practice. In addition, hardly any remains from this period were noted on the tell.

We propose instead that some damage on the southern side of the tell may have been caused by works carried out in the 12th and 13th centuries CE by agricultural tillage. The soil originating in habitation areas would be likely to contain larger amounts of the nutrients needed for higher yields. Thus the tell's remains, especially the occupation layers and ramparts' remains, could have been harvested as fertilizer so as to produce the orchards reported in archives (Rey 1889). These earth works, much like those carried out during the British mandate, may, therefore, have contributed to the southern indentation. At this juncture, it

is a hard hypothesis to validate conclusively, but it is one that should be taken seriously until further evidence can disprove it.

The question remains of the shape of the tell in antiquity, especially in the first part of the 2nd millennium BCE when extensive urbanization of the area surrounding the tell took place (Dothan 1976; Dothan and Raban 1980; Artzy and Beeri 2010; Kaniewski *et al.* 2013). At this time, we cannot answer what shape the Middle Bronze IIa fortification of Tel Akko took – although we know it consisted of an impressive rampart. In fact, so far, we cannot even determine the physical extent of the rampart and whether it encircled all of the site or only parts of it. What is evident is that the northern side of the site was well defended with an impressive constructed rampart. In the south-western confines, however, there was a likely massive *kurkar* ridge bordering on what was, at that time, a bay. This was observed in the results of an ERT examination carried out by Dr Paul Baumann and his crew, from the WorlyParsons Company. There are some remnants of a rampart in the southern edge of the assumed confines of the tell, but how each of these parts was associated with the others remains, as yet, unknown (Artzy 2012). We venture to suggest that not all of the tell was settled at all times, from the Middle Bronze II period, in the early 2nd millennium BCE to the Hellenistic period in the early 2nd century BCE. But this, by itself, does not fully explain the strange, ‘banana’ shape of the tell, which, as we have shown, precedes the earth works carried out in the 1940s, by the British Mandate, to drain the swamps of the Na’aman River.

References

- Artzy, M.
2012 Return to Tel Akko, its anchorages, harbor, and surroundings. *The Leon Recanati Institute for Maritime Studies News* 2012: 5-14.
- Artzy, M. and R. Beeri
2010 Tel Akko. In A.E. Killebrew and V. Raz-Romeo (eds.), *One Thousand Night and Days. Akko through the Ages*, 15-24. Haifa: Hecht Museum, University of Haifa.
- Dichter, B.
1973 *The Maps of Acre*. Akko: Municipality of Acre.
- Dothan, M.
1976 Akko: interim excavation report first season 1973/74. *Bulletin of the American Schools of Oriental Research* 224: 1-48.
- Dothan, M. and A. Raban
1980 The sea gate of ancient Akko. *Biblical Archaeologist* 43(1): 35-39.
- Goren, H.
2011 *Dead Sea Level: Science, Exploration and Imperial Interests in the Near East*. London: I.B. Tauris.
- Inbar, M. and D. Sivan
1984 Paleo-urban development and Late Quaternary environmental change in the Akko area. *Paléorient* 9(2): 85-91.
- Kaniewski, D., E. Van Campo, C. Morhange, J. Guiot, D. Zviely, I. Shaked, T. Otto and M. Artzy
2013 Early urban impact on Mediterranean coastal environments. *Scientific Reports* 3: 3540 (5 pages). DOI: 10.1038/srep03540.
- Kedar, B.Z.
1997 The outer walls of Frankish Acre. *Atiqot* 31: 157-80.
- Raban, A.
1991 The port city of Akko in the MBII. *Michmanim* 5: 17-34.
- Rey, M.E.G.
1878 Topographie de la ville d’Acre au XIII^e Siècle. *Mémoires de la Société nationale des Antiquaires de France* 39: 115-45.
1889 Supplement l’étude sur la Topographie de la Ville d’Acre au XIII^e Siècle. *Mémoires de la Société nationale des Antiquaires de France* 49: 1-18.
- Sivan, D., G. Gvirtzman and E. Sass
1999 Quaternary stratigraphy and paleogeography of the Galilee coastal plain, Israel. *Quaternary Research* 51: 280-94.
- Zviely, D., D. Sivan, A. Ecker, N. Bakler, V. Rohrlich, E. Galili, E. Boaretto, M. Klein and E. Kit
2006 Holocene evolution of the Haifa bay area, Israel, and its influence on ancient tell settlements. *The Holocene* 16(6): 849-61.