Kate Raphael

# THE EXCAVATION OF THE TEMPLAR FORTRESS AT JACOB'S FORD
(1993-2009)

*In Memory of Professor Ronnie Ellenblum*

האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

HEBREW UNION COLLEGE JEWISH INSTITUTE OF RELIGION

# THE EXCAVATION OF THE TEMPLAR FORTRESS AT JACOB'S FORD

(1993-2009)

In Memory of Professor Ronnie Ellenblum

by
Kate Raphael

With contributions by
Amotz Agnon, Reuven Amitai, Yael D. Arnon, Miriam Belmaker, Uri Berger, Ronnie Ellenblum, Ron Kehati, Robert Kool, Nili Liphschitz, Shmuel Marco, Emma Miller, Piers Mitchell, Hadas Motro, Yossi Nagar, Assaf Peretz, and Rivka Rabinovich

האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM


Annual of the
Nelson Glueck School of Biblical Archaeology
Hebrew Union College—Jewish Institute of Religion
Volume XIII
2023

ISBN: 978-0-87820-511-0
Jerusalem 2023

Hebrew Union College – Jewish Institute of Religion
Editor-in-chief: David Ilan
Copy editing: Sherry Whetstone
Layout: Anna Hayat
Printed by: Printiv

Front cover: The Templar fortress at Jacob's Ford looking west (photograph by Miki Golan)
Back cover: Professor Ronnie Ellenblum, Mongolia 2010 (photograph by Itamar Biran)

# TABLE OF CONTENTS

# PREFACE

In any given year, 20 to 30 large-scale excavations are carried out in Israel, both salvage excavations and academic excavations guided by formulated research questions. The research-guided excavations are almost always multi-season projects. In the process data accumulates, loose ends proliferate, staff members move on to other projects, and sometimes funding runs out. The result is that far too many excavations never see the final publication of the large data sets that allow for continued, nuanced analysis and interpretation. We are left with a few targeted articles without the fuller context upon which interpretation is based.

This could have been the fate of the Templar fortress at Jacob's Ford (Metzad Ateret) had it not been for the dogged commitment of Kate Raphael, who was a novice archaeologist participating in the excavation in the 1990s. Kate went on to specialize in the archaeology of late antiquity and the medieval period, completing her PhD at the Hebrew University and writing numerous papers and books including *Muslim Fortresses in the Levant: Between Crusaders and Mongols* (Routledge, 2011) and *Climate and Political Climate: Environmental Disasters in the Medieval Levant* (Brill, 2013). But she never lost sight of Ronnie Ellenblum's excavation of the fortress at Jacob's Ford.

Kate knew our process and our product and approached me with a proposal to publish the Jacob's Ford fortress in our final publication series. But what she proposed did not conform to the format typical of archeological reports. This volume was to contain much more historical narrative and analysis and was to include expansive footnotes, heaven forbid! On this Kate insisted, explaining that the extensive textual documentation available and its deep historical analysis required a different format, and footnotes. Well, I acceded.

This volume covers the medieval period only—the Templar fortress and its aftermath. The earlier levels excavated—mainly of the Iron Age and Hellenistic periods—will be published in another volume under the aegis of the Hebrew University's Institute of Archaeology.

Reading the chapters of this book, one grasps that the people who worked with Ronnie developed an affection and admiration for him as a teacher, a scholar, and as a human being (see Reuven Amitai's obituary at the end of this volume). It is a great shame that he was taken from us. But this fine volume is an everlasting monument to his scholarship and his memory.

David Ilan, Director
Nelson Glueck School of Biblical Archaeology
Hebrew Union College-Jewish Institute of Relgion
Jerusalem, October 2023

# ACKNOWLEDGEMENTS

The team of archaeologists at the excavation of the Templar fortress at Jacob's Ford was a remarkable bunch, and deserves most of the praise and thanks. Many were still students when the dig started. Yoav Arbel had already excavated in different parts of the world when he joined, and Nitza Bashkin is simply the neatest and best organised archaeologist I have ever worked with. Ohad Zakhiem, a prehistorian, excavated the main gate and extracted the most out of his area — his detailed drawings and funny comments are still my favourite. Yigal Shapira and I were new to field work and were trained by the above team members at the site.

One of our most important team members was Brigitte Puré, who specialized in Crusader pottery, a subject that few archaeologists researched in the early 1990s. She patiently taught us all she knew, and it is due to her work in the field that the pottery arrived in the storage room sorted and registered. Tamir Porat, Nati Kranot and Tomi Amit (member of Kibbutz Kfar Hanasi) all slaved along the northern part of the fortress, where the stone blocks from the curtain wall were buried 2–3 m deep!

Rivka Calderon (Pukul) joined the team when the Hellenistic fortification was revealed. She came with a huge fashionable hat and sunglasses and was no doubt the most experienced as well as the trendiest archaeologist on the site. Uri Davidovich, Eran Meir and Roi Porat excavated the early period levels of the tel where the geologists were searching for signs

Left to right: Ohad Zakhiem, Kate Raphael, Yigal Shapira and Nitza Bashkin.

Brigitte Puré (with a white T-shirt) sitting on the far right.

Nati Kranot

Rivka Calderon (with a striped T-shirt)

Uri Davidovich

Eran Meir

of earthquake damage along the southern slope. Uri and Roi found the Hellenistic coin hoard, which plays a prominent role in the understanding of the geological fault. My clearest memory of Uri is the mega-size bowl of cereal he used to eat for breakfast — a quantity that never failed to impress me. Eran was the only member of our team who established an office with a table, a chair and shade.

Hadas Motro was our chief equid expert and zooarchaeologist. She was in a league of her own, the one person who had marked her subject of research for the next decade. She is also the only woman I know to work and excavate when she was seven months pregnant. Her chapter on the equids, written together with Professor Rivka Rabinovich of The Hebrew University of Jerusalem, is the first work of its kind to be published. Yossi Nagar and Neta Lev Tov worked on the human skeletons in the field, a job that demands patience, time, and knowledge that none of us possessed.

The most important men on the dig were those who made sure breakfast was nourishing, filling and served on time — the chief administrators. Bouky Boaz was our administrator and photographer during the first seasons. He does not appear in any of the photographs, he was simply always behind the camera, trying to capture the events of both the twelfth century and the atmosphere on the excavation. Miki Golan and his assistant Stav Yaar who took over from Boukey, could build and fix anything and everything. Some of the best ideas and several of the problems we encountered regarding the construction of the fortress were solved by Miki Golan. Our field kitchen and dining veranda were a mixture of a gipsy and a Bedouin camp — everything was made of recycled wood and metal. I often felt Miki may have been an active member of the Templar building team who travelled forward in time to watch and assist us. In his spare

Hadas Motro

Miki Golan

Robert Kool and Ariel Berman

time, he held a camera and many of the field photographs and aerial shots were taken by him.

Several surveyors worked with us over the years, among them Israel Vatkin and his team from the Israel Antiquities Authority; Gil Kobo who sadly died at a very young age, a great loss to humanity; ‘Anna Yamim, Dov Porotsky and Jay Rosenberg. Many of the plans are not signed and we therefore could not attach a surveyor’s name to the plans that accompany this monograph– we simply did not know who did what.

Robert Kool of the Israel Antiquities Authority, is the best medieval numismatist in the northern hemisphere. We were very lucky to have him join us in the field for a few days. The chapter he wrote for this volume reads like a good detective book. Piers Mitchell analysed the battle wounds and introduced us to the horrors of medieval warfare. I hope that one day he will be able to join us in the field.

The geologists Shmulik Marko of Tel Aviv University and Amotz Agnon of The Hebrew University of Jerusalem worked on our prize finds — the active fault that tore the fortress apart. They never tired of trying to teach all of us how an active fault works, the physics and energy flows, epicentres, and numerous other aspects. I would like to thank them both for all their work over the years in a field whose mechanics are still a mystery to most of us.

The excavation was initiated by Professor Ronnie Ellenblum of The Hebrew University of Jerusalem and carried out together with Dr. Moshe Hartal of the Israel Antiquities Authority and Professor Adrian Boas of Haifa University, who both joined the excavation for the first seasons. They each contributed in their own way and always encouraged an open dialogue. The discussions on the site were perhaps the best school for studying medieval archaeology.

Yael Arnon wrote the chapter on the pottery. We are all in her debt for producing a thorough and

Amotz Agnon (standing in the center with a green shirt)

Adrian Boas (left) and Ronnie Ellenblum

Shai Scharfberg

detailed chapter. Ron Kehati wrote the chapter on the animal bones — I wish he had been part of our team on the dig, his analysis of the material was a real eye-opener regarding the eating habits of the Templars and the Mamluk hamlet dwellers.

Miriam Belmaker, of the University of Oklahoma — Tulsa and her student Emma Miller dealt with the minute rodent bones and provided some remarkable insights from our modest pile of bones. I am very grateful to Uri Berger and Assaf Peretz, of the Israel Antiquities Authority, who offered to sign and seal this book with their chapter on the battle at Jacob's Ford in the First World War — a chapter that derived from a brass button that belonged to the uniform of a British soldier that Yoav Arbel found on the dig.

This book could not have been written without the incredible help, good humour and grace of Shai Scharfberg, who put law and order in the finds and scanned all the field notebooks and photographs. Although he was not part of the field team (he was just starting primary school when the dig began), he was the only person who knew the site from top to bottom, every area and strangely enough, also every archaeologist.

Amir Mazor translated the main body of Arabic texts that accompany the book. Mannie Goodman drew some of the ceramics and Tania Melsten did the illustrations of the kitchen and the mill.

I am truly thankful to the three editors of this book: Leigh Chipman, who has fluent Arabic and a PhD in medieval Middle Eastern history, was well acquainted with all the main historical figures in the story of Jacob's Ford; Ms. Sherry Whetstone, an archaeologist, who thoroughly and methodically corrected the texts, tables, plates and plans; and David Ilan from the Hebrew Union College, read the first draft of the manuscript and agreed to publish this work. David edited the last drafts of the book. His support and practical advice were always a great help.

Many thanks are due to Professor Reuven Amitai, the Eliyahu Elath Chair for Muslim History at the Department of Islamic and Middle Eastern Studies of the Hebrew University for finding the funds and for his unstinting support. I am truly indebted to Professor Asher Cohen, the president of the Hebrew University of Jerusalem, who provided the generous funding for the research and publication of this volume. This book was partially funded by a grant from The Israel Science Foundation (grant no. 255/2) given To Professor Mustafa Abassi and Kate Raphael, Tel Hai Academic Colledge.

We would like to thank the volunteers who joined the excavation over the years. Most of them were Israeli youth from all over the country. I was sitting on a local bus in central Burma many years after the excavation ended, when three young Israeli women with backpacks sat beside me. After a few minutes' conversation, one of them said I looked very familiar. Seconds later she remembered that she and her two friends that were with her on the bus excavated with us at the fortress of Jacob's Ford. It was an outstanding excavation, mainly because of the people who participated in this project.

Any mistakes and faults in this study are entirely my own. Perhaps they will be corrected one day when the next season of excavation starts at the Templar fortress at Jacob's Ford.

CHAPTER 1

# INTRODUCTION

While there are many Crusader sites and fortresses in Israel, the archaeological excavation of the Templar fortress at Jacob's Ford was a somewhat different and unusual project. Although we did not know it at first, we were excavating a fortress that had never been completed, a fortress that existed for only eleven months. None of the detailed Arabic or the brief Latin descriptions divulge the fact that the fortress was still being constructed when it was besieged by Saladin. The archaeological evidence, however, was very clear. The goal of the excavation was to study the methods of building and follow the timetable and development of the site's construction during those eleven months. Professor Ellenblum had a list of questions regarding its construction and plan. What do you build first? The curtain walls? The water cisterns? Or perhaps the kitchen? How many labourers were needed? What type of plan did the Templars choose for their new fortress? How much did it cost?

There is no manual for how to build a Crusader fortress. Each site has its advantages and drawbacks; Jacob's Ford, however, displays a longer list of faults than most fortified Crusader sites. It was built on the road to Damascus, on the west bank of the Jordan River next to the ford that carries the same name (Fig. 1.1). The fortress was constructed on a low mound, devoid of natural protection, a truly peculiar choice for a frontier fortress on the threshold of Damascus, the seat of the kingdom's most formidable enemy.

## The name

The name of the Templar fortress used by contemporary Arabic sources derives from local traditions that identify the ford as the place where the Patriarch Jacob learnt about the apparent death of his son Joseph. The Arabic sources refer to the shrine and the fortress as *bayt al-aḥzān* —'the house of sorrow,' or *al-mashhad al-yaʿqūbī* (the site of veneration of Jacob).[1] The ford was known

1 Notes on transliterations: Arabic terminology is italicized and transliterated according to the journal *Mamlūk Studies Review* (https://mamluk.uchicago.edu/msr_style_guide_2022.pdf). Common Arabic words such as amir and sultan are written without diacritical points. Place names are written in the Arabic version as they appear in contemporary medieval sources. The Frankish names are mentioned in brackets, for example Ḥisn al-Akrād (Crac des Chevaliers). When the context deals explicitly with Frankish historical events, the place name appears in the Latin or the old French version. Well known place names appear in their current usage in English (Aleppo, Cairo, Damascus, etc.).


**Figure 1.1.** The location of the fortress, underlined in blue, on the map of the Holy Land produced by Jefferys Thomas (1745).

as *makhāḍat al-aḥzān* 'the ford of sorrow.'[2] The Templars followed the local tradition; the Latin name VADI IACOB 'of Jacob's Ford' was engraved on a lead token found at the fortress.[3] William of Tyre (d.1186) refers to the fortress as Chastellet; he is the first and only Latin source to use this name.[4]

On a map produced in 1745 by Jefferys Thomas, the fortress is marked as *Kaiser Attrah* (*Attarah*, in Arabic means obstacle). The name Metzad Ateret (מצד עתרת) is the Hebrew translation of the Arabic.[5] It seems that sometime, perhaps during the Ottoman period, the historical name was replaced. This usually indicates a long break in the settlement of a site.

2 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–98.

3 See this volume, Chapter 17 by Robert Kool, on the coins found at the fortress.

4 William Archbishop of Tyre, *The Deeds Done Beyond the Sea*. Tr. E. A. Babcock and A.C. Krey (New York, 1976), Book XXII, Chapters 10-12.

5 Kaiser is the common word for fortress in Arabic, Metzad is the Hebrew equivalent. Ateret, Jacob's Ford, Kaiser Attrah, Bayt al-aḥzān and Vadum Iacob are used throughout this book.

## The excavation

The excavation began in 1993. It was initiated by Professor Ronnie Ellenblum of the Hebrew University of Jerusalem and carried out together with Dr. Moshe Hartal of the Israel Antiquities Authority and Professor Adrian Boas of Haifa University, who both joined the excavation for the first seasons. There were twelve seasons of excavations, the last being in 2009.

The team of archaeologists changed over the years.

Area supervisors: Yoav Arbel, Nitza Bashkin, Ohad Zakhiem, Yigal Shapira, Rivka Calderon, Tamir Porat, Nati Kranot, Tomi Amit, Uri Davidovich, Eran Meir, Roi Porat and Kate Raphael.

Zooarchaeologist: Liora Kolska Horwitz and Hadas Motro.

Conservation of equid skeletons: Gali Beiner.

Field anthropologists: Yossi Nagar and Neta Lev Tov.

Field pottery analysis: Brigitte Puré.

Photographers: Bouky Boaz and Miki Golan.

Filed administration: Bouky Boaz Miki Golan and Stav Yaar.

Surveyors: Israel Vatkin and his team from the Israel Antiquities Authority; Gil Kobo; ‘Anna Yamim, Dov Porotsky and Jay Rosenberg.

The architectural remains, human and animal skeletons and hundreds of arrowheads portrayed a vivid picture of the building stage the Templars had

**Figure 1.2.** Ronnie Ellenblum (with his back to the camera, on the right, in a black t-shirt) with a group of youth.

reached, the siege, and the battle inside the fortress. The finds brought us as close as one wishes to be to the events that took place during the last days of August 1179, when the Templar fortress was sacked, and the garrison of the most formidable military order was put to the sword and the corpses thrown into a water cistern (that was never found).

The excavation was a remarkable experience, due to the team, Ronnie's ability to bring the history of the site to life, and the finds. During the excavation, Ronnie would often gather a group of youth around him and in a thundering voice, with his hands pointing towards the slope east of the Jordan River, he would conjure up Saladin, the Muslim army, and the Templar knights, and tell the story of the siege (Fig. 1.2). No matter who the audience was, they were always captivated. They sat gripped on the fortress wall and listened attentively to the short and violent tale of the fortress.

This book presents the story of the site and the region in the widest possible context, maintaining a constant dialogue between the written sources and the tangible archaeological evidence. Some of the chapter authors were Ronnie's colleagues and students. Although we think we have a fairly good picture of the chain of events that led to its building, and a reasonable idea of how the fortress was constructed, we never managed to answer all the questions or solve all the riddles the site presented.

Professor Ellenblum died suddenly in January 2021. This book is dedicated to his memory.

CHAPTER 2

# THE TEMPLAR FORTRESS AT JACOB'S FORD AS DESCRIBED BY ADVENTURERS, EXPLORERS, AND SCHOLARS (17TH–EARLY 20TH CENTURIES)

Scholars from Europe and America researching Crusader fortresses almost ignored the Templar fortress at Jacob's Ford.[1] Unlike the powerful scenery and dramatic architectural remains of the Teutonic fortress at Montfort, the Muslim fortress al-Ṣubayba at the foot of Mt. Hermon, or the Templar fortress of Château Pèlerin (ʿAtlit) on the coast, the relatively poor physical remains of the fortress at Jacob's Ford drew considerably less attention. Although no one sketched, prepared a plan, painted, or photographed what they saw, the descriptions of Jacob's Ford written by pilgrims, adventurers, and scholars from different fields from the seventeenth until the nineteenth century are an interesting and important source.[2]

## Accounts written by clergymen

One of the first European travellers to mention the fortress was the Franciscan clergyman Franciscus Quaresmius (d. 1650), who was sent to the Levant by Pope Urban VIII. Much of his time was spent traveling and investigating the sites of the Holy Land. He was clearly in favour of trying to bring the country back under Christian rule, and in one of his sermons he called upon King Philip IV of Spain to organize a new Crusade. Quaresmio was convinced that the Mamluk khan had been built on the remains of the Crusader Fortress:[3]

> *"From the region of the bridge, on the farther side of the Jordan, is the traveller's lodging which I consider to be that fortress which Baldwin King of Jerusalem, the fourth of this name, in the year of our Lord 1178, built on the banks of the Jordan on a moderately high hill, and over the waters of Merom, during a period of six months, to drive off the attacks of the Saracens from Damascus into the Holy Land, committed to the Templars; from the Jordan, which Jacob crossed, it was called the ford of Jacob; Saladin destroyed*

1 Goren, H. 'Go View the Land'. *German Study of Palestine in the Nineteenth Century* (Jerusalem, 1999),136–137.

2 I would like to thank Professor Haim Goren (Tel Hai Academic College, Israel) for all his help and guidance in locating the sources for writing this chapter.

3 Robinson, E. *Biblical Research in Palestine, Mount Sinai and Arabia Petraea* (Boston, 1941), vol. 3: 364, fn. 2.

*it from the foundation, as Tyrius teaches in his [treatise] on the sacred war, Book 18 Chapter 23, and Book 21 Chapter 26, and Book 22 Chapter 22. But now, because both Damascus and the Holy Land are under the dominion of the Turks, or more truly tyranny, it served not as a fortress for defence, but as a lodging place for the habitation of those who collect the taxes from those who cross."*[4]

Thirty-nine years later, Richard Pococke (d. 1765), a high ranking Anglican clergyman, a scholar and a well-established traveller, arrived at our fortress. Pococke visited Palestine in 1737 and 1741. The most interesting points in his account are the round turrets at the corners of the fortress and the eastern and southern gates:

*"On the eastern side of the bridge, Baldouin, the fourth king of Jerusalem, built a fortress against the Saracens on a rising ground, probably on this very spot…. A small mile below the bridge, there is an oblong square hill, which seems to have been made by art; round the summit of it are the foundations of a strong wall; and at the south end, and on the east side, I saw the remains of two very handsome gates of hewn stone, with round turrets at the corners: At the north end there is a great heap of ruins, probably of a castle, the whole is about half a mile in circumference: There are some signs of a suburbs, to the south, on a lower ground, which seem to have been fortified. This place is now called Kaifar-aterah, or Geser-aterah…."*[5]

While the description of the round turrets seems somewhat imaginative, the location of the gates was accurate. The excavations revealed one modest square tower in the south-west corner, a gate at the south and a postern in the east. We never found any evidence of turrets.

The map of the Holy Land that accompanies Pococke's book was produced by Jefferys Thomas, and dates to 1745 (Fig. 1.1 in the introduction). It is the earliest map that shows the fortress, which is marked as *Kaiser Attrah*.

*A Summer Ramble in Syria* (published in 1835) is the title Reverend Vere Monro, an English clergyman, gave his humorous account of his travels in Palestine and Syria. He crossed the bridge at Jacob's Ford, identified the site, briefly mentioned the Frankish King, but adds no description of what he saw. Obviously, he was not very impressed:

*"The caravan, consisting of fifty men, and a hundred and fifty camels, had left the town [Safed] some time before us, and I found the party already encamped upon the rising ground on the left bank of the Jordan, over against Jacob's Bridge, half a mile to the south of the Waters of Merom. Evaporation was beginning to tell upon this small lake, and on the further side reeds and tamarisks were growing up so as to form a jungle. Below the bridge, near one mile to the south, is a small tumulus, where are the remains of a fortress, which I take to be that built by Baldwin IV in 1178, for the defence of the bridge against the Saracens of Damascus."*[6]

---

4 Francesco Quaresmio, *Historica, Theologica et Moralis Elucidatio Terrae Sanctae* (Antwerp, 1639), vol. 2: 872. I am most grateful to Dr. Nurit Shoval (Head of the Department of Classical Languages, Ben Gurion University of the Negev, Israel) for translating the Latin text.

5 Pococke, R. *A Description of the East, and Some Other Countries* (London, 1843), vol. 2: 73.

6 Monro, V. *A Summer Ramble in Syria: with a Tartar Trip from Aleppo to Stamboul* (London, 1835), vol. 2 44.

## Nineteenth-century researchers and surveyors

The American biblical scholar Edward Robinson (d. 1863) is often referred to as the founder of modern scientific and topographical research in Palestine. He surveyed the country twice (in 1838 and 1852), accompanied by Eli Smith, his student. Smith was a well-known biblical and linguistic scholar who had served as a missionary in Lebanon, had lived and travelled in the Levant and was a fluent Arabic speaker. His close relations with the leading German geographers and cartographers led to the recruitment of Heinrich Kiepert as the survey's cartographer.[7] When Robinson and Smith prepared their material for publication, they realized that Quaresmius mistook the khan to be the remains of the Crusader fortress: "The clumsy supposition of Quaresmius, that the Khan is a remnant of Baldwin's castle, requires no further notice."[8] Robinson visited the fortress at Jacob's Ford in 1838 and provides a fairly detailed historical background, alongside a very short description of the fortress ruins:

> *"This passage of the Jordan was however a point of great importance, even in the era of the Crusades. It was here that king Baldwin III, in A.D. 1157, while proceeding from Banias to Tiberias, after having relieved the former place, was surprised by Nureddin; his attendants were mostly captured, and he himself escaped with difficulty to the castle of Safed. In October, A.D. 1178, Baldwin IV laid here, by the ford, the foundations of a new fortress, upon an eminence of moderate height, on the west side of the river. The castle was quadrangular; the walls of great thickness and solidity, and of appropriate height. The whole work was completed in about six months; and gave the Christians the entire control of this important pass. The charge of the castle was committed to the Templars; and it thus formed a sort of outpost to their adjacent and more formidable fortress of Safed. The Christians had carried on the works without interruption from the Saracens, except one or two attacks from robber-hordes. But in June A.D. 1179, not three months after the fortress was completed, it was assaulted by Saladin, at first without success. Having, however, defeated the Christians in a subsequent engagement near Banias, in which the Constable Honfroy was mortally wounded, and the Grand Master of the Templars, and others, made prisoners, the Sultan again invested the castle, became master of it by storm, put the garrison mostly to the sword, and razed the fortress to the foundations. The remains of this castle are doubtless the ruins, which travellers describe as situated on a tumulus-like hill on the west side of the river, about a mile below the bridge."*[9]

John MacGregor (d. 1892) is by far the most outstanding visitor to set foot at the fortress, not least because he chose to travel by canoe in a land that is mostly dry and dusty, on a river that shrinks considerably at the end of every summer. MacGregor was neither a missionary nor a pilgrim. He

7 Goren, H. Edward Robinson, Eli Smith and the Cartography of Berghaus and Kiepert. In H. Goren, J. Faehndrich, and B. Schelhaas *Mapping the Holy Land: The Foundation of a Scientific Cartography of Palestine* (London and New York, 2017), 5–15.

8 Robinson, *Biblical Research in Palestine*, 364, n. 2.

9 Robinson, *Biblical Research in Palestine*, 363-364.

was a knowledgeable adventurer who travelled for pleasure, enjoying the challenges, coping with the dangers and satisfying his keen curiosity. He paddled his canoe, the *Rob Roy*, along the Jordan River and stopped at the fortress of Jacob's Ford:

> *"About a mile below the bridge are some imposing ruins. Their position settles at once that the building was put here to command this important ford. It was, in fact, a castle built 700 years ago, and was given to the Templars, who then held this road. But Saladin took the fortress and razed its proud battlements. Now it is only a disappointing ruin."*[10]

The French scholar Victor-Honoré Guérin (d. 1891) visited Palestine no less than eight times. He surveyed the Galilee in 1875. Guérin was defined by the French as an archaeologist,[11] and was asked by the French Ministry of Culture to carry out a thorough survey of Palestine; he worked and published on his own:[12]

> *"At nine and twenty-five minutes I arrived at Kuser al-A'thara an ancient fortress on a hill that is 250 feet long and 72 feet wide on average, it controls the Jordan from the west and the north, its slopes are covered with high tangled grass and are quite steep in some places, especially in the east. The hill's surface is fairly even and surrounded by a rectangular wall. It was wide, built of small volcanic stones and coated with splendid lime stones, very straight or oblique. Three quarters of this limestone coating has been removed. Each corner of the rectangular was strengthened by a tower, and along each of its lines there was an opening, one to each of the four directions of the sky. Inside the fortress grounds there was nothing to see, apart from at the northern edge at the height of the hill where there was a pile of stones and below it one could see a few walls in situ. According to William of Tyre, the fortress was built by King Baldwin IV in 1178."*[13]

The walls and the gates of the fortress were still visible. This is important mainly because when the team headed by Ronnie Ellenblum and Moshe Hartal first arrived at the site in 1993, only the upper course of the south-east corner could be seen. It thus seems that the fortress's stones were still being robbed in the early twentieth century, gradually reducing the height of the fortress walls. The southern gate and four posterns were covered by a thick layer of earth and could hardly be seen. Other than the modest tower in the south-west corner, the square towers that Guérin describes were never found during the excavation; he may have seen the one tower and concluded that others existed.

Lieutenant C.R. Conder and Captain H.H. Kitchener of the British Royal Engineers Corps wrote a short description of the site during their survey of Western Palestine, conducted on behalf of the Palestine Exploration Fund (PEF). The survey lasted six years (1871–1878), during which they produced detailed maps and published six volumes that describe the geography, topography, archaeology, anthropology, fauna, flora and numerous other

10 Macgregor, J.M. *Rob Roy on the Jordan* (6th edition, London, 1880), 274.

11 Guérin, M.V. *Description Géographique, Historique et Archéologique de la Palestine* (Paris, 1868-1880), vol. 1:341; Guérin, M.V. *Description Géographique, Historique et Archéologique de la Palestine* (Paris, 1868). The Hebrew edition was translated by H. Ben-Amram (Jerusalem, 1982) vol. 1: 9.

12 Schur, N. *The Book of Travelers to the Holy Land, the 19th century* (Jerusalem, 1988), 290 (Hebrew).

13 Guérin, *Description Géographique*, vol. 6: 228.

aspects of the country. Although the PEF was established as a scientific research foundation, sponsored by the British public, it was run by military officers appointed by the British War Office. Their maps later served the British forces when they conquered Palestine in 1917 and no doubt in the battle between the Turkish and British forces at Jacob's Ford which took place in September 1918:[14]

> *"Kusr 'Atra (R e) (the Crusading castle of Castellet). This is a rectangular castle, measuring 420 feet long by 200 feet wide. It was built on an isolated tell above the River Jordan, and was surrounded on the north and west by a ditch, and on the east and south by the River Jordan. The place is entirely ruined, though traces of the walls can still be distinguished, and some large well-dressed limestone stones are still in position. The majority of the building material was basalt. This castle is mentioned by William of Tyre (Book XXII, Chapters 10, 12), where, describing an expedition made by the king with his army into the country on the other side of Jordan, it is said they came to a position called Chastellet, and from there passed over the Jordan by the Bridge of Jacob. The upper surface of the hill is generally flat, and is surrounded by a rectangular enclosure, which consisted of a thick wall composed of small volcanic stones cased with splendid limestone blocks either completely smoothed or cut in relief. The casing has been three-fourths taken away. A tower flanked each of the angles of this rectangle, and at the centre of each side a gate was constructed, facing one of the four cardinal points. Within this enclosure nothing is to be distinguished in the midst of the bushes except at the northern extremity, at the highest part of the hill, where is remarked a mass of piled-up rubbish, under which some foundations still in place are visible."*[15]

Their account of the Templar fortress at Jacob's Ford does not differ from the early accounts. It mentions the fortress walls, four gates and towers. Regarding the towers, it seems they, too, were describing what they thought lay beneath the surface.

Gottlieb Schumacher (d. 1925), an American engineer of German origin who grew up in the Templar colony in Haifa, conducted a thorough survey of the Golan. His work is still used by many archaeologists today. Unlike the British, who worked in a team, Schumacher did all his field work and research on his own. The Golan Survey was carried out on behalf of the German Survey Foundation of Palestine (*Deutschen Palästina Vereins*, DPV) and completed the survey of the region east of the Jordan River that the British PEF team had not finished.[16] While he marked the fortress on his map, he did not describe the site.

By the early twentieth century, aerial photographs of the country were made by the Turkish, German, British and Australian air forces.[17] The earliest aerial photograph to include our fortress is relatively late and dates to 1945, taken by the British Royal Air Force. The curtain wall of the

14 Tuchman, B. *The Bible and the Sword* (New York, 1956): 239; Schur, *Book of Travelers*, 75,77. The battle is described in Chapter 19 of this volume by Uri Berger and Assaf Peretz.

15 Conder C.R., and Kitchener, H.H. *The Survey of Western Palestine. Memoirs of the Topography, Orography, Hydrography and Archaeology* (London, 1881), vol. 1, Galilee: 250.

16 Ben-Artzi, Y. Unrealized Development Plans for Haifa at the End of the 19th Century. *Cathedra* 73 (1994): 62–65 (Hebrew).

17 Gavish, D. Air-Photographs by First World War Pilots in Eretz–Israel. *Cathedra* (April 1978): 118–150 (Hebrew).

fortress can be traced but there is no sign of towers, posterns, or the main gate (Fig. 2.1).

The above accounts vary from full-scale descriptions of the fortress with all the architectural elements, to just the outline of the curtain walls. It seems many authors used their imagination to complete the plan of the fortress and added a vivid description of what they assumed lay beneath the surface.

**Figure 2.1.** Aerial photograph of the road from Galilee to Damascus crossing the Jordan River at Jacob's Ford. Taken by the British Air force in 1945

CHAPTER 3

# AN ACCOUNT OF A SHORT SEGMENT ALONG THE DAMASCENE-FRANKISH FRONTIER: BANIAS, JACOB'S FORD AND WADI ʿALʿĀL (1105–1178)

This chapter examines the relations between the Franks and the Muslims along a short segment of the eastern frontier, from Banias to the southern edge of the Sea of Galilee (Fig. 3.1), over a period of eighty years, from the conquest of the Galilee by the Franks to the signing of the peace treaty between Ṣalāḥ al-Dīn (Saladin) and Baldwin IV in 1180, following the destruction of the fortress at Jacob's Ford. The decision to build the fortress, its construction and its fall, are viewed here within the broader frame of events, encompassing the number and scale of raids, large open-field battles, sieges and peace treaties, carried out by both the Kingdom of Jerusalem and the Damascenes.[1] The chapter also examines the similarities and differences in the Muslim and Frankish approaches to the management of the struggle and each side's policy towards the construction of fortifications on the frontier. With regard to the actual delineation of this segment, although borderlines and frontiers are often described in the medieval chronicles, there are no Latin or Arabic sources that give a clear-cut description of the eastern boundary of this part of the Kingdom of Jerusalem in the period under discussion. While in some sections there was a well-defined line, in others, during certain decades, the border can only be roughly charted.[2] The clearest description of the Jordan River serving as the border is found in Abū Shāma, who quotes a letter from al-Qāḍī al-Fāḍil, sent to Baghdad, describing Saladin's fierce raid on the region of Baysān in 1183: "…and the servant and those with him, under the eye of God and on His behalf, arrived at the Jordan, a river which separates the Muslim lands from those of the infidel."

وأصبح الخادم واياهم بعين الله في سبيله على ماء الاردن وهو النهر الفاصل بين الاسلام والكفر.[3]

1 For the different types of peace treaties, see Taeko, N. Territorial Disputes between Syrian Cities and the Early Crusaders: The Struggle for Economic and Political Dominance. In Y. Hiroyuki (ed.) *The Concept of Territory in Islamic Law and Thought* (London and New York, 2000), 103.

2 Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007), 118–145; Pringle, D. Castles and Frontiers in the Latin East. In A. Jotischky and K. Stringer (eds.) *Norman Expansion* (London, 2019), 227–239; Brauer, R. W. Boundaries and Frontiers in Medieval Muslim Geography. *Transactions of the American Philosophical Society* New Series 85/6 (1995): 1–8; Lewis, K. J. Shifting Borders in the Latin East: The Case of the County of Tripoli. In M. Sinibaldi, K. J. Lewis, B. Major and J. A. Thompson (eds.) *Crusader Landscape in the Medieval Levant* (Cardiff, 2016), 103–105, 113.

3 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmān b. Ismāʿīl, *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3: 187.


**Figure 3.1.** The three roads that crossed the Golan Heights and led to Damascus via: (1) Banias, (2) Jacob's Ford, and (3) Qaṣr Bardawīl (Wadi ʿAlʿāl), (Map by Shai Scharfberg).

The dearth of written evidence in this case reflects ongoing, complex, regional developments. Taeko has suggested that this segment of the border was purposely obscured due to agreements regarding the sharing of agricultural crops.[4] The frontier between the two political entities stretched along the rough volcanic slopes of the Golan, the fertile Hula Valley with its marshland, the Jordan River, and the Sea of Galilee. The steep banks of the Yarmouk River comprised the southern limit. Further east, within Damascene territories lay the plateau of the Golan, the Bashan, and the fertile land of the Hawran, which played a fundamental role in the political and military decisions made by local rulers.

The north-south roads that cross the Golan and the Hula Valley are regional routes, while the west-east roads from the coast via the Galilee to Damascus are international routes. The locations of fortifications along this segment of the frontier is linked directly to the 'bottleneck' passages on the three roads to Damascus (Map 3.1).[5] The northern route

4 Taeko, Territorial Disputes, 121.

5 Hartal, M. *Northern Golan Heights*: *The Archaeological Survey as a Source of Regional History* (Israel Department of Antiquities and Museums/Ministry of Education and Culture, Qazrin, 1989), 139 (Hebrew with English summary); Smail, R. C. *Crusading Warfare 1097–1193* (Cambridge, 1976), 150; Kennedy, H. *Crusader Castles* (Cambridge, 1994), 207.

was dominated by the town of Banias, the only urban centre along the frontier, located 70 km from Damascus. Its rich and secure sources of water, as well as the nearby fertile agricultural and grazing lands, made Banias a valuable asset. The town frequently changed hands between the Franks and the Muslims, serving each side, in turn, as both a defensive position and as a base from which to launch sorties into enemy territory. Jacob's Ford, approximately 32 km south of Banias, controlled the central road; this route is rarely mentioned in contemporary sources. The most southerly route ran along the eastern perimeter of the Golan. It was along this road that the Franks constructed their first frontier fortress, and it is here that our account begins.

## A play with two actors

The arrival of the First Crusade and the establishment of the Franks in the Galilee received a fairly warm welcome from Damascus. This response can only be understood against the background of the political setting in Syria, which is best described by Köhler as a "highly sensitive network of relationships… the political landscape in Syria towards the end of the eleventh century was shaped by different factors, such as shifting coalitions, the opportunistic loyalties of the local dynasties and confessional communities, as well as the ambitions of tribal leaders and Seljuk commanders to establish their own spheres of rule."[6] Damascus was also carefully watching the military and political developments in the Fatimid state. Duqāq, the Turkish ruler of Damascus (r. 1095–1104), who had seized power shortly before the arrival of the First Crusade, clearly viewed the Crusader Kingdom of Jerusalem as a potential buffer zone between Damascus and the Fatimids in Egypt.[7] Duqāq's tenuous position, forced him to compromise and offer his new neighbours a peace treaty. The Frankish response is described by Albert of Aachen (born c. 1080):

> *"The Turks, indeed seeing that Tancred grew stronger from day to day, and that Duke Godfrey's forces were always there to support him, decided to make peace with him for some time, on this condition: that after the end of the peace they would take council together and they would either be willing to submit to him, or would refuse to enter any treaty with him. Tancred consulted the duke about these things and agreed to the Turks' requests, and, receiving very many gifts of bezants, gold, silver and purple from them and from the Fat Peasant, he disturbed the land with war very little after this. Then after some days had passed, Tancred sent six soldiers, eloquent and very experienced men, to the prince of the Turks at Damascus demanding that he surrender the city to Tancred and adopt the Christian faith."*[8]

The Damascene ruler promptly executed Tancred's eloquent envoy who brought the offer, and the peace treaty was postponed.

---

6 Köhler, M. A. *Alliances and Treaties between Frankish and Muslim Rulers in the Middle East*. Translated by Peter M. Holt, Revised, edited and introduced by Konrad Hirschler (Leiden and Boston, 2013), 9.

7 Morton, N. *The Crusader States and their Neighbours* (Oxford, 2020), 68.

8 Albert of Aachen, *Historia Ierosolimitana*. Ed. and Trans. S. B. Edgington (Oxford, 2007), 511.

The Franks assessed the military and political situation of Damascus and made a quick and decisive move. After raiding the southern territories of Damascus twice, in 1100 and 1105,[9] a year after Duqāq's death (Table 3.1), they invested and built the first Crusader fortress along the eastern frontier. King Baldwin I (d. 1118) penetrated deep into the Golan, as close as he dared to Damascus, and constructed a fortress referred to by Ibn al-Qalānisī as Ḥiṣn ʿAlʿāl. It is better known today and referred to on modern maps as Qaṣr Bardawīl, located on the bank of Wādī ʿAlʿāl, on the narrow pass that commands the southern route to the Hawran, 80 km from Damascus (Fig. 3.1).[10]

According to Ibn al-Qalānisī, the ruler of Damascus did not hesitate:

> *"In this year the Franks marched out to the Sawād of Tiberias and began the construction of the castle of 'Al'āl between the Sawād (the district east of the Sea of Galilee) and al-Bathanīy. It was one of those castles which are described as impregnable. When Ẓahīr al-Dīn atābek learnt of this intention of theirs, he became anxious to prevent its completion, lest once done it should prove difficult to undo. Setting out with the ʿaskar, he marched against them before they became aware of the disaster that threatened them, fell upon them and slew them to the last man. Having obtained possession of the castle, with all the war material, animals and utensils of the Franks that it contained, he returned to Damascus with their heads, and with the Franks he had captured, and an immense quantity of booty taken from them…"*[11]

Tughtakin, according to Ibn al-Athīr, promised five dinars to anyone who brought him a stone from the fortress.[12] The new Frankish fortress was sacked and destroyed before the year had ended. It seems that the Franks had underestimated the enemy and the difficulties of holding a fortress in a remote region. A similar fate awaited Castellum Arnaldi, built by Baldwin I on the road to Jerusalem. It too was sacked in 1106, shortly after it was built.[13] According to Morton, after Tancred had left the kingdom Baldwin I no longer thought of conquering Damascus and was "content to raid the Hawran and expand into Transjordan."[14] Kennedy suggested that Qaṣr Bardawīl was "an attempt to establish a permanent Frankish presence on the Golan Heights and the Hawran, an area that was rich in wine, corn, oil and good pastures."[15] The location of Qaṣr Bardawīl and its size (according to the sources) indicates that it would have allowed the Franks to raid the area with ease, and perhaps serve as a base from which to coordinate the logistics and supplies for an army setting out on a complex campaign. The fortress of al-Habbis Jaldak is often seen as the fort the Franks built to compensate for the loss of Qaṣr Bardawīl. While it may have served as a viewpoint to survey the

9 Albert of Aachen, *Historia Ierosolimitana*, 507–509.

10 Ibn al-Qalānisī, *Ṭārīkh Dimashq* (Damascus, 1983), 241.

11 Ibn al-Qalānisī, *The Damascus Chronicle of the Crusades, extracted and translated from the Chronicle of Ibn al- Qalānisī*. Trans. H.A.R. Gibb (London, 1932), 72. The fortress is not mentioned by William of Tyre.

12 Ibn al-Athīr, ʿIzz al-Dīn ʿAlī, *al-Kāmil fī'l-Ṭārīkh*. Ed. C. J. Tornberg (Beirut, 1987), vol. 9: 89; Ibn al-Athīr, *The Chronicle of Ibn al-Athīr for the Crusading Period from Al-Kāmil fi'l-Ta'rīkh*. Tran. D. S. Richards, (Aldershot, Hampshire, U.K., 2007), vol. 1: 97.

13 Pringle, D. Templar Castles between Jaffa and Jerusalem. In H. Nicholson (ed.) *The Military Orders* (Hampshire, 1998), 103.

14 Morton, *Crusader States*, 26.

15 Kennedy, *Crusader Castles*, 40.

region, it could not protect the road, since it was located on the steep southern gorge of the Yarmouk River, far from the actual pass (Fig. 3.1). Nor could it serve as a base for expeditions raiding Damascus; the cave fortress was small, difficult to access, and could only support a small garrison.[16]

The events of 1105 mirror those that surrounded the construction and fall of Jacob's Ford. The destruction of the fortress at Wādī ʿAlʿāl did not deter the Franks. In 1106 the Hawran, Sawād, and Jabal ʿAwf were raided by a Frankish force from Tiberias. In 1108 the Damascenes raided the region of Tiberias and returned with the king's nephew, who was quickly executed by Tughtakin after he refused to convert to Islam. This round of warfare ended with the signing of a peace treaty (*hudna*) for four years.[17]

An almost identical series of events took place in 1113–1114. The large-scale raid carried out by the Franks into the territory of Damascus, was followed by a Damascene raid into the Galilee. The two armies later clashed at al-Quhwana, west of the bridge of Sannabrā, at the southern edge of the Sea of Galilee, where the Franks were defeated.[18] This intensive round of aggression ended when Baldwin I proposed signing a treaty with Tughtakin:

> *"… an armistice and peaceful relations between them, in order that the provinces might be restored to cultivation after their devastation and the roads be secured from malice of evil-doers and robbers. An agreement was reached between them to this effect, and each of them took an oath to the other to observe faithfully and loyally the terms of the treaty and live in friendship and peace."*[19]

The territories east of the Sea of Galilee were eventually divided between the local farmers, the Muslims, and the Frankish rulers. The Bedouin tribes ended up paying the Franks an annual fee that allowed them to pasture their herds.[20]

**Table 3.1.** Muslim and Frankish Peace Treaties, Sieges and Raids (1100–1118).

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1100 | | Franks raid the Hawran twice. | | Duqāq, ruler of Damascus offers peace. The Franks refuse. |
| 1105 | Tughtakin, ruler of Damascus, destroys the Frankish fort of Qaṣr Bardawīl. | | | |
| 1106 | | The Franks raid the Sawād (region east of the Sea of Galilee), Hawran and Jabal ʿAwf (Gilead). | Franks and Damascenes prepare to meet. The Franks retreat and go back to Tiberias. | |

16 Kennedy, *Crusader Castles*, 52–54.
17 Ibn al-Athīr, *al-Kāmil*, vol. 9: 130 (Tornberg); Ibn al-Qalānisī, *Damascus Chronicle*, 74–75, 86.
18 Ibn al-Qalānisī, *Damascus Chronicle*, 135.
19 Ibn al-Qalānisī, *Damascus Chronicle*, 147.
20 Ibn al-Qalānisī, *Damascus Chronicle*, 92; Prawer, J. *A History of the Latin Kingdom of Jerusalem* (Jerusalem, 1963), vol. 1: 167–168, 213; Holt, P. M. *The Crusader States and Their Neighbours: 1098–1291* (London, 2004), 38; Taeko, Territorial Disputes, 114.

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1108 | | Tughtakin raids the region of Tiberias. | | Treaty between Damascus and Jerusalem for 4 years that includes sharing agricultural yields. |
| 1110 | | Baldwin I raids southern Lebanon. | | The peace treaty with Damascus is renewed. |
| 1113 | | Baldwin raids the Damascus district of Bathaniyya; food in Damascus depleted and food prices rise. Major Muslim raid throughout Galilee. | Battle at al-Quhwana west of the bridge of Ṣannabrā. The Franks are defeated. | An agreement between Tughtakin and Baldwin I guarantees public security on the main roads. |

Baldwin II (r. 1118–1131) was determined to extend Frankish territories further east and annex the rich grain fields of the Hawran.[21] Possession of the Hawran would ensure the Franks' grain supply, secure its regional independence, and remove its reliance on southern European wheat in times of dearth. It would also enable the Franks to achieve their political and military goals by negotiating and paying with grain. Frankish warfare in Syria, according to Smail, was not driven by "zeal for Holy War, or thoughts of personal enrichment, or the needs of trade… above all land was required as a material basis of government … function of government still largely depended on the extent of their landed possessions."[22] Holt pursues a similar line: "What was at stake in hostilities was security of territory — the control of strategic points that gave safety and viability to tracts of land."[23] Phillips, on the other hand, emphasizes the kingdom's defensive needs: "The campaign against Damascus was of considerable significance for the security of the Holy Land."[24]

Baldwin II's efforts went beyond those of his predecessor, alternating between raids, long sieges, and open field battles (Table 3.2). The Damascenes remained alert and retaliated, but seldom initiated attacks. In 1121, Tughtakin signed an alliance with a group of local tribesmen and raided the region of Tiberias. By the time the king had gathered his forces, the Muslim army had returned to the safety of their own lands.[25] The Damascenes raided the kingdom once again in 1123.[26] Two years later (1125), the Franks raided the region of Damascus.[27] The following year (1126) the entire army marched to Damascus. According to Ibn al-Qalānisī, Frankish forces were preparing to plunder and devastate

21 Ibn al-Qalānisī, *Damascus Chronicle*, 291, refers to the custom of transporting grain from the Hawran to Damascus by the local tribes. In the late 19th century, surplus wheat from the Hawran was exported to Egypt, Greece, and Western Europe. Issawi, C. *The Fertile Crescent 1800–1914* (Oxford, 1998), 272, 311.

22 Smail, *Crusading Warfare*, 23.

23 Holt, *Neighbours*, 40.

24 Phillips, J. Hugh of Payns and the 1129 Damascus Crusade. In M. Barber (ed.) *The Military Orders* (London, 1994), 142.

25 William Archbishop of Tyre, *The Deeds Done Beyond the Sea*. Trans. E. A. Babcock and A. C. Krey (New York, 1976), vol. 2: 18–19.

26 Fulcher of Chartres, *Historia Hierosolymitana (1095–1127)*. Ed. H. Hagenmeyer (Heidelberg, 1913), 643–645, 689–690.

27 William of Tyre, vol. 2: 538. He does not give their names.

the Hawran. The two armies eventually met and although the Muslims forces were defeated, the Frankish camp was ransacked by the Turkmans, who did not join the retreating Muslim army. The Frankish infantry, left at the camp, was slain. Thus, the king had no choice but to leave the battlefield.[28]

Tughtakin's death (1128) prompted Baldwin II to besiege Damascus again in 1129. The capture of Banias by the Franks a year earlier no doubt encouraged him.[29] The Frankish host numbered 60,000 men,[30] mainly infantry and a strong cavalry of 2000 knights. The men were recruited from the Kingdom of Jerusalem, its two neighbouring principalities, and a European force that had just arrived in the Levant.[31] The new Damascene ruler, Tāj al-Mulūk Būrī (r. 1128–1132), hastily recruited Turkmans from the region, offering the tribesmen money, grain, food for the men, and fodder for the horses. The Franks arrived, set up camp near the city, and waited. The Muslim forces attacked the Frankish supply caravan and returned to Damascus laden with booty and captives. The Franks retreated after learning what befell their men and supplies.[32]

Although Baldwin II increased the scale and frequency of his assaults on Damascus, correcting and improving his military campaigns after each failure, even when the size of his army was significantly enlarged, the Franks were unable to capture either the city or its surrounding agricultural land. The local Turkman tribesmen manoeuvred swiftly in the difficult terrain, which was well known to them, and their light horsemen often dealt decisive blows. In most cases, they were easily recruited, if offered money or grain.

**Table 3.2.** Muslim and Frankish Peace Treaties, Sieges and Raids (1118–1131).

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1118 | | Muslims raid Tiberias and its surroundings. | | Peace treaty between Damascus and Jerusalem. |
| 1119 | | Franks gain control along the banks of the Yarmouk. | | |
| 1120 | | Tughtakin raids Tiberias together with the one of the local tribes. | | |
| 1123 | | Damascenes raid the Kingdom of Jerusalem. | | |
| 1126 | Baldwin II sets out to conquer Damascus. | Hawran raided by Baldwin II. | Damascene and Frankish forces meet outside Damascus. | |
| 1129 | Baldwin besieges Damascus using Banias as his base. | | | |

28 Ibn al-Qalānisī, *Damascus Chronicle*, 175–176; Ibn al-Athīr, *al-Kāmil* (Richards), vol. 1: 265–266; Phillips, Damascus Crusade, 142; William of Tyre, vol. 2: 40–43.

29 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 236, 250–251.

30 A number that seems vastly inflated.

31 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 1: 278.

32 Ibn al-Qalānisī, *Damascus Chronicle*, 197–198; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 251.

## A play with three actors

While the Franks did not altogether abandon the idea of expanding their territories, King Fulk (r. 1132–1143) had to adapt his policy along the eastern frontier to the political changes that the region was undergoing (Table 3.3). The most significant event during this period was the loss of Banias. The town was captured by the Damascenes at the end of 1132, after a fierce and well-planned siege.[33] In 1134 the Franks raided the Hawran.[34] The Muslims quickly retaliated and raided the Galilee, reaching Tiberias, Acre, and Nazareth: "When the Franks reached their lands, they saw it in ruins. Greatly reduced in strength, they disbanded and sent envoys to discuss a renewal of the truce."[35] The 1134 truce was broken by a single raid carried out in 1138 by the Franks in the region of Banias; by the time the Muslim force arrived, the Franks were back in the safety of their own lands.

The entry of a third party, Imad al-Din Zengi (d. 1146), into the political arena drove all three leaders (King Fulk, Zengi and Muʿīn al-Dīn Ünür, the ruler of Damascus, r. 1138–1149) to sign, shift and sever alliances at an incredible pace. The Damascenes, who were geographically wedged between Fulk and Zengi, showed remarkable diplomatic talent.

Zengi's attempt to conquer Damascus twice during 1140[36] forced the Kingdom of Jerusalem and Damascus to form an alliance. Damascus was now seen by the Franks as a buffer state,[37] whose fragile independence relied both on its ruler's shrewdness and Frankish military aid. The Kingdom's interests changed accordingly. Whenever called upon, King Fulk sent his army to assist in Damascus's defence. William of Tyre describes the situation in one short phrase: "a cruel enemy, equally dangerous to both kingdoms."[38] Zengi raided the farming region between them.[39] Muʿīn al-Dīn Ünür, ruler of Damascus, offered to pay his old enemy/new ally "twenty thousand pieces of gold per month for the necessary expenses of the enterprise."[40] The Damascenes also agreed to help bring Banias back under Frankish rule. In 1140, when the Muslim governor of Banias drew up an agreement with Zengi, Jerusalem and Damascus combined their armies and besieged the town. It eventually capitulated and was returned to the Franks, as agreed.[41] The fortified town of Banias with its rich agricultural hinterland became the strongest Frankish post along the eastern frontier,[42] a close and convenient base from which the Franks could assist Damascus,[43] or raid its surroundings.

---

33 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 268; William of Tyre, vol. 2: 74. Benvenisti, M. *The Crusaders in the Holy Land* (Jerusalem, 1976), 148.

34 Ibn al-Qalānisī, *Damascus Chronicle*, 216–217, 226.

35 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 1: 305; Ibn al-Athīr, *al-Kāmil* (Tornberg), 9, 130. William refers to this truce, William of Tyre, vol. 2: 76.

36 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 313.

37 Greenfield Partem, M. The Buffer System in International Relations. *Journal of Conflict Resolution* (March 1983), 19, 21; Chay, J. and Ross T. E. *Buffer States in World Politics* (Boulder and London, 1986), 1–7.

38 William of Tyre, vol. 2: 105.

39 Taeko, Territorial Disputes 120.

40 William of Tyre, vol. 2: 106–110.

41 Ibn al-Qalānisī, *Damascus Chronicle*, 275; William of Tyre, vol. 2: 105–106; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 313–314.

42 Benvenisti, *Holy Land*, 302; Ellenblum, *Crusader Castles*, 231–233.

43 Benvenisti, *Holy Land*, 149–150.

The following seven years, however, were the longest period of calm during these decades. All three sides held their forces at bay.

Zengi's murder in 1146 shuffled regional affairs, and in 1147, the two former rivals, Aleppo and Damascus, signed their first alliance, to consolidate the alliance Ünür married his daughter to Nūr al-Dīn Maḥmūd, Zengi's heir.[44] The new alliance between the two Muslim entities was perceived by Baldwin III (r. 1143–1163) as a threat.[45]

Following the arrival of the Second Crusade, the Franks set out via Banias to conquer Damascus. This was the third and last Frankish attempt to conquer this Syrian city;[46] the campaign lasted four days.[47]

The familiar regional state of raids and counter-raids returned and dominated the years 1149–1151. Ünür made the most of the Christian failure to take Damascus, launching raids on both the Kingdom of Jerusalem and the County of Tripoli.[48] The renewal of the peace agreement between Jerusalem and Damascus (1149) and the continuous payments of tribute by Damascus to the Franks,[49] suggests the balance of power still tilted in favour of the Franks.[50]

Ünür's death in August 1149 triggered a chain of events: while the Franks raided the Hawran, Nūr al-Dīn quickly set up camp there, and in 1150–1151 he launched three attacks on Damascus. Damascus, still determined to hold on to its independence, used every possible diplomatic avenue to secure its position. Its ruler called upon the Franks for help and eventually managed to settle an agreement and sign a peace treaty with Nūr al-Dīn.[51]

In 1153 the Kingdom's eastern frontier was abandoned in order to defend Ascalon. While Baldwin III was occupied in the south,[52] Nūr al-Dīn conquered Banias and Damascus. Under Nūr al-Dīn (r. 1154–1174), Damascus regained its status as a capital, a title it had not held since the Umayyad period.[53] In the meantime, however, Nūr al-Dīn continued paying tribute to the Franks, and a peace treaty was concluded with the Kingdom of Jerusalem in 1155.[54] Affairs along the frontier were back to being steered by two rulers.

---

44 Ibn al-Qalānisī, *Damascus Chronicle*, 259–261; William of Tyre, vol. 2: 148.

45 Hoch M. The price of failure: the Second Crusade as a turning-point in the history of the Latin East? In J. Phillips and M. Hoch (eds.) *The Second Crusade* (Manchester and New York, 2001),182.

46 On the developments of events that led to the change in the goals of the Crusade see Phillips, J. *The Second Crusade: Extending the Frontiers of Christendom* (Yale University Press, 2007), 213–227.

47 Riley-Smith, J. *The Crusades; A Short History* (London, 1990), 102; Hoch, N. The Choice of Damascus as the Objective of the Second Crusade: A Re-evaluation. In M. Balard (ed.) *Au tour de la première Croisade. Actes du Colloque de la* Society for the Study of the Crusades and the Latin East *(Clermont-Ferrand, 22–25 juin 1995)* Byzantina Sorbonensia, vol. 14; Paris: Publications de la Sorbonne (1996), 359–369; Hoch, The price of failure,182–183.

48 Ibn al-Qalānisī, *Damascus Chronicle*, 289–290.

49 Hoch, The price of failure,188.

50 Taeko, Territorial Disputes, 106.

51 Ibn al-Qalānisī, *Damascus Chronicle*, 295–299; Gibb, H.A.R. The Career of Nūr al-Dīn. In K. M. Setton (ed.) *A History of the Crusades* (University of Pennsylvania, 1955), 517–518.

52 Pringle, D. The Survey of the Walls of Ashkelon. In T. Hoffman *Ashkelon* 8: *The Islamic and Crusader Periods* (University Park, Pennsylvania, 2019), 106–107.

53 Chamberlain, M. *Knowledge and Social Practice in Medieval Damascus, 1190–1350* (Cambridge, 1994), 37; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 398.

54 Ibn al-Qalānisī, *Damascus Chronicle*, 322; Prawer, *Latin Kingdom of Jerusalem*, vol. 1:327; Gibb, The Career of Nūr al-Dīn, 520.

The peace treaty, that was extended for yet another year, was broken in 1157 when a chain of violent earthquakes caused severe damage in Nūr al-Dīn's lands.[55] Baldwin III took advantage of the wreckage caused throughout Syria and together with the forces of the two principalities, he set out against Nūr al-Dīn. He later attacked and pillaged the Turkman tribes' large herds that grazed near Banias, though they had paid the king a pasture tax.[56] The raid was followed by an ambush carried out by Nuṣrat al-Dīn, Nūr al-Dīn's brother, on a Hospitallers' supply caravan, making its way to Banias. Nuṣrat al-Dīn's success led Nūr al-Dīn to besiege Banias; the Frankish garrison held its ground until reinforcements arrived. The king stayed in order to supervise the repairs and ensure the garrison was fit and well supplied. Nūr al-Dīn remained in the region and ambushed King Baldwin's forces near the spring of ʿEinan in the Hula Valley. The king barely escaped and fled to Safed. Nūr al-Dīn returned to Banias, hoping to take the town before the Franks recovered. The king, however, managed to recruit a large army from Acre, forcing Nūr al-Dīn to withdraw.[57]

The struggle over Banias led the constable, Humphrey II of Toron, to seek help from the brothers of the Hospital.[58] According to William of Tyre, he "became weary of the continual responsibility and expense which devolved upon him in the care of the city of Banias…" The devastating raid on the Hospitallers' caravan changed their initial decision and Banias was left to cope and defend itself as best as it could.[59]

King Baldwin III, still confident his forces could match those of his new foe, marched his army up the Golan towards Damascus (1158). Nūr al-Dīn was forced to evacuate Habbis Jaldak, the small Frankish cave fortress on the Yarmouk River that he had taken a few months earlier. The two armies eventually clashed north of the Sea of Galilee in the Batiha Valley, where the Muslims were defeated.[60] A sum of 4000 gold pieces and a three month truce was initiated in 1160 by Damascus.[61] When the agreement expired, Baldwin set out to raid Damascus: "He drove off cattle and slaves, burned and plundered without hindrance … laid waste the land, destroyed the surrounding fields, and took inhabitants captive."[62]

Although the 1160s saw both armies investing their funds and manpower in marching back and forth to Egypt, the fighting along the north-eastern frontier continued. The ensuing decade saw a gradual erosion of the Frankish strength. "Nūr al-Dīn had demonstrated that without reinforcement the Franks' frontier castles could not withstand Muslim sieges."[63] The numerical advantage of the Muslims allowed Nūr al-Dīn to fight on both the southern and the northern fronts. In 1164 he besieged Banias;

55 Ibn al-Qalānisī, *Damascus Chronicle*, 322; Prawer, *Latin Kingdom of Jerusalem*, vol. 1:315; Gibb, The Career of Nūr al-Dīn, 520.
56 Ibn al-Qalānisī, *Damascus Chronicle*, 327–328; William of Tyre, vol. 2: 255–256.
57 William of Tyre, vol. 2: 256–264; Ibn al-Qalānisī, *Damascus Chronicle*, 327–338; Benvenisti, *Holy Land*, 150–151.
58 William of Tyre, vol. 2: 256.
59 Abdelkawy Sheir, A.M.M. The Military Role of the Fief of Tibnīn against the Muslims in the Age of the Crusades (AH 498–583/ AD 1105–1187) *Journal of Religious Culture* 188 (2014): 12–13; Abū Shāma, *Kitāb al-rawḍatayn*, vol. 1:107.
60 William of Tyre, vol. 2: 272–273.
61 Najm al-Dīn was nominated by Nūr al-Dīn while the latter was campaigning.
62 William of Tyre, vol. 2: 282–283.
63 Ellenblum, *Crusader Castles*, 233.

the town was captured and remained under Muslim rule henceforth.[64] The Frankish fortress at Chastel Neuf (Hunīn) in the upper Galilee fell three years later (1167) but was not occupied by the Muslims.[65] While the king was not actively involved in the building and maintenance of the eastern frontier fortresses, he formed a clear and uncompromising policy against those who surrendered them. In 1166 twelve Templar knights were executed after the king learned that their garrison had surrendered a fortress beyond the Jordan River. Amalric was on his way to aid the besieged fortress when the decision was taken. A similar end befell the commander of the cave of Tyre, who was caught and hanged after the fortress was taken by the Muslims. Threats and punishments were made after Nūr al-Dīn took Banias, but none of the commanders were put to death.[66]

Nūr al-Dīn's entrenchment in Damascus and Banias left the kingdom's north-eastern frontier in a vulnerable position. For a while, however, peaceful solutions were found, and agricultural and grazing lands were shared equally between the two sides.[67]

After five successive campaigns against Egypt, King Amalric (r. 1163–1174) acknowledged defeat. By 1171 Nūr al-Dīn was formally in control of Egypt, the largest grain basket in the eastern Mediterranean; in addition to enlarging his stocks of grain, his source of manpower had also grown substantially.[68]

Although Nur al-Din's power had grown, he was still aware of the Frankish military strength. Ibn al-Athīr conveys the fear and urgency that filled the Syrian ruler as he surveyed the poor state of his fortifications that were badly damaged in the 1171 earthquake.[69] This is one of the few contemporary accounts that provides a clear sense of the tension and delicate state of affairs along the frontier, as it was seen from both the Muslim and the Christian perspective.

> *"When Nūr al-Dīn received the news, he went to Baalbek to repair the damage to its wall and citadel. When, however, the news from the rest of the towns came to him, news of the destruction of their walls and citadels and their abandonment by the inhabitants he placed men in Baalbek to repair, protect and guard it and went to Homs, where he did the same, and then to Hama and then to Barʿin. He was extremely wary of the danger for the towns from the Franks. Then he came to Aleppo, where he saw effects of the earthquake greater than elsewhere, for it had destroyed it utterly and the survivors were totally terror stricken. They were unable to shelter in their houses for fear of aftershocks. They remained in the open. Nūr al-Dīn personally took part in the repair work and so continued until he had rebuilt its walls and mosques … As for the Frankish territory, the earthquake tremors also had the same effect there. They were kept busy repairing their towns, fearful of Nūr al-Dīn*

64 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 9: 469.
65 Shaqed, I. Margaliot Fortress. *Excavations and Surveys in Israel* 104 (1995): 16–17; William of Tyre, vol. 2: 308–310.
66 William of Tyre, vol. 2: 310, 312.
67 Ibn Jubayr in Benvenisti, *Holy Land*, 151.
68 Eddé, A.-M., *Saladin.* Trans. J. M. Todd (Cambridge and London, 2011), 105.
69 Guidoboni, E., Bernardini, F. Comastri, A. and Boschi, E. The large earthquake on 29 June 1170 (Syria, Lebanon, and central southern Turkey). *Journal of Geophysical Research* 109 B7 (2004).

*for them. Each side was occupied with repair work for fear of the other."*[70]

In order to ensure that no side would make a move against its foe, an official treaty was signed.[71] The 1170 truce was an emergency policy, necessary to allow each side to recover. The disaster, however, was not strong enough to change military concepts or political ideologies. William of Tyre clearly states this was to be a short-term agreement;[72] once the fortifications were in order, their storerooms stocked, and garrisons re-established and armed, the truce would not hold. In 1171 Nūr al-Dīn launched an attack on the Galilee from his base in Banias. The assault failed and his army was scattered by the Franks who camped in Sephoris.[73] A year later the Franks invaded the Hawran, the Muslim forces chased them out and ended up raiding Tiberias and its surroundings, returning to Damascus laden with booty.[74] On learning of Nūr al-Dīn's death (May 1174), King Amalric hurriedly set out and besieged Banias, aiming to push back the frontier and regain control of the rich agricultural lands. The Franks eventually raised the siege and left Banias, after Nūr al-Dīn's widow paid them generously.[75]

**Table 3.3.** Muslim and Frankish Peace Treaties, Sieges and Raids (1132–1174).

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1132 | Banias conquered by the ruler of Damascus. | | | |
| 1134 | | Franks raid the Hawran,[76] Muslims raid Galilee. | | Truce between Fulk and Ünür ruler of Damascus, is renewed. |
| 1137 | | Ruler of Damascus raids Nablus, pillages and burns the region. | | |
| 1139 | Zengi besieges Damascus. | | | |
| 1140 | King Fulk and Muʿīn al-Dīn Ünür join forces against Zengi and capture Banias. The town is returned to the Franks. | | | Ruler of Banias signs an alliance with Zengi. Treaty between Ünür and King Fulk. |
| 1147 | Baldwin III sets out to conquer the Hawran — the campaign fails. | | | Ünür marries his daughters to Nūr al-Dīn and to a high ranking Frankish knight. |
| 1148 | What's left of the armies of the Second Crusade and the Kingdom of Jerusalem besiege Damascus. | | | Treaty between ruler of Damascus and King Baldwin III is renewed. |

70 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 2: 186; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 11: 373–374.
71 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 2: 200.
72 William of Tyre, vol. 2: 371.
73 William of Tyre, vol. 2: 382.
74 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 10: 45.
75 William of Tyre, vol. 2: 394; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 10: 60.
76 Ibn al-Qalānisī, *Damascus Chronicle*, 216–217, 226.

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1149 | | Ünür and local Bedouins raid the Kingdom's territories using the Hawran their base.<br>Ünür's death is followed by Frankish raids into the Hawran. | | Treaty between ruler of Damascus and King Baldwin III is renewed. |
| 1150 | Nūr al-Dīn attempts twice to conquer Damascus. | Turkmans attack Banias, Damascus assists the Franks and drives them away. | | Following Nūr al-Dīn's attempt to conquer Damascus, Jerusalem and Damascus sign a peace treaty. |
| 1151 | Nūr al-Dīn besieges Damascus. | | | |
| 1153 | Nūr al-Dīn besieges Banias. | | | |
| 1154 | Nūr al-Dīn besieges Damascus; the city capitulates. | | | |
| 1155 | | | | Treaty signed between Nūr al-Dīn and Baldwin III. |
| 1156 | | | | Treaty between Nūr al-Dīn and Baldwin III extended for another year. |
| 1157 | Nūr al-Dīn besieges Banias . | Baldwin III pillages nomadic herds near Banias.<br>Nuṣrat al-Dīn ambushes Frankish caravan. | | |
| 1158 | Baldwin III marches towards Damascus. | | Frankish and Muslim armies meet north of the Sea of Galilee. | |
| 1160 | | Baldwin III conducts a vast raid south of Damascus, burning and pillaging the entire region, taking cattle and captives. | | 3-month truce offered by the substitute ruler of Damascus to Baldwin III, who agrees and is given an additional sum of 4000 gold pieces. |
| 1164 | Nūr al-Dīn besieges Banias. The town falls and remains under Muslim control until the end of the Crusader period. | | | |
| 1167 | | Nūr al-Dīn sacks the fortress of Hunīn. | | |
| 1170 | | | | Truce signed between Nūr al-Dīn and the Frankish principalities after devastating earthquake. |
| 1171 | | Nūr al-Dīn launches an attack on the Galilee; his army is scattered by the Franks camped in Sephoris. | | |

| YEAR | SIEGES | RAIDS | OPEN FIELD BATTLES | PEACE TREATIES |
|---|---|---|---|---|
| 1172 | | The Franks invade the Hawran, the Muslim forces chase them out and end up raiding Tiberias. | | |
| 1174 | King Amalric besieges Banias after learning of Nūr al-Dīn's death. He leaves only after Nūr al-Dīn's widow pays him. | | | |
| October 1174 | | Saladin marches into Damascus, the city surrenders. | | |

## The eastern frontier on the eve of the construction of the castle at Jacob's Ford

The most important question regarding the last decade of this survey is — what had changed? What led the Franks to build the fortress at Jacob's Ford? The Franks' reaction to Saladin's occupation of Damascus is revealed in William of Tyre's account:

> *"So our chief men had great reason to fear that when Saladin had doubled his possessions and had increased his empire twofold he would by this strength rise against the kingdom with greater force and harass us more violently than ever. In spite of all our efforts, however, all attempts to restrain him have been in vain, … our apprehensions have been realized. For so powerfully has he risen against us by land and by sea…"*[77]

When Saladin marched into Damascus (October 1174), his most pressing concern was the submission of the central and northern Syrian cities.[78] The Franks, as on former occasions, took advantage of this phase of transition, and set out to raid the neighbouring territories, aiming to retrieve land they had lost. Saladin's occupation of Damascus coincided with King Baldwin IV's (r. 1174–1185) ascent to the throne. The king's first move was a large-scale raid on the hinterland of Damascus (1175). The objective was to create a diversion and draw Saladin's besieging forces from Aleppo, which had allied with the Franks against Saladin. The nature of the alliance was similar to that between the Kingdom of Jerusalem and Damascus in the 1130s. The Franks torched the granaries, as well as the grain left in the fields. They continued for several days and returned home laden with booty. A second raid, on a larger scale, was carried out in the summer of 1176; the king was joined by Raymond of Tripoli. The amount of booty carried back by the Franks was said to have been vast.[79]

77 William of Tyre, vol. 2: 404–405.

78 Ehrenkreutz, A. S. *Saladin* (New York, 1972), 126–140; Phillips, J. *The Life and Legend of the Sultan Saladin* (New Haven and London, 2019), 106–108.

79 William of Tyre, vol. 2: 411–413.

**Figure 3.2.** Jacob's Ford, a fortress with no natural defences.

The Frankish victory at the battle of Montgisard (1177), located between Ramlah and Yibnah, is often noted and emphasized as a booster to Frankish military morale capitalized by Baldwin IV, leading to the decision to build the fortress at Jacob's Ford.[80] Viewing the result of the battle from the Muslim angle, it seems Saladin and his military entourage realized that any attack on the Kingdom of Jerusalem should be carried out from Damascus, a route that was far shorter and safer than coming from Cairo. This change may well have led the Franks to focus on the eastern frontier.

When the decision to construct the fortress at Jacob's Ford was made, none of the passes along the three main routes that connected the Galilee and Damascus were held by the Franks. The raids near Banias in April and June 1179[81] were, according to Benvenisti, a further attempt to bring the town back under Frankish control.[82] The intensive raiding along the frontier and the building of the fortress at Jacob's Ford can be interpreted either as signs of panic or as a demonstration of power meant to convey a message to the new ruler in Damascus.

ʿImād al-Dīn (quoted by Abū Shāma) expressed his concern in a discussion with Saladin, after the Templar plan to fortify the Ford was revealed to the Muslims: "When they complete this fortress, we will lose control over the Muslim frontier. And he [the Sultan] said: If they complete this fortress, we shall raze it to the ground."[83]A fortress with

80 Ellenblum, *Crusader Castles*, 261; Asbridge, T. *The Crusades* (London, 2010), 310; Phillips, *Saladin*, 121–123.
81 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 19–20.
82 Benvenisti, *Holy Land*, 151.
83 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 19.

a strong garrison could serve as a base for a large army that would threaten Damascus and its livelihood. Much later, al-Maqrīzī (d. 1442) adds that Jacob's Ford would provide the Franks command of the agricultural hinterland of Banias, the granary of Damascus.[84] Securing the pass at Jacob's Ford by building a fortress directly on the riverbank would allow the Franks to maintain a firm footing on the frontier, to raid the district of Banias and that of Damascus, and perhaps to seize the opportunity to bring Banias back under Frankish rule.

The fortress at Jacob's Ford (Fig. 3.1) was built on a low tell, on the western bank of the Jordan River, half-way between the Hula Valley and the Sea of Galilee, c. 90 km from Damascus. South of the ford the river runs in a steep canyon, while north of the ford lay the swamps of the Hula Valley, both difficult to cross with large caravans or military forces. At the ford, the river is narrow and shallow and can be crossed throughout the year. The building of the fortress was a huge undertaking and expenditure. It is a site with no natural defences, exposed on all sides, in an area that appears to have had few settlements.

The only fortresses that existed along this segment of the frontier at this point were: (1) Safed, acquired by the Templars a decade earlier; (2) Hunīn, located between Safed and Beaufort (Qalʿat Shaqīf), partially burnt in 1167 and abandoned after Nūr al-Dīn had conquered it; and (3) Beaufort, owned by the lord of Sidon and located on the bank of the Litani River (Fig. 3.1).[85] Unlike Baldwin I, who had ventured into the Golan and constructed Qaṣr Bardawīl, Baldwin IV built the fortress at Jacob's Ford as close as possible to the modest centres of Frankish power — Safed (15 km west of the ford), which was then a fairly small fortress, and Tiberias (43 km south of the ford). Although none of the sources describe a plan to fortify the frontier, Hamilton suggested that "the Franks spent the summer of 1178 strengthening the defences of their kingdom."[86] The reconstruction of Hunīn (Chastel Neuf)[87] was carried out by Humphrey II of Toron during the same year that the king decided to build Jacob's Ford. Humphrey was wounded during the raid on Banias and died at his new fortress in April 1179.

The construction of the castle at Jacob's Ford was to be a joint venture, led by the king and the Templars. By the mid-twelfth century the nobility had begun to sell its rural fortifications due to the growing cost of maintaining them and the damage caused to agricultural property by raiding.[88] There were, however, voices within the military orders who opposed the idea of buying and resettling fortresses. In 1170 the Hospitaller Master, Gilbert of Assailly, was asked to "amend his conduct in office, namely that he would no longer accept castles and fortresses in frontier regions…"[89] He refused. In 1178 the Templars held six rural castles

84 al-Maqrīzī, Taqī al-Dīn Aḥmad b. ʿAli. *Kitāb al-sulūk li-maʿrifat duwal al-mulūk.* M. M. Ziyāda and S.ʿA. F. Āshūr (eds.) (Cairo, 1934–1973), vol. 1 part 1, 66.

85 Barbé, H. and Damati, E. Le château de Safed: sources historiques, problématique et premiers résultats des recherches. In N. Faucherre, J. Mesqui et N. Prouteau (eds.) *La fortification au temps des croisades. Actes du colloque de Parthenay* (Rennes, 2004), 77–93; Kennedy, *Crusader Castles*, 42–43; 128–129.

86 Smail, *Crusading Warfare*, 208; Hamilton, B. *The Leper King and His Heirs* (Cambridge, 2000), 141.

87 The fortress was taken and destroyed in 1167 by Nūr al-Dīn.

88 Barber, M. Supplying the Crusader States: The Role of the Templars. In B. Z. Kedar (ed.) *The Horns of Hattin* (Jerusalem, 1992), 315.

89 Burgtorf, J. *The Central Convent of Hospitallers and Templars* (Leiden and Boston, 2008), 68.

in the Kingdom of Jerusalem: Castellum Arnaldi, Maldoim (Qalʿat al-Damm), La Féve, the tower at Le Destroit (a small, fortified tower near ʻAtlit), La Toron des Chevaliers (Latrun), and Safed. According to Barber, the Templars "were entrusted with the guard of vital castles in the Latin East, through which they were beginning to evolve an overall strategy of frontier defence."[90] Barber continues to explain part of the motivation behind the Order's work:

> *"Just as the Hospitallers needed to astonish visiting pilgrims with the sight of their huge 'palaces of the sick' at Jerusalem and Acre, so too did the Templars need to convince their fellow Christians that they were fulfilling the ideals upon which they were founded and for which they had been given their wealth. In fact, much of their military advice and activity in the east was characterized by a rather conservative assessment of the military and strategic situations. But caution was not good propaganda."*[91]

Although the Templars were an independent military body with their own financial sources, their activities within the borders of the Kingdom of Jerusalem were restricted. Military movements that were not coordinated with and approved by the king received a severe response.[92]

Whether there was a grand plan to fortify the eastern frontier, or each of the above bodies acted independently, a permanent presence was needed to mark their territories.[93] If Jacob's Ford had been completed, there would have been three fortresses (Hunīn, Safed and Beaufort) along the Naftali and Ramim mountain range, a stretch of 41 km as the crow flies.

According to Boas, frontier castles were no more than isolated fortified forward positions which could house large garrisons, contain stores of weapons, food and equipment, and serve as look-out points and refuge.[94] Ellenblum surveyed, analysed and compared the theories and conclusions of nineteenth- and twentieth-century studies as well as contemporary Frankish sources regarding the role of Crusader fortresses. He divided and mapped three generations of Frankish fortresses. Jacob's Ford belonged to the third group, that dated to 1168–1187: "In the third period, Frankish military superiority began to decline while Muslim forces began to threaten the fringes of the kingdom and, in time, to endanger its very existence. It was during this period that the Franks built new huge castles which incorporated innovative military technologies."[95] Jacob's Ford, according to Ellenblum, was meant to protect the frontier.

The numerous raids conducted by the Franks into southern Syria throughout the 1170s (Table 3.4) were clearly part of the effort to retrieve Banias and/or form a new military base from which they could launch attacks and raid the region of Damascus. A comment made by a contemporary source, sixty-three years after the destruction of Jacob's Ford, when the fortress of Safed was rebuilt (1241), sheds further light on the kingdom's policy.

---

90 Barber, M. The Knights Templars. *Historian* 60 (Winter 1998), 5.
91 Barber, Knights Templars, 6.
92 Forey, A. *The Military Orders* (Toronto and Buffalo, 1992), 52.
93 Forey, *Military Orders*, 58.
94 Boas, A. J. *Archaeology of the Military Orders* (London and New York, 2006), 103.
95 Ellenblum, *Crusader Castles*, 187. See also Ellenblum, R. Frankish Castles in The Crusader Kingdom of Jerusalem, the Third Generation. In M. Balard (ed.) *Le Concile de Clermont et la Prémiere Croisade* (Paris, 1996), 518–551.

According to the anonymous author, who describes Safed's construction: "It [Safed] would be a formidably strong base offering ease and opportunities for launching attacks and forays into Saracen territory as far as Damascus … There existed no other fortress in that land from which so much damage could be inflicted on the Saracens."[96] It seems Jacob's Ford was to function in a similar manner; it was constructed first and foremost as a base from which to raid the territories of Damascus and the Hawran.[97] If raiding was a form of defence, then perhaps Jacob's Ford was meant to protect the kingdom's eastern frontier.

**Table 3.4.** Frankish and Muslim Raids and Other Campaigns in the 1170s.

| YEAR | SIEGES | RAIDS | PEACE TREATIES |
|---|---|---|---|
| 1170 | | | Truce signed between Nūr al-Dīn and the Frankish principalities after devastating earthquake. |
| 1171 | | Nūr al-Dīn launches an attack on the Galilee; his army is scattered by the Franks camped in Sephoris. | |
| 1172 | | The Frank invade the Hawran, the Muslim forces chase them away and end up raiding Tiberias.[98] | |
| 1174 | King Amalric besieges Banias after learning of Nūr al-Dīn's death. He leaves only after Nūr al-Dīn's widow pays him. | | |
| October 1174 | | Saladin marches into Damascus, after the city surrenders. | |
| 1175 | | Baldwin IV torches the Damascus hinterland, its grain fields, and granaries. | |
| 1176 | | Baldwin IV and Raymond of Tripoli plunder Saladin's territories and return with a vast amount of booty. | |
| September 1178 | | Franks raid Hama and the villages around it. Hama's garrison defeats them and recover the booty. | |
| October 1178 | | The Franks start constructing the fortress at Jacob's Ford. | |
| 1178 | | Saladin sends Bedouin forces from Banias to pillage the Galilee, Sidon, and Beirut. | |

96 The Anonymous Author, De constructione castri Saphet. In *The Templars*. *Selected sources translated and annotated by M. Barber and K. Bate* (Manchester, 2002), 86.

97 A similar suggestion was raised by Phillips, *The Life and Legend of the Sultan,* 124.

98 Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 10: 45.

| YEAR | SIEGES | RAIDS | PEACE TREATIES |
|---|---|---|---|
| Spring 1179 | | Baldwin IV raids the large herds near Banias. Reinforcements arrive from Damascus and the Frankish force is defeated at Marj ʿAyyūn. | |
| April 1179 | Saladin's first attempt to besiege the fortress at Jacob's Ford. | | Saladin offers to buy the fortress from the Templars. |
| May 1179 | | Saladin sets up his base at Tall al-Qāḍī (Tel Dan), attacks both Hunīn and the fortress at Jacob's Ford and fails to conquer them. He plunders the wheat fields west of Sidon and Beirut, and burns what they leave behind them. | |
| June 1179 | | Frankish forces retaliate, but are defeated, and retreat to Sidon and the fortress at Beaufort; 250 men are captured, and many are killed. Saladin's forces destroy the crops and orchards east of Sidon and Beirut. | |
| August 1179 | | Saladin's second siege of Jacob's Ford; the fortress falls. | |
| 1180 | | | Baldwin IV sues for peace; Saladin agrees. |

## 1178–1181, the longest of the twelfth century droughts and the construction of the Fortress at Jacob's Ford

The building of the fortress began when the truce with Saladin was still in effect, and during one of the harshest and longest droughts Syria experienced in the second half of the twelfth century. The 1178–1179 drought affected most of the eastern Mediterranean, stretching across Syria, Iraq, the Jazira (Upper Mesopotamia), Egypt and North Africa.[99] According to William of Tyre, the drought lasted five consecutive years in Damascus and its surrounding region.[100] All the expected upheavals caused by drought were recorded: food shortages and high prices, famine, sickness, high death tolls and migration.[101] The Mediterranean coast, which is less prone to droughts, is not mentioned in any of the sources that describe this drought, and it may have received its regular annual amount of rain. Thus, large areas within the Kingdom of Jerusalem and Frankish principalities along the coast were probably spared. The only hint of food shortages in the Kingdom of Jerusalem comes from a series

99 Abū Shāma, *Kitāb al-rawḍatayn,* vol. 3:21; al-Maqrīzī, *Kitāb al-Sulūk* vol. 1. part 1:71–72; Ibn al-Athīr, *al-Kāmil* (Tornberg), vol. 11: 451–452.

100 William of Tyre, vol. 2: 446–447.

101 Ibn al-Athīr, *al-Kāmil,* 2: 261–262 (Richards).

of documents that tell of a shipment of wheat from southern Italy to Acre.[102]

The severity of the drought had a direct impact on the ongoing Muslim-Frankish engagements along the north-eastern frontier: it led to a sharp rise in both tensions, and the scale and frequency of violent raids. The Franks exploited the situation, assuming Saladin would calculate his moves carefully, due to the crisis inflicted on Syria because of the drought. Viewing Frankish and Muslim relations against the background of this long drought provides a better understanding of the events.

Although the level of aggression rose, one of Saladin's first moves was to reduce his forces in Syria. The risk of losing a large part of his army through famine and disease no doubt prompted this decision:

"…The sultan sent his brother Tūrānshāh [along with part of the army] from Syria to Egypt because of the weakness of his army due to the drought in the country."[103]

In October 1178 Baldwin IV's entire army arrived at Jacob's Ford, and the construction began. The army guarded the site and assisted in its building.[104] The Muslims, who were closely watching the development of the site, knew that it was a long way from being finished.[105] Shortly afterwards Saladin moved his forces closer. Leaving the safety of Damascus and Banias, he set up his base at Tall al-Qāḍī (Tel Dan), 4 km west of Banias and 32 km north of Jacob's Ford, and sent his army to raid the territories.[106]

It seems that even at this early stage, the fortress served as a base for launching attacks on Muslim territories. In April 1179, while the fortress was being built, Baldwin IV, tempted by the large herds grazing the nearby pastures of Banias, set out on a well-planned raid, expecting to return with a large number of livestock. The herds belonged to the nomadic tribes searching for food, water and pasture. Up until the early twentieth century, herds from eastern Syria periodically came west in search of grazing lands. The surroundings of Banias no doubt seemed lush and plentiful in comparison to the drought-stricken regions of Syria.

> *"… News reached the king (Baldwin IV) that the enemy in search of pasture had incautiously led their flocks and herds into the forest near Banias. They were without fighting men on whom they might count to repel any attack made by us."*[107]

The attack was repelled by a contingent from Damascus commanded by ʿIzz al-Dīn Farrukshāh, Saladin's nephew. The battle was fought at Marj ʿAyyūn, where the Franks suffered severe losses. The king barely escaped with his life. The Master of the Templars and the Master of the Hospitallers were captured, together with many other prisoners.[108] At the end of the spring of 1179, Saladin invaded the land of Sidon. According to Lyons and Jackson, Saladin was faced with a problem when the Bedouins arrived to receive their yearly allotment of grain. Saladin did not want to alienate them or exhaust his own supplies. He tried to resolve the problem

---

102 Abulafia, D. *The Two Italies, Economic Relations between the Roman Kingdom of Sicily and the Northern Communes* (Cambridge, 1977), 147–148.
103 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 19, 21.
104 Ellenblum, *Crusader Castles*, 260–265.
105 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:21; Ibn al-Athīr, *al-Kāmil* (Richards), vol. 2:264.
106 Abū Shāma, quoting Ibn Abī Ṭayy, *Kitāb al-rawḍatayn*, vol. 3:34; William of Tyre, vol. 2: 440
107 William of Tyre, vol. 2:438–439.
108 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 2: 264.

by sending them to raid the land of Sidon and Beirut.[109] Saladin attempted to break the cycle of violence in early April, when he suggested buying the still unfinished fortress of Jacob's Ford from the Templars. While this seems a peculiar move, solving military affairs by paying the enemy was not an unusual Muslim practice. It was however, rarely used by the Franks, who may have been too poor or too proud. In 1174 King Amalric was paid by Nūr al-Dīn's widow to lift his siege on Banias, and in 1177 al-Malik al-Ṣāliḥ offered the Frankish armies besieging Ḥarim a generous sum if they raised their siege.[110] In both the above cases the Franks accepted payment.

*"And the Sultan had generously offered them [the Franks] sixty thousand dinars so they would demolish it [the fortress at Jacob's Ford], but they did not do so, he pressed them until he reached a hundred thousand, they refused."*

وقد كان السلطان بذل لهم في هدمه ستين الف دينارفلم يفعلو فزاردهم حتى بلغ مئه الف فابوا.[111]

Ibn Abī Ṭayy is the only source that claims the Templars were willing to accept Saladin's offer, if he would have paid all their expenses. This suggests the sum of 100,000 dinars did not fully cover the entire cost of the building.[112] Baldwin IV and the Templars did not negotiate for a higher sum or request the release of prisoners. They rejected the two offers and ended this short session of diplomacy. The sultan's council was against the campaign, arguing that:

*"The people were suffering from the drought and the drought was widespread. The sultan was told: this is not the year to wage jihad. If they ask you for safety, grant it, and if they lean towards peace, follow it."*[113]

Following the failure of the negotiations, Saladin turned to his council and opposition and said: "God has ordered jihad, and He will guarantee success."[114] Saladin attacked the fortress at Jacob's Ford in May 1179, after the king had departed with his army, leaving the fortress in the hands of the Templars. Aware of the fact he might find himself trapped between the garrison and reinforcements, Saladin decided to raise the siege after five days. The Templars did not expect Saladin to return. In June, the king's forces, assisted by Raymond of Tripoli and the Knights Templars, attacked Saladin's camp at Tall al-Qāḍī (Tel Dan). The Franks were defeated. The remaining force retreated to Sidon and the fortress at Beaufort; two hundred and fifty men were captured and many were killed.[115] A further report by Ibn Wāṣil (d.1298) describes Saladin's raids on crops and herds between Sidon and Beirut. The raids were meant to ease the food shortage in Damascus.

*"He [the Sultan] camped at Tall al-Qāḍī and acted from the camp that bordered the enemy's land. He rode every day into Sidon and raided*

109 Lyons, M.C. and Jackson, D.E.P. *Saladin: The Politics of Holy War* (Cambridge, 1982), 138.
110 Ibn al-Athīr, *al-Kāmil* (Richards), vol. 2: 256. For more details of payoffs, see Fulton, M. S. *Siege Warfare during the Crusades* (South Yorkshire and Philadelphia, 2019), 254–256.
111 Abū Shāma, *Kitāb al-rawḍatayn* vol. 3: 37.
112 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003), 89.
113 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 19.
114 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 19.
115 William of Tyre, vol. 2: 442–443.

*the region. The army and the Bedouin tribes raided Sidon and Beirut and harvested the enemy's crops. What they took they loaded on their camels and animals of burden until little remained [in the fields]."*[116]

William of Tyre gives a similar but more aggressive description:

*"He [Saladin] burnt all the crops, those that had been gathered into the granaries, those still stacked in the fields, and the growing grain as well. He drove off the cattle … and lay waste the whole country in every direction."*[117]

The raid forced the count of Tripoli to sign a peace treaty with Saladin.[118]

In August 1179, Saladin set out once again for Jacob's Ford. The site and its topography, the size and make-up of the garrison and the work force, were well known to him. He came well prepared. The Franks were caught by surprise; the finds throughout the excavation indicate that they were not expecting Saladin to return. Tools were found where the men were still working, round a pile of mortar they were mixing, and in front of the main gate. The fortress fell at the end of August 1179. Evidence of the battle that took place could be seen all across the site. Hundreds of arrowheads were scattered inside the fortress and along the outer walls. Skeletons of wounded men, mules, horses, and pigs were found, attesting to fighting at close quarters. The destruction of the fortress and Baldwin's failure in all five encounters between October 1178 and August 1179 left the king no choice but to sue for peace.

## Summary

I have not managed to answer all the questions listed in the introduction to this chapter. The survey of affairs along the frontier shows two parallel tracks that continued up to the destruction of the fortress at Jacob's Ford. The diplomacy track is marked by sixteen peace treaties of various types, some of which were maintained for several years and often extended and renewed. The agreement to share agricultural yields with Damascus, for example, continued until 1187. A second, militant track (Table 3.5) marks bilateral raids (13 Frankish, 15 Muslim), a few sieges (five), and even fewer large-scale open field battles (four). The survey also illustrates the Franks' need to control one or more of the three main routes between Damascus and the kingdom's northern regions, preferably Banias with its rich agricultural hinterland. The role of the frontier fortifications in the defence of the kingdom is not at all apparent unless we assume that raids across the border played a central part in the military dialogue and strategic positioning in the neighbourhood. The town of Banias and the fortress built at Wādī ʿAlʿāl were to serve mainly as Frankish bases for launching sorties on Damascus and its environs. The fortress at Jacob's Ford would have been a formidable base, one that could accommodate a permanent large force and serve as a station for an army on its way to fight in southern Syria. It could also serve a retreating force that needed shelter after an unsuccessful campaign. Why had

116 Ibn Wāṣil, *Mufarrij al-kurūb fī akhbār banī ayyūb*. Ed. G. al-Dīn al-Shayyāl (Cairo, 1957), vol. 2: 73–74.
117 William of Tyre, vol. 2: 448.
118 William of Tyre, vol. 2: 449.

the Franks not secured the ford at an earlier stage? There could be several answers to this question: The road seems to have passed through a region that was sparsely settled. But mostly it was a difficult and expensive outlay, due to the site's topography that offered little protection. It also had no immediate agricultural hinterland.[119] It required logistics and military manpower that the Templars could not field on their own, and funding on a scale that the king could not provide. It was only after the Franks had failed to retrieve Banias, and following the establishment of Saladin in Damascus, that their choice fell upon Jacob's Ford.

It is interesting to compare the fortifications along the frontier between the Kingdom of Jerusalem and Damascus to the Mamluk-Mongol frontier in the late thirteenth century. Although the scale and resources of the Mongol Empire and Mamluk Sultanate were by far greater, the main purpose of the fortresses constructed on the Euphrates by the sultan Baybars (r. 1260–1277) was to alert the Mamluk army of a Mongol invasion. While the Mamluks carried out raids across the border into Mongol territories, they never aimed to conquer and annex land east of the Euphrates.[120] The three fortified fords along the Euphrates were maintained throughout the Mamluk period and were continuously backed up by reinforcements from the central Syrian cities. If the situation was dire, a large army was sent from Cairo. Most of the Mongol campaigns ended at the frontier. Returning to the time and geography this chapter is concerned with, the strategy of the Damascene rulers before 1154, and that of Nūr al-Dīn and Saladin, was similar to that of the Mamluks. Banias was regarded as key to the safety of the Muslim capital and territories. The town's rich agricultural lands and fortification were a bonus, as it did not have to rely on Damascus for food supplies. Its advantage as a Muslim frontier town was due to its proximity to Damascus. Fortifying the two other routes — at Jacob's Ford and Wādī ʿAlʿāl — was never part of the Muslim military strategy. Damascus was close enough to both. They thus focused on Banias, and quickly and efficiently snuffed out every Frankish attempt to construct fortresses that threatened their capital and its prized agricultural lands. While the Hawran had fortified towers with small Muslim garrisons,[121] the only fortress the Damascenes would build along this segment of the frontier would be Qalʿat al-Ṣubayba (1228), above Banias to the east.[122] If the Muslims needed a closer military base, they established a temporary camp, as Saladin had done at Tall al-Qāḍī.

The fortress at Jacob's Ford was the Franks' last attempt to control the main roads and to build a fortress directly on the frontier.

Territorial expansion dictated Frankish strategy and policy during the Kingdom's early decades. As long as there was only a single weaker or equal opponent involved the Franks pursued an expansionist policy vigorously. None of the Frankish attempts to conquer land east of the frontier succeeded and the only long-term profit gained in

119 Ellenblum, Frontier Activities, 92–93.

120 Amitai-Preiss, R. *Mongols and Mamluks: The Mamluk–Ilkhanid War 1260–1281* (Cambridge, 1995), 106, 202–213. Raids across the border were carried out by both sides.

121 William of Tyre, vol. 2: 29–30.

122 Ellenblum, R. Who built Qalat al-Subayba? *Dumbarton Oaks Papers* 43 (1989):103–112; Amitai, R. Notes on the Ayyubid Inscriptions at Al-Ṣubayba (Qalʿat Nimrod), *Dumbarton Oaks Papers* 43 (1989),113–119; Hartal, M. *The Al-Ṣubayba (Nimrod) Fortress, Towers 11 and 9,* IAA Reports 11 (Jerusalem, 2001).

this struggle was either through the tribute paid by Damascus or when peaceful agreements were reached, and crops were shared. As shown by Taeko, treaties were frequently signed and renewed, and many lasted for a substantial time. His findings also suggest there were more agreements than are found in the sources.[123]

While Frankish policy changed, and the conquest of land east of the frontier was no longer a feasible goal, raiding continued in much the same manner as before. The numerous raids initiated and carried out by both the Christian and the Muslim forces led by kings, sultans, nobility, and high ranking amirs, were the most prominent and intriguing part of the warfare carried out along the frontiers.

**Table 3.5.** Sieges, Raids and Peace Treaties Between 1174 and 1180.

| | YEAR | SIEGES | RAIDS | PEACE TREATIES |
|---|---|---|---|---|
| 1 | October 1174 | | Damascus surrenders to Saladin. | |
| 2 | 1175 | | Baldwin IV torches Damascus's grain fields and granaries. | |
| 3 | 1176 | | Baldwin IV and Raymond of Tripoli plunder Saladin's territories and return with a vast amount of booty. | |
| 4 | 1178 September | | Franks raid Hama and villages around it. Hama's garrison defeats them and recover the booty. | |
| 5 | 1178 October Construction of the fortress at Jacob's Ford begins | | | |
| 6 | 1178 | | Saladin sends Bedouins from Banias to pillage the Galilee, Sidon, and Beirut. | |
| 7 | 1179 Spring | | Baldwin IV raids herds near Banias. Reinforcements arrive from Damascus; the Franks are defeated at Marj ʿAyyūn. | |
| 8 | 1179 April | | | Saladin offers to buy the fortress from the Templars. |
| 9 | 1179 May | Saladin sets up his base at Tall al-Qāḍī (Tel Dan); first assault on the fortress at Jacob's Ford. | Saladin's forces plunder wheat fields east of Sidon and Beirut, and burn what they leave behind them. | |
| 10 | 1179 June | | Frankish forces retaliate, but are defeated and retreat to Sidon and Beaufort: 250 men are captured, many are killed. Saladin's forces destroy crops and orchards east of Sidon and Beirut. | |
| 11 | 1179 August | Saladin's second siege on Jacob's Ford; the fortress falls. | | |
| 12 | 1180 | | | Baldwin IV sues for peace, Saladin agrees and a treaty is signed. |

123 Taeko, Territorial Disputes, 111.

Contrary to Prawer's assumption,[124] the intensive raids into Muslim territories had several important achievements. Raiding served to demonstrate one's strength; striking against economic targets undermined enemies' power and authority, and, if successful, it was a quick means of profiting.[125] William of Tyre describes Baldwin III's financial difficulties before he raided the Turkman herds at Banias (1157):

> "*The king, burdened by debt and held fast by many obligations which he had no means of satisfying, easily inclined to this as to any scheme by which he might relieve pressure upon him… It is said that the number of captives and the amount of booty taken in this raid was never equalled in our land A very large number of horses was distributed by lot, and in this division every individual even those of the lowest rank shared.*"[126]

Burning grain fields, granaries and orchards threatened the population's food sources, livelihood, hampered its economy and weakened the enemy army. Raiding also helped form and strengthen strategic alliances with other bodies within the kingdom and with new European leaders, who arrived with their own hosts and joined the Franks for short periods.[127] In general, raiding neither aims at nor results in total defeat of the opposing military force or in control of its land, despite the offensive nature of the operations. According to Shamir and Inbar, in these types of conflict there are no formal or ceremonial acts of surrender, no victory pictures and no imposition of peace terms. Victory within the framework of a raiding strategy is more elusive.[128]

The use of raids by both sides was meant to curb the foe. The same strategy was employed after the 1148 attempt to conquer Damascus. It maintained the status quo along the frontier.[129] Matters continued in much the same manner after Saladin established himself in Damascus (1174), and after the Franks' failed attempt to construct the fortress at Jacob's Ford. According to Inbar and Shamir: "In the absence of diplomatic and economic leverage, the aim is limiting the actor's ability to harm others."[130] It seems the fortresses along this segment of the frontier protected the kingdom by forming a secure base from which the Franks could launch their raids into Muslim territory. They often took advantage of temporary weaknesses in the Muslim lands, be it an earthquake that destroyed the enemy's fortifications, the death of a leader that destabilized the region until an heir was found, or a drought. The different Muslim political entities that ruled Damascus employed a similar strategy, using the urban centres as their base. This allowed them to manage without individual rural forts and without incurring the expense involved in building and maintaining them.

---

124 Prawer, *Latin Kingdom of Jerusalem*, vol. 1, 441.

125 Mallet, A. A Trip down the Red Sea with Reynald of Châtillon. *Journal of the Royal Asiatic Society* Third Series, vol. 18/2 (2008): 142; Forey, *Military Orders*, 48.

126 William of Tyre, vol. 2: 255–256.

127 Glowacki, L., Wilson, M. and Wrangham, R. The Evolutionary Anthropology of War. *Journal of Economic Behaviour and Organization* 178 (2017): 973.

128 Inbar, E. and Shamir, E. What after counter-insurgency? Raiding in zones of turmoil. *International Affairs* 92 (6) (2016): 1432.

129 Holt, *Neighbours*, 13.

130 Inbar and Shamir, Raiding in Zones of Turmoil, footnote 5.

## Years of calm (?) and years of turmoil

The Kingdom of Jerusalem experienced relatively long periods of peace, and some regions were more secure than others.[131] The fourteen treaties suggest that the frontier witnessed periods when it was safe to trade, farm, and graze herds. Friedman's research shows that the initiative often came from the Muslims. The eastern frontier, however, was rarely free of Frankish and Muslim military violence. The seven years between 1140–1147 were unique in that this was the only continuous period of calm. The peace treaty signed in 1180 following the destruction of the fortress at Jacob's Ford was somewhat unusual. It was, according to Friedman, one of the first times the Franks sued for peace. William of Tyre, in a dramatic tone, marked this treaty as humiliating, indicating that Saladin had gained a military advantage that the Franks could no longer ignore[132]

> *"A truce in both land and sea, for foreigners and natives alike, was accordingly arranged, confirmed by an exchange of oaths … The conditions were somewhat humiliating to us, for the truce was concluded on equal terms, with no reservations of importance on our part, a thing which is said never to have happened before."*[133]

The lack of security is manifested first and foremost in the small number and poor distribution of villages along the frontier. Despite its three key roads, the Golan appears to have been sparsely settled from the 12th through the 13th century. Its rural population gradually grew after the Golan came under centralized Mamluk rule in the year 1260. The survey carried out by Hartal and Ben Ephraim has mapped 191 Mamluk sites (villages, hamlets, and nomadic sites).[134] A bridge and a khan (caravanserai) were constructed at Jacob's Ford, and the site itself had a hamlet. The local pilgrimage site of Bayt al-Aḥzān ('the House of Sorrow') was restored following the 1202 earthquake. New caravanserais were built along the route to Damascus, suggesting it was well travelled and a major road between the Galilee, where Safed became the provincial capital, and Damascus, the second Mamluk capital.

131 Ellenblum, *Crusader Castles*, 151–160; Morton, *Crusader States*, 111.

132 Friedman, Y. Peacemaking: Perceptions and Practices in the Medieval Latin East. *Crusades* (2010): 234.

133 William of Tyre, vol. 2: 447.

134 The archaeological survey and publication on the Mamluk Golan was conducted by an Israel Antiquities Authority (IAA) team headed by M. Hartal and Y. Ben-Ephraim (2015). Their survey places the Mamluk period as the third most densely settled period, after the Byzantine and late Roman periods. See also: Hartal, M. Archaeological Survey as a Source for the History of the Golan. *Qadmoniot* 148 (2014): 80–89; and Hartal, M. and Ben Ephraim, Y. *The Israeli Antiquity Survey of the Golan: A General Introduction to the Survey of the Golan* (2015, Hebrew) http://survey.antiquities.org.il/#/Golan. For more detailed information, see individual maps. It is important to emphasize the cautious note written by the surveyors, who stated that their diagnosis of the pottery may well be problematic. A preliminary medieval numismatic study of the Golan (carried out by Prof. Haim Ben-David and Dr. Michael Osband from Kinneret College) supports Hartal's conclusion regarding the low number of 12th-13th century villages in the Golan.

CHAPTER 4

# THE CONSTRUCTION OF THE TEMPLAR FORTRESS

## Introduction[1]

The evolution of military architecture in the period under discussion was based on a continuous dialogue between siege warfare and methods of defence used by garrisons within the fortress.[2] This dialogue, that at times could best be defined as the Frankish–Muslim arms race, kept both sides alert and focused for nearly two centuries. It was a remarkable theatre, because the two armies were using almost identical methods of siege warfare,[3] and because at this particular point in time, only one side — the Franks — invested in rural military architecture on a grand scale. While Muslim towns displayed some of the most advanced fortifications, the Ayyubids seldom invested in frontier fortresses.[4] Crusader castles captured by the Muslims along the eastern segment of the frontier were rarely rebuilt and manned. It seems the Ayyubids ran their military campaigns by using a mobile army based in Damascus, aided by the nomadic Turkmen tribes and the Muslim garrison at Banias.

Finances play a key role in military architecture. The development and advance of fortresses would no doubt have come to a standstill had the necessary funding depended solely on the king's treasury or local resources. The wealth of the Templars, which was largely based on a complex European financial network, allowed them to finance the construction of fortresses, recruit and equip large garrisons, and adapt and renovate their fortifications whenever needed.[5] The maintenance of large

1 I would like to thank Professor Denys Pringle of the School of History and Archaeology, Cardiff University, and Professor Adrian Boas of the Department of Archaeology, Haifa University, for reading the draft, and for their helpful suggestions and comments.

2 Kennedy, H. *Crusader Castles* (Cambridge, 1994), 98; Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007), 189; Chevedden, P. E. Fortifications and the Development of Defensive Planning during the Crusader Period. In D. J. Kagay and L.J.A. Villalon (eds.) *The Circle of War in the Middle Ages* (Woodbridge, U.K., 1999), 34. The Hungarian scholar Erik Fugedi reached a very different conclusion while researching fortresses of the first half of the thirteenth century in Hungary. According to Fugedi, "innovations in castle building during the thirteenth century were not triggered by advances in military technology, but rather by social development, enhanced by the Mongol invasion of Hungary in 1241." See Fugedi, E. *Castles and Society in Medieval Hungary (1000–1437)* (Budapest, 1986), 42. Those fortresses later withstood the Mongol invasion of Europe in 1241.

3 According to Köhler, "the Crusaders possessed no new political or military qualities in the eyes of Oriental contemporaries." See Köhler, M. A. *Alliances and Treaties between Frankish and Muslim Rulers in the Middle East*. Translated by P. M. Holt, Revised, edited, and introduced by K. Hirschler (Leiden and Boston, 2013), 9.

4 Raphael, K. *Muslim Fortresses in the Levant* (London and New York, 2011), 7–8.

5 Boas, J. A. *Archaeology of the Military Orders* (London and New York, 2006), 99–100.

castles required, according to Pringle, "more than the domain lands immediately surrounding it."[6] This point is of particular significance when examining the case of Jacob's Ford, which had no prominent agricultural hinterland.

The purchase of fortifications from the lay nobility in the late twelfth and early thirteenth century, and the vast investment of both the Templars and the Hospitallers, propelled the field of military architecture. The period witnessed the construction of large complex structures that scarcely resembled the early forts.[7] Challenges and difficulties presented by both nature and the enemy were overcome thanks to the large sums made available by the military orders, creative engineers, and skilled craftsmen.[8]

By 1178 the kingdom's military forces had laid numerous sieges, and their fortresses had been raided, besieged, sacked, and rebuilt. The military experience gathered in the field was used to improve their fortifications. The Franks were acutely aware of the need to change and strengthen the composition of their garrisons, and the structure of their fortresses. However, while this experience was carefully applied in the plan and methods of construction, the problem of providing large and rapid relief forces was never properly addressed or solved by the Franks.[9]

Challenging and interesting discussions regarding the type of fortress we were excavating were held by the team and between Professor Ellenblum and his colleagues. The following pages will present various debates, difficulties, and hypotheses. Clear-cut answers were not always found and many question marks are inserted throughout this chapter.

## Topographical and geographical advantages and drawbacks

> *"If the castles occupied or built by the Syrian Franks are considered as a whole, the predominant feature of the majority is not the embodiment of a sophisticated theory of fortifications, but the reinforcement of strength already provided by nature. The best defence was inaccessibility, and this was provided by cliff and ravine more effectively than by wall and fosse."*[10]

The archaeological tel on the west bank of the Jordan River (Fig. 4.1) upon which the fortress was constructed, had a longer and more formidable list of drawbacks than advantages. In contrast to most Crusader castles, its location did not provide natural defences. No cliffs, steep mountain slopes or deep ravines protected it. It had no view or command of its immediate surroundings or the road and ford it controlled. The tel was easily accessible from every direction (Fig. 4.2). An enemy force stationed on the slope east of the fortress had a bird's eye view of the entire castle. The fort's plan and construction methods had to compensate for the lack of natural defences. In addition, the site's immediate

6 Pringle, D. Templar Castles between Jaffa and Jerusalem. In H. Nicholson (ed.) *The Military Orders* (Aldershot, Hants, 1998), 109.
7 Ellenblum, R. Frankish Castles in The Crusader Kingdom of Jerusalem, the Third Generation. In M. Balard (ed.) *Le Concile de Clermont et la Prémiere Croisade* (Paris, 1996), 518–551.
8 Forey, A. *The Military Orders* (Toronto and Buffalo, 1992), 98.
9 In contrast to the Franks, the frontier according to Mamluk theory and practice depended first and foremost on the size and training of the relief forces. See Amitai-Preiss, R. *Mongols and Mamluks: The Mamluk–Ilkhanid War 1260–1281* (Cambridge, 1995), 203–205.
10 Smail, R. C. *Crusading Warfare 1097–1193* (Cambridge, 1976), 217.

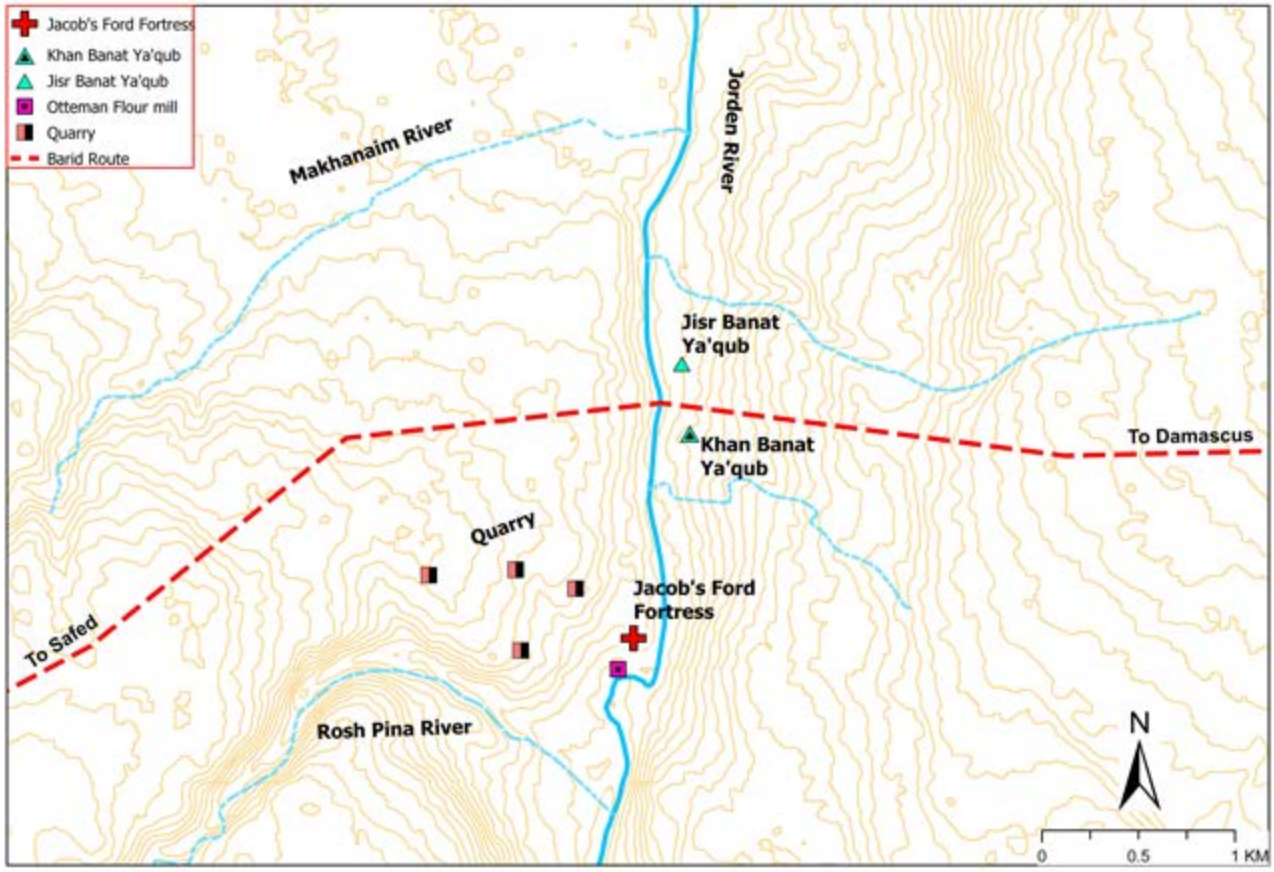



**Figure 4.1.** The Templar fortress at Jacob's Ford and its immediate surroundings (prepared by Shai Scharfberg).

**Figure 4.2.** The fortress at Jacob's Ford (photo: Itai Hinch SAR Unit Me'voot Ha'hermon).

surroundings were difficult to cultivate. The rugged volcanic slopes of the Golan to its east and the steep limestone slopes further down the river on its west are still largely used for grazing. The marsh land of the Hula Valley, north of the fortress, was not suitable for agriculture, and may well have been a source of malaria-carrying mosquitoes. Current archaeological surveys suggest this segment of the frontier was sparsely settled during most of the Crusader period.[11]

The decision makers among the high-ranking members of the Templars, including the architect and the engineer, were no doubt aware of all the site's weaknesses. An examination of the plan and the methods used in its construction reveal the efforts invested to overcome the difficulties and challenges the site posed. Unlike many other Frankish fortresses, the fortress at Jacob's Ford had no earlier Frankish phase. The Hellenistic, Iron and Bronze Age walls were not incorporated in the new fortress. There were no walls that dictated or constrained its design. It was an entirely new construction on a site that had very few advantages.

## The quarries: the pros and cons of local building materials

Fortresses, in most cases, were constructed from local materials. The stone was quarried as close as possible to the building site, reducing the time and cost of transportation. At al-Ṣubayba and Mt. Tabor, both Muslim Ayyubid fortresses, the site itself served as a quarry. The stones for the construction of Jacob's Ford were quarried from a moderate slope approximately 0.5 km west of the tel (Fig. 4.1).

The quarry was surveyed by Yosef Stepansky on behalf of the Israel Antiquities Authority (the survey map was published in the early 1990s).[12] Stones that were partially hewn, but not detached from the bedrock, can still be seen. The surface resembled a large chocolate bar with a chequered net of narrow channels that framed the stone blocks (Fig. 4.3). Troughs and tethering loops for tying draught animals waiting to be loaded were found across the quarries. Among the finds recovered by Stepansky's survey team were four large, heavy iron wedges or stakes used for quarrying (Fig. 4.4). It seems, however, that stones must also have been transported from more distant areas, for the number of open quarries on the hill could not have supplied the amount of stone used for the construction of the fortress.

The local chalk of the Gadot formation, from which the fortress is built, is found along the southwestern edge of the Hula valley; the layer is approximately 2 m thick and stretches in narrow strips across an area of 20 square kilometres (Fig. 4.5). Because the chalk is porous and soft, the blocks of stone used for building were hewn from the hard upper crust of the chalk, called *nari*. The use of *nari* can be seen in buildings constructed in the second millennium BCE at Tel Hazor, the Byzantine synagogue at Yesod ha-Maʿala and the nineteenth and twentieth century houses at Rosh Pina

11 Moshe Hartal, Archaeological Survey as a Source for the History of the Golan, *Qadmoniot* 148 (2014): 80–89; Moshe Hartal and Yigal Ben Ephraim, The IAA Archaeological Survey of the Golan. אתר הסקר הארכיאולוגי של ישראל (antiquities.org.il). Regarding the large tracts of land that surrounded the fortresses of the military orders, see Boas, *Military Orders*, 101.

12 Stepansky, Y. The Archaeological Survey of Israel, IAA, Rosh Pina, Map 18, site 140. http://survey.antiquities.org.il/index_Eng.html#/MapSurvey/2/site/478. The tools were found by M. Cohen, a volunteer from Kibbutz Gadot, who was part of the survey team.

and Yesod ha-Ma'ala. Quarries from all periods are located south and east of Kibbutz Ayelet ha-Shahar. Although the *nari* is harder than the chalk below it, it is still regarded as a relatively soft stone. Hewing and dressing the building blocks was thus made easier, and their weight was considerably lighter, in comparison to the local basalt rock east of the fortress. Its porosity provides the buildings with good insulation properties, but if used for building water cisterns, the walls had to be plastered.[13] A considerable disadvantage is that with "exposure to fire, however, it cannot bear, but splits and cracks to pieces at once."[14]

We found no fine chips of stone in the fortress, indicating that both the coarse and finer masonry work was probably carried out at the quarries. Crusader masonry is mostly defined by thin fine-combed diagonal lines infrequently employed in fortification walls, but often found in gates, posterns, arrow slit frames, installations, and buildings inside the fortress.[15] Stones with mason's marks can be seen all along the curtain wall.[16] Smooth ashlars and marginal drafted blocks with a large boss were used to face the internal side of the curtain walls. The outer face was more uniform, constructed of margin-drafted blocks with a large boss, thus reducing the time spent on dressing the stone, and providing additional protection against stone projectiles hurled from siege machines. At Arsuf

**Figure 4.3.** Quarries west of the fortress.

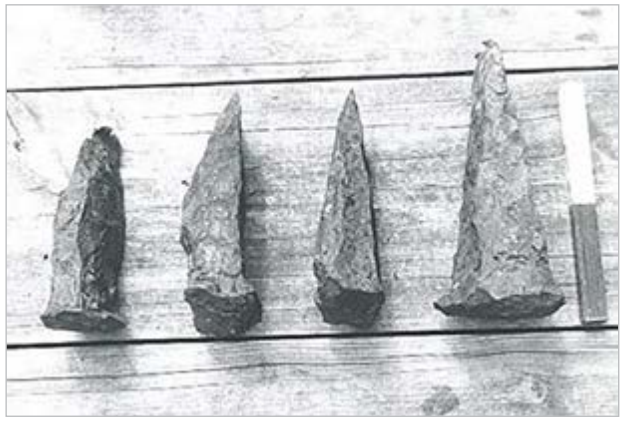


**Figure 4.4.** Four iron stakes found during Stepansky's survey.

13 Ellenblum, R., Marco, S., Agnon, A., Rockwell, T. and Boas, A. Crusader Castle Torn Apart by Earthquake at Dawn, 20 May 1202. *Geology* 26 (1998): 303–306; Ilani, S. and Minster, T. *Gadot Formation Building Stones in the Hula Valley, A One-Thousand-Year-Old Tradition*. The Geological Survey of Israel. Report No. GSI/17/2009 (Jerusalem, October, 2009): 1–10, 1–2.

14 Vitruvius, *The Ten Books on Architecture.* Trans. M. H. Morgan (Cambridge, Mass. and London, 1926), 49–50.

15 Khamisy, R. G. Chapter 13: Masonry and Mason's Marks. In J. A. Boas and R. G. Khamisy (eds.) *Montfort* (Leiden and Boston, 2017), 150–159.

16 Pringle, D. Some Approaches to the Study of Crusader Masonry Marks in Palestine. *Levant* 13 (1981), 104–117; Ellenblum, R. Construction Methods in Frankish Rural Settlements. In B. Z. Kedar (ed.) *The Horns of Hattin* (Jerusalem, 1992), 168–189; Boas, *Military Orders*, 184–189.

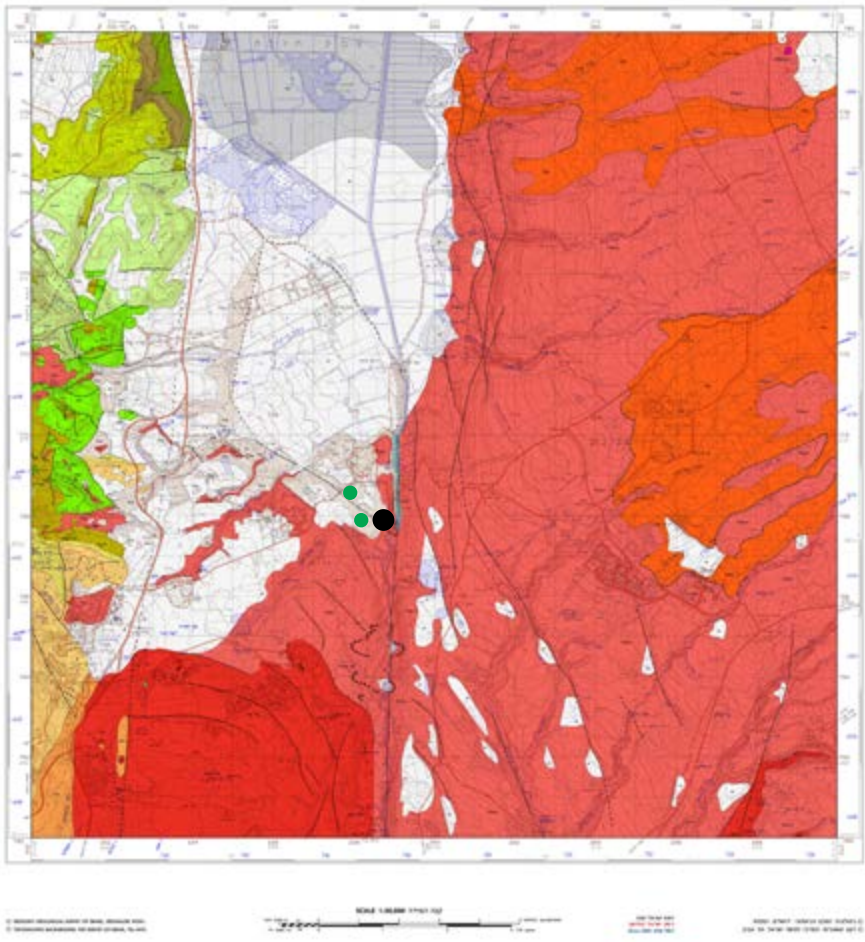


**Figure 4.5.** Rosh Pina Geological Map (fortress marked with black circle, quarries marked with green circles. Gadot formation in light brown. Shades of red and orange mark the different basalt formations). https://www.gov.il/he/departments/general/rosh-pina-map.

(Arsur), stone projectiles hurled from Mamluk siege machines (1265) created craters in the towers at the sides of the main gate which were built from smooth, well-dressed blocks.[17]

## The anatomy of a half-finished fortress

There is no recipe for building a fortress. Plans varied and different methods were used according to the location, the topography, local building materials, available funding, and the enemy they were meant to withstand. Descriptions of the building stages and timetables are quite rare. The most frequently quoted source is that of an anonymous French writer, who gives a comprehensive account of the building of the Templar fortress at Safed (1240–1243), in his work entitled: *De*

17 Raphael, K. and Tepper, Y. The Archaeological Evidence from the Mamluk Siege of Arsuf. *Mamluk Studies Review* IX 1 (2005), 85–100; Parlak, S. A. Typological Evaluation of Arrow Slits among Elements of Military Architecture in the Medieval Period (Istanbul University, 2011), 19–34 czasopisma.marszalek.com.pl/images/pliki/aoto/6/aoto602.pdf

*constructione castri Safed*.[18] This account, however, describes the enlargement and strengthening of an existing fortress; it is not a castle built from scratch.

A more reliable source regarding the order of building and the construction timetable can be found for the Muslim fortresses at Mt. Tabor (1217) and al-Ṣubayba (1227).[19] The work at Safed took two years; the Ayyubid construction at Mt. Tabor took two and a half to three years.[20] The completion of every part of each fortress (tower, gate, water cistern, etc.) was commemorated by an inscription giving the exact date and the name of the unit that had just been built.[21] Sadly, the Franks never followed this tradition of hanging detailed inscriptions in their fortresses.

During our twelve excavation seasons we uncovered what the Templars managed to build in eleven months, from October 1178 to the end of August 1179: the entire circumference of the curtain wall, the foundations and base of one corner tower and a main gate, three posterns (a fourth was detected in the centre of the western wall but was not excavated), one long barrel-vaulted gallery, and a large oven. There may well be more, but this is what was revealed through 2009, the last excavation season at Jacob's Ford.

## Building the frame: the construction of the curtain wall

By the time the fortress at Jacob's Ford was being built, the construction of curtain walls had developed into a fine art. If there was a manual explaining what material and techniques to choose, it was probably carefully studied and followed by the engineer or work supervisor at Jacob's Ford. The curtain wall at Jacob's Ford was also essentially a construction frame, the shell that supported most of the buildings inside the fortress. Galleries, halls, and storage areas 'leaned' on the curtain wall. Since the site was on the frontier and had no natural defences, priority was given to the construction of the curtain wall.[22] The men, equipment, food in storage, and livestock were dangerously exposed to both the weather and the enemy until the walls were completed. In fortresses further inland, whether Muslim or Frankish, priorities were somewhat different. At Mt. Tabor, according to the inscriptions, the curtain wall was the last part of the fortress to be completed. At Montfort, the keep was the first building constructed.[23]

---

18 A full translation is provided in: Kennedy, *Crusader Castles*, 190–198. The most comprehensive examination of this source is by Huygens, R.B.C. *De constructione castri Saphet: construction et functions d'un chateau fort franc en Terre Sainte* (Amsterdam, Oxford and New York, 1981); see also Pringle, D. Reconstructing the Castle of Safad. *Palestine Exploration Quarterly* 117 (1985): 139–149.

19 Amitai, R. An Arabic Inscription at al-Ṣubayba (Qalʿat Namrud) from the Reign of Sultan Baybars. In M. Hartal *The Al-Ṣubayba (Nimrod) Fortress, Towers 11 and 9*. IAA Reports 11 (Jerusalem, 2001), 109–123; Amitai, R. Notes on the Ayyubid Inscriptions at al-Ṣubayba (Qalʿat Nimrod). *Dumbarton Oaks Papers* 43 (1989): 113–119.

20 al-Maqrīzī, Taqī al-Dīn Aḥmad b. ʿAlī. *Kitāb al-sulūk li-maʿrifat duwal al-mulūk*. Eds. M. M. Ziyāda, and. S. ʿA-F Āshūr (Cairo, 1934–73), vol. 1, part 1: 176; Ibn Wāṣil, Jamāl al-Dīn Muḥammad b. Sālim, *Mufarrij al-kurūb fī akhbār banī ayyūb* (Alexandria, 1953) vol. 3: 212.

21 Raphael, *Muslim Fortresses*, 28.

22 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 91–93; Ellenblum, *Crusader Castles*, 268–270.

23 Raphael, *Muslim Fortresses*, 28–29; Khamisy, Masonry and Mason's Marks, 150.

**Figure 4.6.** A kiln for preparing lime, north of the fortress, looking south.

Both limestone and basalt were used to build the curtain wall at Jacob's Ford. The external faces were built of neatly dressed *nari* ashlars with a boss in the centre and flat margins. The core of the wall — the inner filling — was constructed of medium-sized basalt field stones, roughly uniform, laid in courses and mixed with a generous amount of mortar.

A kiln for preparing lime was found at the foot of the fortress (Fig. 4.6). The basalt compensated for the soft and porous qualities of the limestone. Abū Shāma gives a detailed description of the structure of the curtain wall:

> *"…its curtain wall was over ten dirāʿ wide, the largest of stones were cut and dressed for it, each stone was approximately seven dirāʿ, the number of ashlars [along the curtain wall] was above twenty thousand. Not every stone was set in its place and the cost of each stone was four dinar or more. The gap between the two walls was filled with stones as hard as granite; the high mountain peaks are low compared to it. The ashlars were immersed in lime [mortar], if a stone from the fortress was coated with a handful of it, the lime would merge with the stone as if it was part of it, and it fused in the strongest and most solid way; it thus hinted to the enemy that it is iron that cannot be destroyed."*[24]

The huge pile of small- and medium-sized basalt field stones found during the excavations near the main gate of the fortress, were brought to the site to create the core. The solid structure of the core was significantly stronger than the casing (Fig. 4.7). If the outer stones were removed, enemy sappers still had to cope with this solid basalt fill. The contour of the tel was followed carefully and where possible the lines of the curtain wall are long and straight (Figs. 4.8–4.10); in the north, where the tel's edge is narrow, the wall is built of four angled segments. The circumference of the fortress measures 378 m; its length from north to south is 145 m; its width in the south measures 56 m and 52

24 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmān b. Ismāʿīl, *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3: 42. c. One dirāʿ equals 58 cm.

**Figure 4.7.** Remains of the collapsed vault on the kitchen floor in Area E, looking east. Note the ashlar casing and basalt core (marked with yellow arrows).

m across the centre. In the soundings we made in the east, south and north, we never reached bedrock. The curtain wall's foundation trench was dug deep, cutting into the soil of the tel (Fig. 4.11). The basalt core was 2.8 m wide. The ashlar casing measured 1.60 m; the exterior ashlar courses are wider and larger than those of the interior ashlar courses. This provided an extra shield against bombardment from siege machines. The total width of the curtain wall measured 4.4 m. Two drainage channels were constructed in the eastern curtain wall. The height of the curtain wall courses varies between 45–60 cm. The outer face is built from large stones that are roughly even in size, the inner face is constructed of large, medium and small blocks in no consistent pattern (Table 4.1).

**Table 4.1.** Building stone measurements[25]

| SIZE | MEASUREMENTS (CM) |
|---|---|
| Extra large | 102 x 74, 112 x 51, 120 x 60, 130 x 61, 141 x 74 |
| Large | 90 x 59, 92 x 75, 95 x 60, 96 x 64, 95 x 65 |
| Medium | 67 x 60, 70 x 61, 83 x 70, 87 x 54 |
| Small | 38 x 56, 40 x 64, 40 x 70, 51 x 62 |

In his description of Saladin's siege and the tunnelling operation Abū Shāma mentions the width of the curtain wall:

25 The measurements of the stones along the fortress walls were taken by Dr. Ohad Zakheim (at the time a doctoral student at Haifa University's Department of Archaeology), who excavated the southern gate in 1994–1995.

**Figure 4.8.** Looking southwest, a stretch of the eastern curtain wall.

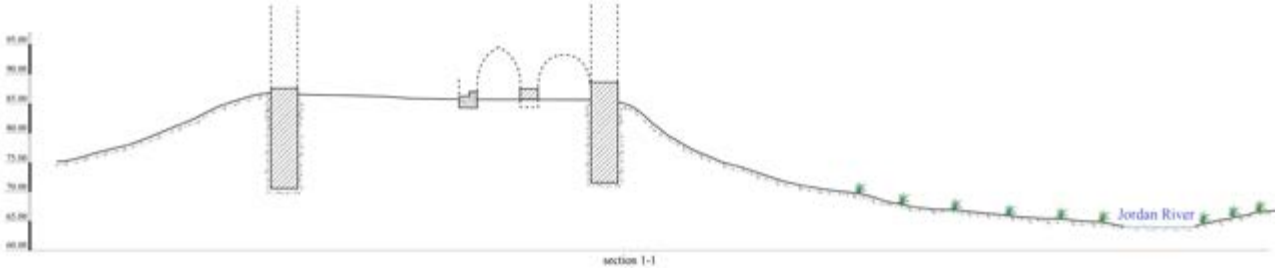



**Figure 4.9.** Schematic west-east section across the width of the fortress (drawn by Tania Melsten).

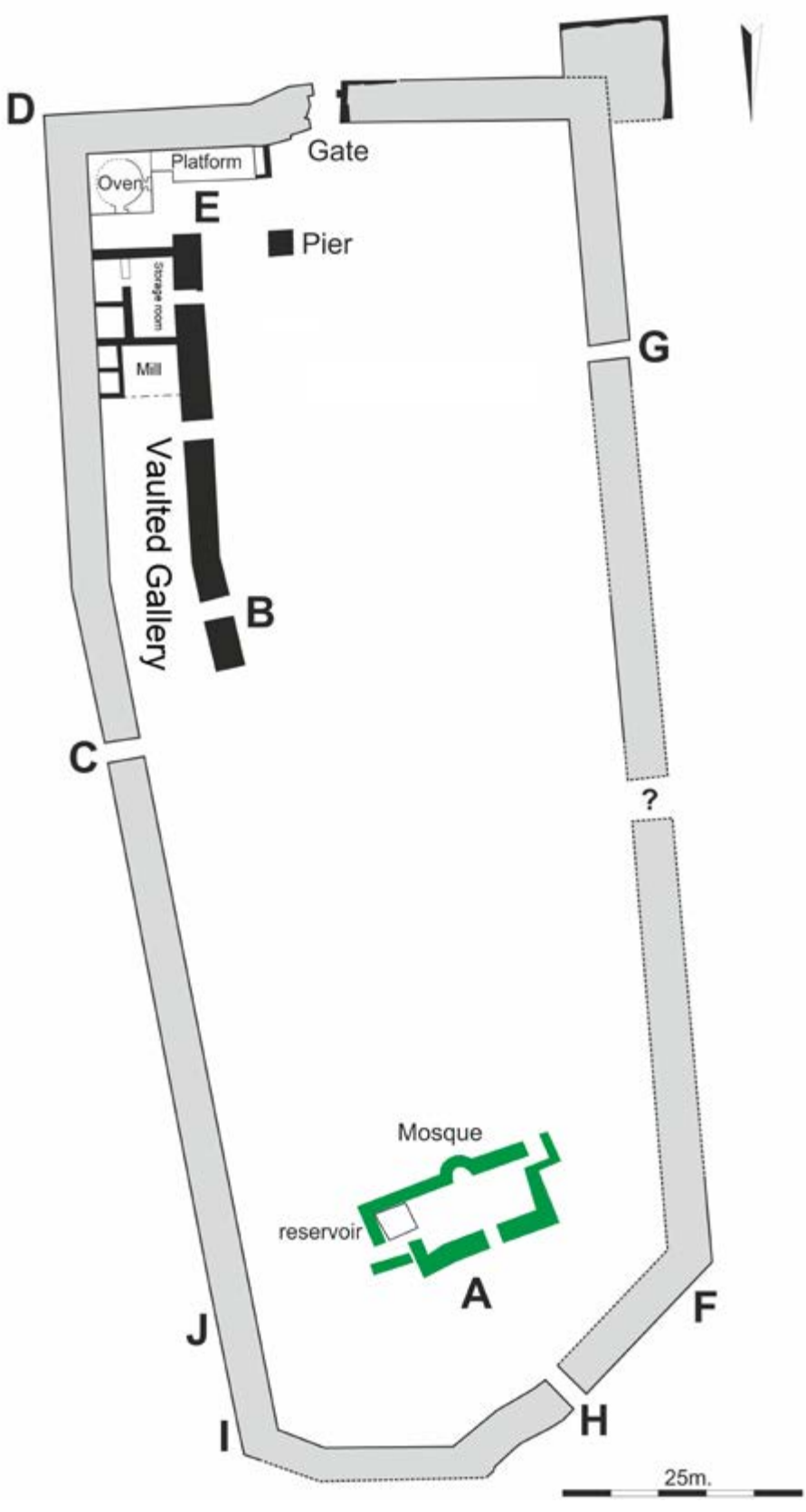



**Figure 4.10.** Plan of the Templar fortress at Jacob's Ford. The Mamluk–Ottoman mosque is shown in green. The capital letters indicate the excavation areas (plan renewed by Jay Rosenberg).

وكان عرض السور تسع اذرع.[26]

"The width of the wall was 9 adruʿ." One dhirāʿ is c. 58 cm, making a total width of 5.22 m.

This is an estimate given by eyewitnesses who briefly assessed the measurements and architectural structures during the siege in the midst of the fighting, the fire, and the smoke.

The soil from the foundation trench was used to cover the wall up to the level of the main gate and posterns (Fig. 4.9). The embankment of soil protected the foundations from the winter rains but could not protect the walls from the Muslim sapping units. Tunnelling under foundations that were laid on soil and protected by a soil embankment was a somewhat easier task than bringing down a wall that was laid on the bedrock and protected by a stone glacis. When this stage was concluded, the tel's slopes resumed their 'natural' appearance, and the crown of the tel was tightly hemmed by the wall (Fig. 4.8).

Although the fortress grounds are fairly even, the northern part is slightly higher (80 m asl) and would have been a spot well-suited to building the keep. The southern edge, where the main gate was positioned, measures 74.2 m asl. Carts carrying building blocks from the quarry could climb the moderate ramp, travel along the surface of the tel and distribute building blocks to the various working teams throughout the site. The stones could also be lowered from the top of the tel to the teams below. According to Professor Ellenblum, the soil dug from the foundation trench was used for constructing a packed dirt ring-road that served carts distributing building materials to the teams working along the wall. Thin layers of earth with sealing properties and crushed packed limestone can be seen in several sections along the embankment (Figs. 4.12–13). After the completion of every three courses, the embankment was raised, and three more courses were added until the wall reached the height of the tel.[27] If Jacob's Ford was meant to be a concentric fortress, the embankment would have eventually become the ward between the two defence walls.[28]


**Figure 4.11.** Curtain wall foundation in the south, dug deep into the ancient layers of the tel. The basalt stone wall (W61) dates to the Iron Age.

26 Abū Shāma, *Kitāb al-rawḍatayn* 3: 36. Dhirāʿ (ذراع) in Syria = 0.68 m.; in Egypt = 0.58 m, according to Wehr, H. *Arabic-English Dictionary*. J. M. Cowan (ed.) 4th edition (Wiesbaden, 1994), 356.

27 Ellenblum, R. and Boas, A. Mezad Ateret. *Excavations and Surveys in Israel* 109 (1999), 5–6; Boas, *Military Orders*, 258–259; Ellenblum, *Crusader Castles*, 268–269.

28 Ellenblum, *Crusader Castles*, 268.

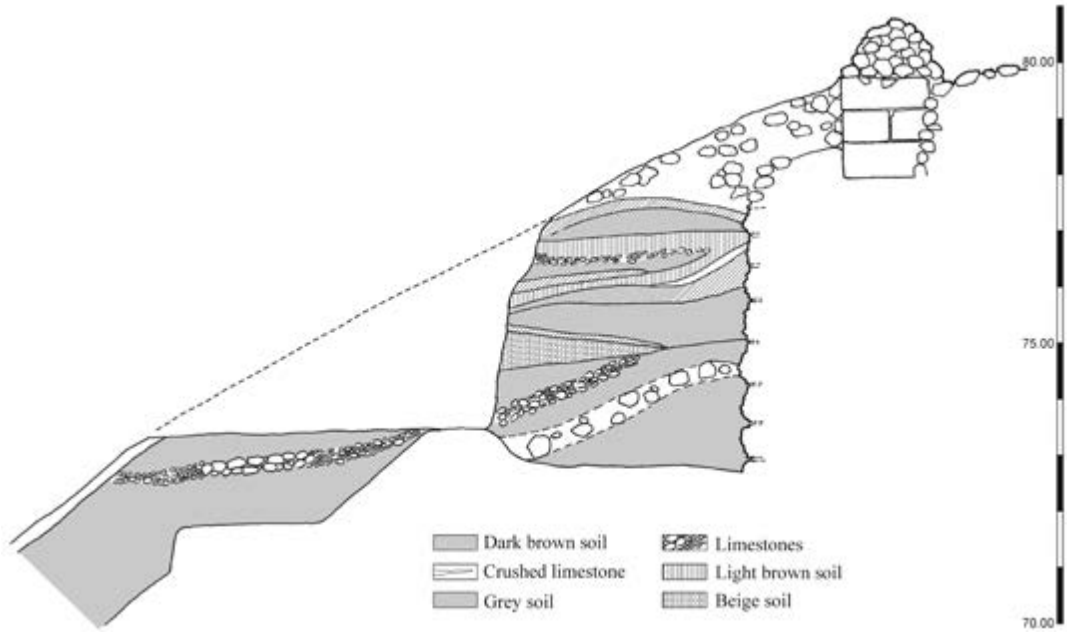



**Figure 4.12.** Section along the embankment at the north-western side of the fortress.

**Figure 4.13.** Photograph of the embankment baulk section in the north.

**Figure 4.14.** Fragment of an arrow embrasure.

Concerning the final height of the walls, several parts of arrow slits, found in the collapse during the excavations (Fig. 4.14), indicate the wall was very close to completion when Saladin besieged the site.[29] According to a description provided by ʿImād al-Dīn, after the *bāshūra* fell, the Franks fled behind the crenelated parapet at the highest part of the walls:

ودخلوا الحصن واغلقوا الابواب ووقفوا وراءها على شرافاته واشرفوا على شرفاته وملك اصحابنا الباشورة وملاوها وانتقلوا بكليتهم اليها وكلأوها.[30]

*"And they [the Franks] entered the fortress, bolted the gates, and stood behind the merlons [*شرافات*, the first toothed/jagged course] at the top of the fortress wall and they watched from behind the arrow embrasures [*شرفاته*] as our men who captured the bāshūra filled it, moved in, and defended it."*

ʿImād al-Dīn plays with two words that have a similar sound, *sharāfāt* (شرافات) and *sharfāt* (شرفات), but it seems that his rhyme reflects what his eye saw.[31]

## Arrow embrasures

One of the most important developments in late twelfth century Crusader fortifications are the improvements made to accommodate large numbers of archers in the defence of the fortresses. Bows were the most accurate and only long-distance weapon. The number of arrow embrasures was increased considerably both along the curtain walls and the towers.[32] Their design provided archers with more space and better angles of fire, reducing the dead ground along the perimeter of the fortress and making it difficult for the enemy to approach the foot of the walls.

A rough reconstruction of the arrow slits can be made from a number of fragments revealed during the excavation of the eastern postern. The arrow slits were c. 1 m high, with an internal splay and a plunging base. Behind them was an arched casemate or rare-arch, providing space for the archers to stand, draw their bow and manoeuvre with greater ease, in contrast to the narrow arrow loops at Belvoir and ʿAjlūn, where the archers stood on

29 Boas, *Military Orders*, 258–259.

30 ʿImād al-Dīn al-Iṣfahānī, *Sana l-Barqu al-Shami* (Riyadh, 1989), 169.

31 I would like to thank Dr. Amir Mazor for his translation of all the Arabic texts in this chapter and for his wise and helpful comments and suggestions. This chapter could not have been completed without his knowledge and advice.

32 Shapira, Y. *The Tower in the Crusader Kingdom of Jerusalem*. M. A. Thesis. The Hebrew University of Jerusalem 2000 (Hebrew); Raphael, K. *Archers in the Crusader Kingdom*. M. A. Thesis. The Hebrew University of Jerusalem 2001 (Hebrew).

the threshold of the arrow embrasure.[33] The number of arrows found inside and outside the fortress gives a vivid picture of the archers' role in the siege and the battle that took place inside the fortress, a subject we discuss in Chapter 5.

## The main gate, one modest tower, and three posterns

The main entrance and its façade were meant to inspire respect, awe, and fear. Yet gates had to be practical, allowing the passage of loaded carts, draught animals, and men on horseback. With regard to defence, being a break in the curtain wall and situated at ground level, they were often the obvious focal point of an assault. Built out of wood and lacking the strength of solid stone, the doors themselves had to be concealed from the enemy's siege machines, fire bolts, and battering rams. The 'bent' gateway provided the best protection. If the enemy managed to enter, they had to slow down in order to turn the corner leading to the main entrance. Although the 'bent' gateway offered greater protection, simple straight entrances continued to be built throughout the twelfth and early thirteenth centuries in castles owned by both the nobility and the military orders.[34]

**Figure 4.15.** The main gate, looking west.

The gateway at Jacob's Ford is a straight simple passage of modest size, 2.8 m wide (Figs. 4.15–4.18). Slots on both sides indicate it had a portcullis. A narrow channel carved in stone, east of the gate, housed the timber draw-bar that bolted the doors. A similar, but not identical, gate can be seen at Crac des Chevaliers (dated to 1170), protected by a small chamber on each side, where a guard could be stationed.[35] If Jacob's Ford was intended to be a concentric fortress, the entrance we excavated would have served as the inner gate. This would explain its simple and practical design that served the needs of a large active building site. While the fortress was being built, it could be bolted at night

33 Raphael, *Muslim Fortresses*, figure 1.18.

34 Boas, *Military Orders*, 125, 166–167. Good examples of straight entrances can be seen at Crac des Chevaliers (first phase, 1170) and at Arsuf.

35 Deschamps, P. *Les Chateâux des Croisés en Terre Sainte I.: Le Crac des Chevaliers.* Album (Paris, 1934), Plan 1; Biller, T., Burger, D., Großmann, U.G., Häffner, H.H., Radt, T. and Schmitt, R. Nochmals zum Crac des Chevaliers — Anmerkungen zum Forschungsstand. Originalveröffentlichung. In M. Goer *Die Pfalz Wimpfen und der Burgenbau in Südwestdeutschland* (Forschungen zu Burgen und Schlössern 15) (Petersberg, 2013), 240, Fig. 4. 2.

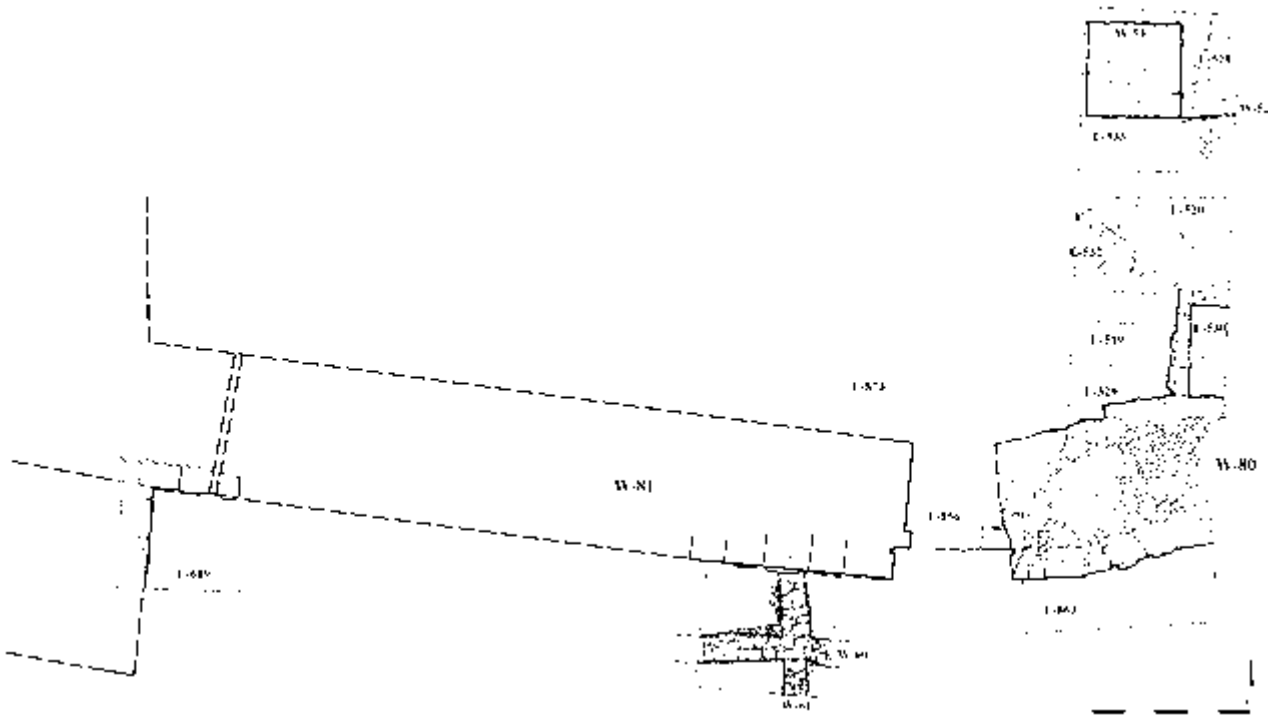



**Figure 4.16.** Plan of the main gate. The eastern side was partially destroyed by the 1202 earthquake. Smaller walls south of the gate (W60 and W61), date to the Iron Age.


**Figure 4.17.** The main gate, western wing, looking southwest.


**Figure 4.18.** The main gate, eastern wing, looking southeast, partially destroyed by the 1202 earthquake.

**Figure 4.19.** A metal trowel found inside the fortress next to the western wing of the main gate (Area E, L873, B8570).

**Figure 4.20.** A metal hammer found inside the fortress next to the western wing of the main gate (Area E, L873, B8570).


**Figure 4.21.** Tools, a pig skeleton, and a glazed Crusader bowl in a burnt layer next to the gate's western wing.

**Figure 4.22.** The southwest tower, looking east.

**Figure 4.23.** The seam between the tower and the curtain wall.

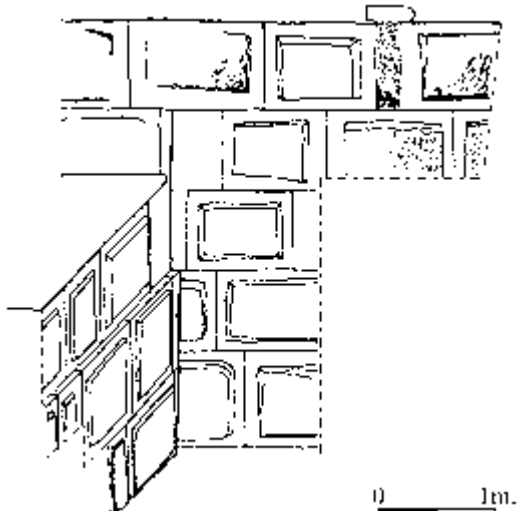



**Figure 4.24.** Drawing of the seam between the tower and the fortress wall

to secure the place against theft, and the animals against predators, but it could not with stand a full-scale assault.

Evidence of the fierce fighting that took place inside the fortress could be seen along the gate's western wing. Two metal trowels, a hammer, nails, and an almost complete glazed bowl, as well as numerous arrowheads, were found in a thick layer of ash mixed with burnt pig bones (Area E, L873; Figs. 4.19–4.21). All the contemporary Muslim accounts describe the fires behind the gates lit by the Templars to prevent the Muslim force from storming in. The work tools indicate that the gate was still being built in August 1179 when the siege began. While the gate was no doubt attacked during Saladin's siege, most of the damage on the eastern side was caused by the 1202 earthquake.

The tower built at the southwest corner (11.6 x11.6 m), is the only tower we found (Fig. 4.22). It was 'glued' to the curtain wall rather than incorporated into it (Figs.4.22–4.24). It was probably part of the gate complex, allowing archers to shoot from a very short distance at anyone who approached the entrance. This configuration of a corner tower that protects an entrance can be seen at Belvoir.[36] As in the rest of the fortress, many of its stones were robbed, leaving only the inner core. Abū Shāma's account mentions a well-built tower, he also immediately adds that it was difficult to dig below its foundations:

وصعب نقبه وكان البرج محكم البناء.[37]

The excavation along the edge of the tower did not reveal signs of a strong fire that scorched the stones. Although most of the tower was robbed, its base is sound and solid; there are no cracks or signs of severe damage.

Posterns were built in accordance with the size and the particular surroundings of each fortress. Some were essentially designed as emergency exits and were concealed from the enemy. Others were

36 Pringle, D. *Secular Buildings in the Crusader Kingdom of Jerusalem* (Cambridge, 1986), Fig. 4. 16.
37 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 32.

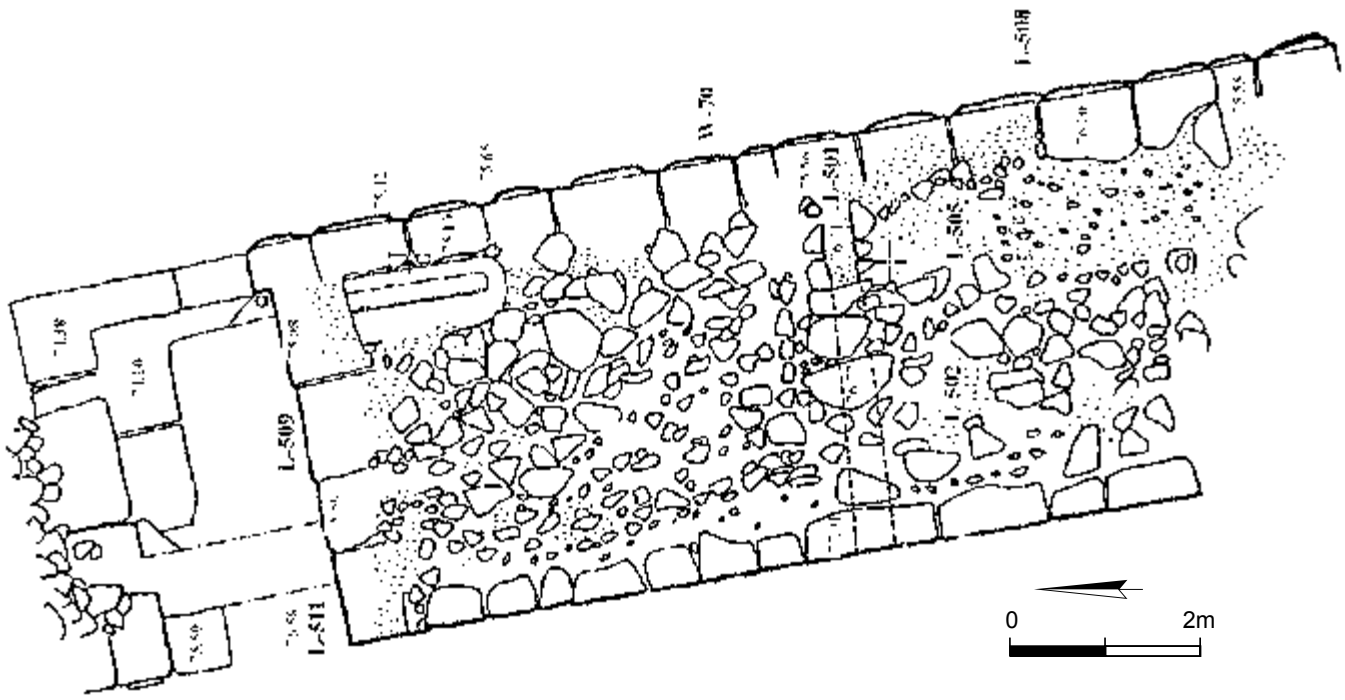



**Figure 4.25.** Plan of the eastern postern (Area C, L509, L511).


**Figure 4.26.** Eastern postern (looking east down to the Jordan River).


**Figure 4.27.** Hoe found in front of the eastern postern.

**Figure 4.28.** Pick and axe found in front of the eastern postern (Area C, L572).

**Figure 4.29.** The western postern, looking east into the fortress grounds (Season 1994, Area G, L221).

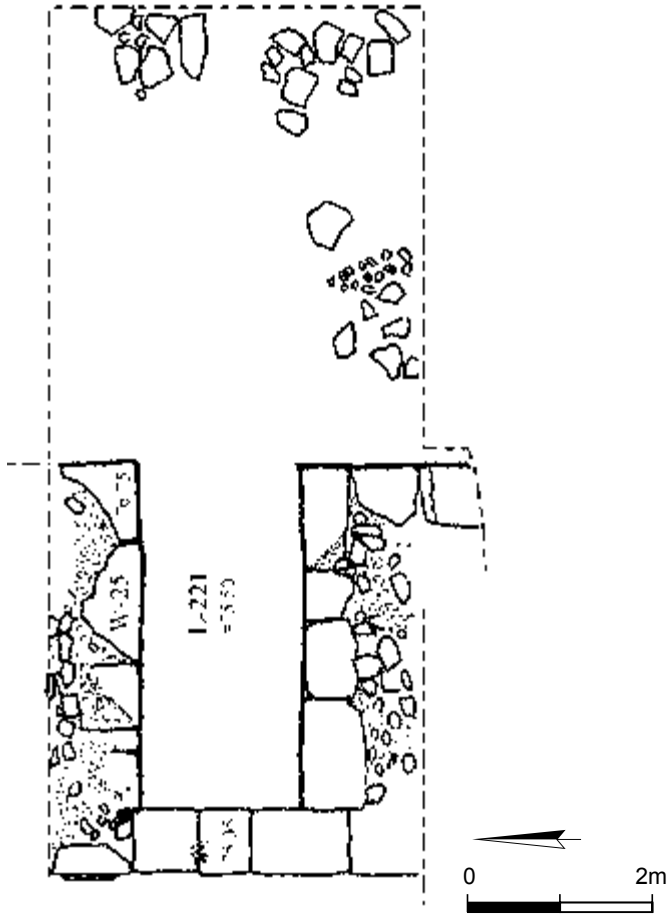



**Figure 4.30.** Plan of the southwestern postern (Area G, L221).

intended to serve as exit points for sorties. Three posterns were excavated at Jacob's Ford, one at the centre of the eastern curtain wall which looks down on the Jordan River. A second postern was revealed in the southern section of the western wall and a third at the northwest edge of the fortress. A fourth postern probably exists in the centre of the western curtain wall, but it was neither cleared nor excavated. All three excavated posterns were built of smooth well-dressed stone blocks; their scale and design are similar, with slight variations in width (eastern postern: 1.12 m, western: 1.73 m, northwestern: 1.60 m). They all had one door that opens into the fortress, and a wide channel that housed a draw-bar to bolt the door (Fig. 4.23). The posterns could have served as entrances into towers or into the bailey, if a second curtain wall was planned. The building of three towers along the west would have been efficacious, as the area on this side was fairly flat and devoid of natural defences.

As in the main gate, remains of the battle could be seen in all three posterns. Once the layer of earth and collapsed stones was removed from the eastern postern, we literally entered the battleground. A pile of mortar that was being mixed (Area C, L572), a spade, hoe, picks, and an axe, found in front of the postern, attested to a group of 5–7 men who were working there, and dropped their tools when the siege began (Figs. 4.27–4.28). Remains of a strong fire, numerous arrowheads, fragments of burnt wood and tens of nails were scattered all around.

A similar picture surfaced at the south-west and north-west posterns (Figs. 4.29–4.30). An iron mace head, our prized find, the only weapon we found other than the arrowheads, was uncovered inside the south-western postern. It lay in a burnt layer next to the remains of charred wood, iron nails, arrowheads and burnt animal bones.

## The long vaulted gallery and the covered entrance hall

Once the eastern curtain wall reached c. 2 m above the surface of the tel, work began on the construction of essential buildings within the fortress. The long vaulted gallery constructed parallel to the eastern curtain wall had storage rooms, a large oven, and a mill built inside it (Areas E, E1, B, and K). It set before us gruesome scenes of close quarter warfare, as well as an essential part of the kitchen's daily routine. At the end of the siege Saladin's men destroyed the gallery, its roof collapsed and sealed the layer below it. We were the first to enter since its destruction at the end of August 1179.[38]

As one came into the fortress, through the main gate, one stood in the entrance hall below two cross vaults supported by the curtain wall, the edge of the long wall that ran parallel to the curtain wall and a large pier (3 x 3 m).[39] Its somewhat uneven floor was made of crushed, packed limestone. If one walked further on and then turned east (right), one stood in front

38 Part of the oven and perhaps the vault remained standing after the battle. Evidence of the latter derives from a unique small mammal assemblage found nearby the kitchen on a pile of equid skeletons. See Chapter 11 by M. Belmaker and E. Miller.

39 I would like to thank Dr. Vardit Shotten-Hallel (Israel Antiquities Authority) for her help and advice in the architectural reconstruction.

**Figure 4.31.** Looking south, Areas: E, E1, K and B — the long vaulted gallery, kitchen, main gate and oven. The entrances into the gallery are marked with black arrows and the oven is covered with a corrugated iron roof.

of the long, barrel-vaulted hall. While it may have not been the most aesthetic building, it fulfilled the needs of a fortress and suited the climate.[40] The barrel-vaulted hall was bounded and supported by the eastern curtain wall and a massive, parallel long wall (length 44 m, width 3 m, height 2 m). It was a solid, spacious structure (width 8.6 m). We excavated three entrances (Figs, 4.10, 4.31–4.37), that led into three large rooms. The partition walls between the rooms were constructed from basalt field stones (0.95 m thick; 2.10 m high). There were no internal passages between the rooms; it seems the idea was to protect each room from a possible fire in the kitchen. The vaulted roof was built of small, roughly rectangular limestone blocks (length 45 cm, width 33 cm, height 17 cm) and a most generous amount of mortar (Fig. 4.33).

40 "Where brilliant sun and blazing skies placed a premium upon shade and shelter, the barrel vault was a thoroughly practical device." Acland, J. H. *Medieval Structure: The Gothic Vault* (Toronto, 1972), 39.

**Figure 4.32.** Close-up of the oven (yellow arrow) in the southeast corner (Area E).

**Figure 4.33.** The collapsed vault, sealing the entire gallery (Area E, L456).

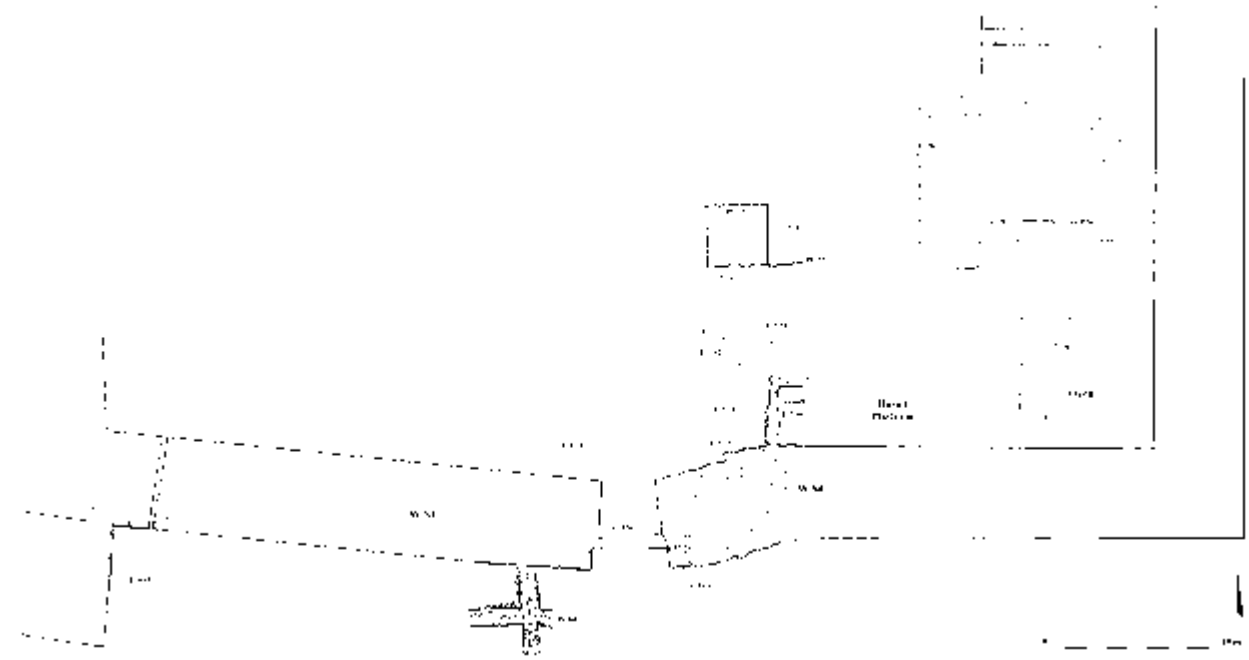


**Figure 4.34.** Plan of kitchen and first room in the long gallery (Area E).

**Figure 4.35.** Entrance to the first storage room in the gallery.

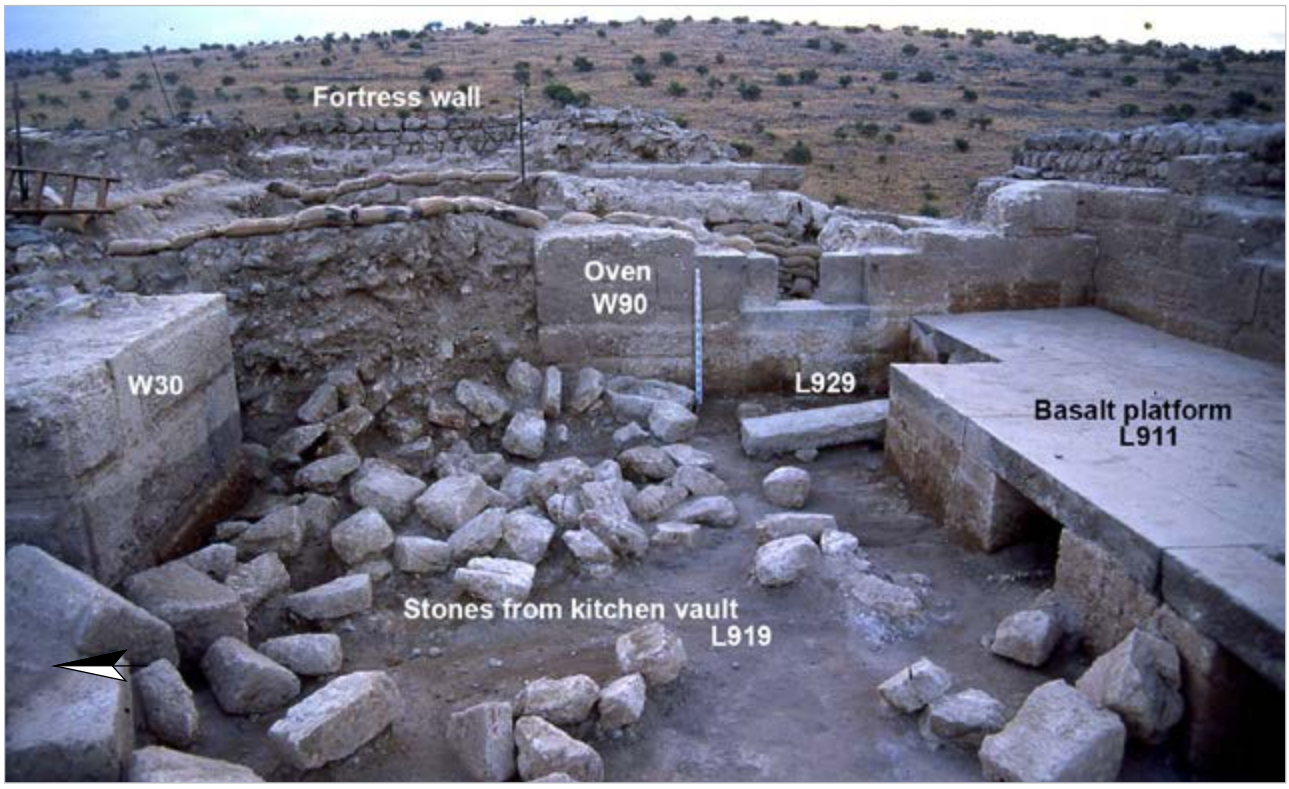



**Figure 4.36.** Remains of the collapsed vault on the kitchen floor (Area E, looking east).

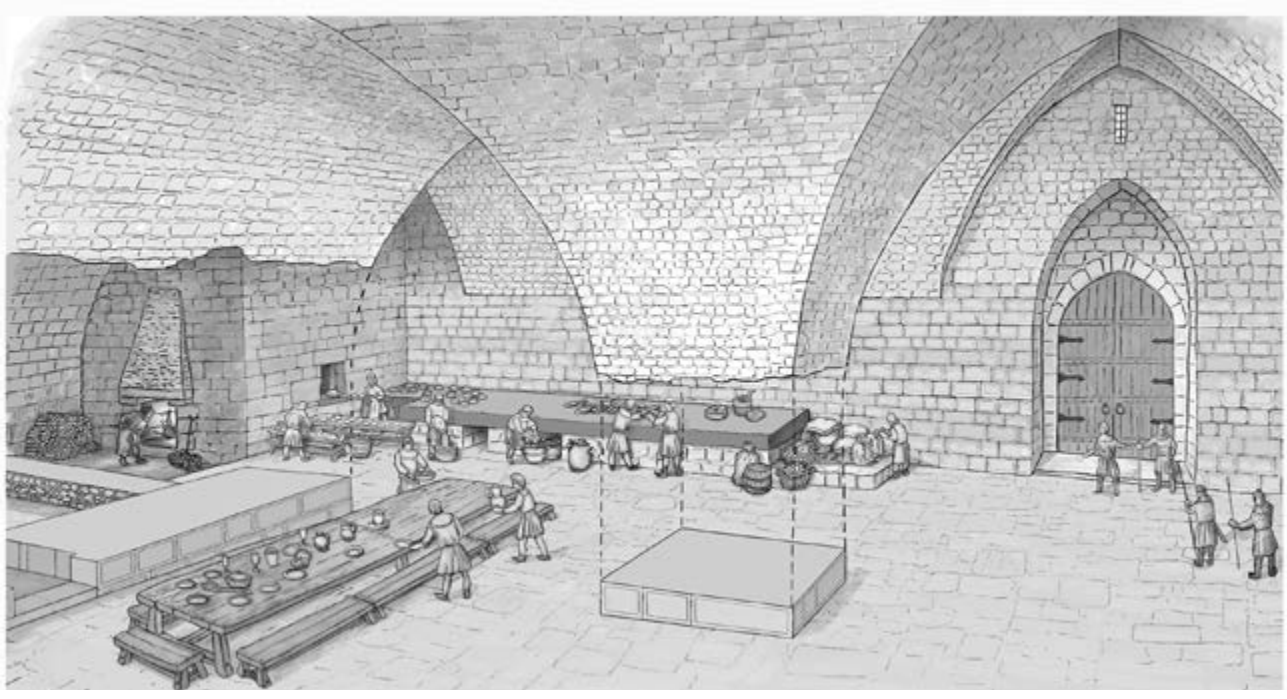


**Figure 4.37.** Reconstruction of the kitchen (drawn by Tania Melsten).

## The mill, the storage room, and the large oven

During the first months of construction, when the Frankish army was stationed at Jacob's Ford alongside the workmen, hundreds of men had to be fed on a daily basis.[41] The construction of the kitchen, a bakery with a large oven, a mill and a large dry storage room were given priority. It seems bread and wheat cereals formed an important part of the men's staple diet.[42] Wheat had to be bought since there were few villages in the immediate vicinity that cultivated the land. The construction of a mill within the fortress grounds or next to it, was a necessity, and can be seen in a number of fortresses.[43] The shelf life of flour is apparently longer than grain, which may germinate;[44] this led to a carefully maintained balance between the stocks of grain and flour.

A 'donkey mill' was constructed inside the vault, next to the first storage room. Fragments of a large lower basalt grindstone (diameter: 1.13 m, thickness: 0.09 m) were found in the fill above a coarse basalt floor. Embedded in the floor was a U-shaped basalt stone that served as the base/socket that supported the wooden pole and secured the grindstones in place (Figs. 4.38–4.39). Charred wheat


**Figure 4.38.** Milling room in the vaulted gallery (Area E).

41 The number of men is discussed in detail later in this chapter.

42 Yehuda, L. Cooking and food in the Latin Kingdom of Jerusalem. In I. Ziffer, I. and O. Tal (eds.) *Last Supper at Apollonia* (Tel-Aviv, 2011), 52–53; Bronstein, Y. The Hospitallers and the Templars, Food and Refractories in the Twelfth and Fourteenth Centuries. In I. Ziffer and O. Tal (eds.) *Last Supper in Apollonia* (Tel Aviv, 2011), 66–67; Ofir-Shemesh, A. "And in the land of Ishmael they do like this and there is no finer bread than it": The Influence of Islamic Cuisine and Diet on Rabbi Abraham Ibn Ezra's Biblical Commentaries. *Jewish Studies; an Internet Journal* 15 (2019): 10–13; Wains, D. Cereals, Bread and Society. *Journal of Economic and Social History of the Orient* 30 (1987): 255–285.

43 Boas, *Military Orders*, 160–162.

44 Peacock, D. and Williams, D. Introduction. In D. Peacock and D. Williams (eds.) *Bread for People: The Archaeology of Mills and Milling*. BAR International Series 2274 (Oxford, 2011), ix.

**Figure 4.39.** Grindstone inside the milling room (looking north).

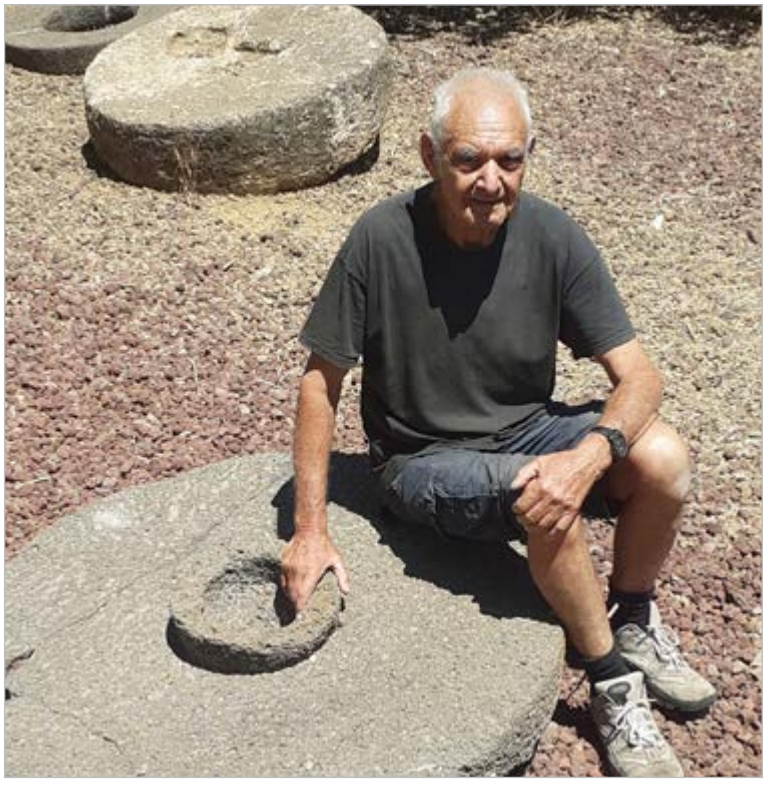


**Figure 4.40.** Yoske Arbel sitting on the grindstone.[46]

was found in the burnt soil around the basalt socket, and at the entrance to the room. The upper grindstone was found outside the vault next to three human skeletons and a pile of pig bones. Two plastered chambers (chamber measurments:1.7 x 2.0 m, depth 2.3 m) for storing flour and/or grain were revealed next to the mill, and in the storage room between the mill and the oven (Figs. 4.38–4.43).[45] [46]

45 Similar chambers were found at a milling site near Acre. See Lerer, Y. The Flour Mills in the Ridwan Gardens, ʻAkko. *ʻAtiqot* 87 (2016), 132, figures 8–9.

46 Yoske Arbel is a member of Kibbutz Gadot who participated in numerous surveys and established an archaeological garden on the kibbutz with finds from the fortress and other sites in the area. His knowledge of the history and archaeology of the region has been of great value for our research.

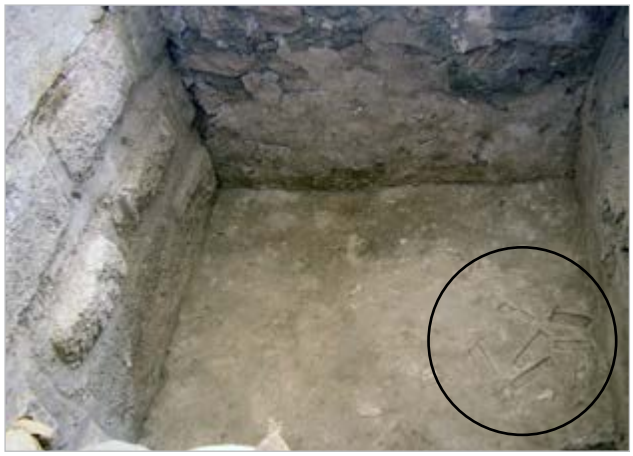


**Figure 4.41.** (left) Inside the storage chamber, floor with brick marks (Season 2007. Area E, L105).
**Figure 4.42.** (right) Hadas Motro inside the storage chamber. Collapse above the chamber floor (Season 2007. Area E, L100).

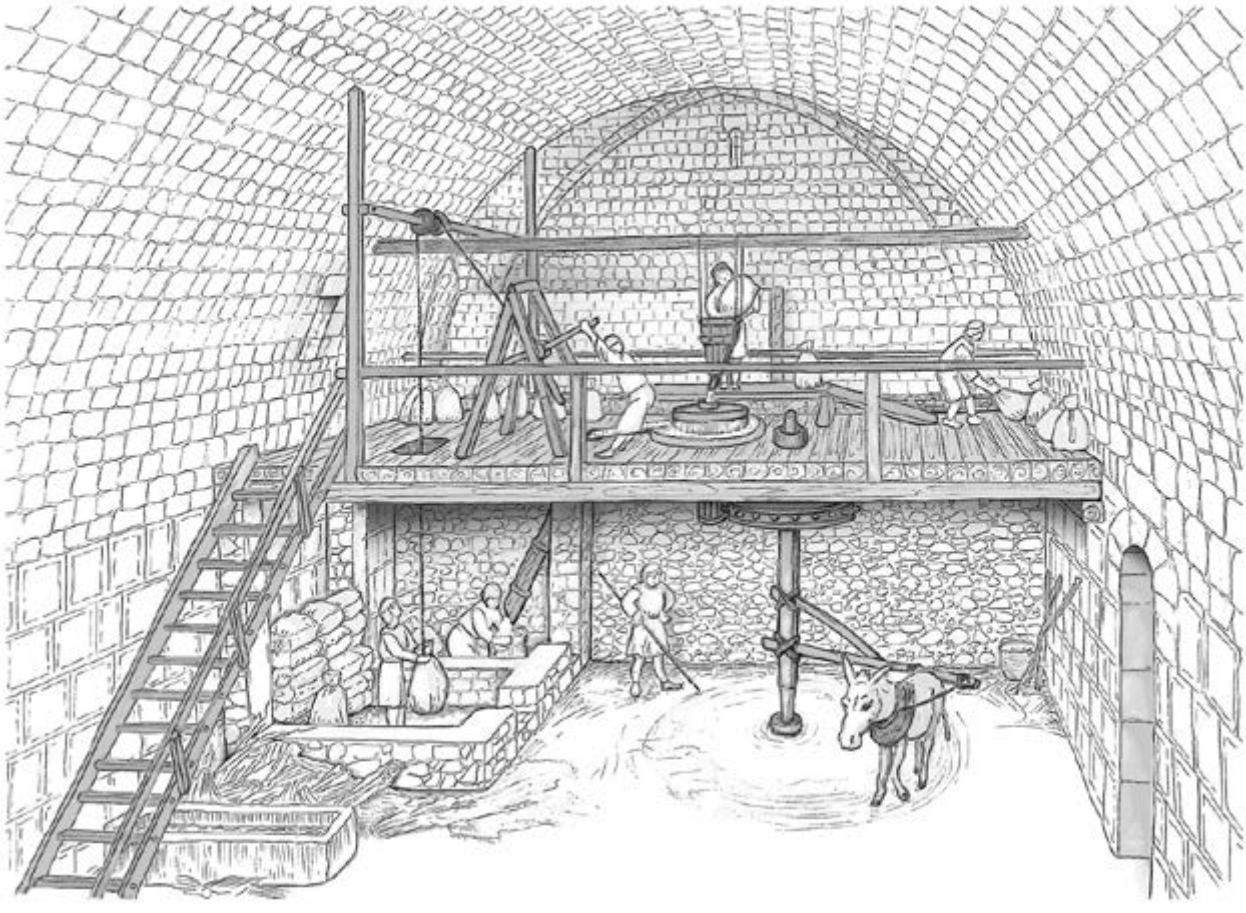


**Figure 4.43.** Reconstruction of the milling room (drawn by Tania Melsten).

## The large oven

The most interesting construction in this long gallery is the double chambered, domed, pear-shaped oven, set in a square frame (6.4 x 6.4 m, preserved height 3 m), that fits neatly into the southeast corner of the fortress (Figs. 4.44–4.46).[47] The lower chamber of the oven (5 x 4 m) had shafts/air channels (10–20 cm wide), built with fired mud bricks, set all around the inner wall Figs. 4.47–4.48). A small, partially preserved arched opening (55 x 60 cm) in the north was used to feed firewood. The threshold was made of finely dressed basalt flagstones and the oven floor was made of small stones set in a thick layer of mortar. Above the floor we found a layer of fine ash almost 20 cm thick, that contained fragments of animal and fish bones.

The upper chamber (diameter 5.5 m, height approximately 1 m) is only partially preserved, most of its dome had collapsed. A small, ornamented opening on the west (50 x 30 cm), at the height of a man's waist, was used for removing the loaves and cooked dishes from the oven with a bread shovel (Figs. 4.44, 4.50).

The oven's masonry is of a better quality than that found in most of the fortress, being a mix of limestone ashlars with a boss, blocks with fine combing, and well-dressed basalt slabs. We found no evidence of a chimney, but only the western half was excavated (the eastern half was unstable and not safe to work below). Similar, but not identical, double chambered ovens were found in Crac des


**Figure 4.44.** The oven's western façade (Area E).

47 Boas, *Military Orders*, 160, 162, 258–259. For a comprehensive study focusing on double chambered ovens in Crusader fortresses, see: Mesqui, J., Goepp, M. and Yehuda, L. *Bread for all. Double-chambered baking ovens in castles of the Military Orders*. Id: hal-02444208 https://hal.archives-ouvertes.fr/hal-02444208 1–15. A detailed description of the oven at Jacob's Ford is provided by the authors (pp. 2–4), together with an interesting discussion of how those ovens functioned.


**Figure 4.45.** Plan of oven (Area E).

Chevaliers, Arsuf and Atlit.[48] According to calculations made by Mesqui, Goepp and Yehuda, the oven at Jacob's Ford could produce 180 loaves of bread at a time. The smooth, basalt platform (10.7 x 3.4 m) with a recess, built next to the oven (Fig. 4.49), would accommodate the laying of between 190 and 215 bread loaves.[49] The three small niches below the platform could have been used for storage. No clues were found inside the soil that filled them. A shallow rectangular plaster compartment or trough (length: 3.05 m; depth: 0.54 m; width: 1.35 m) hemmed the western side of the basalt platform. It may have contained water or been used to mix and prepare large quantities of dough. Among the collapsed stones of the vault above the kitchen floor there were a number of stones with iron rings that could have served for hanging utensils and lamps or tethering animals. There was also a crude stone trough with a tethering hole on the floor next to the oven. It was not always possible to get an exact idea of the purpose of each item, and why they were placed where we found them.

The room with plastered chambers located between the mill and the oven could have been used to store flour or grain or other food supplies. The northern half of the gallery was not excavated. We assume it continued along the entire length of the eastern curtain wall.

The battle scene uncovered on the floor of the kitchen was complex and unsettling. Animal and human skeletons were strewn throughout in positions that allowed us to envisage their painful deaths. A man with his arm above his head lay in the corner between the basalt platform and the oven and an equid's skull was uncovered in one of the small chambers below the basalt platform, where its head was trapped (Fig. 4.51). A jaw of an equid and a human skeleton lay next to each other on the northern side of the large oven (Figs.4.52–4.53). The din of battle quieted when the vault collapsed and buried the men and animals trapped below it, turning the hall into a haphazard tomb.

48 Johns, C. N. *Pilgrims' Castle (ʿAtlit), David's Tower (Jerusalem) and Qalʿat Rabad (ʿAjlun*). Ed. D. Pringle (Aldershot, U.K., 1997), Fig. 4. 10; Roll, I. The Encounter of Crusaders and Muslims at Apollonia–Arsuf as
Reflected in the Archaeological Finds and Historical Sources. In I. Roll, O. Tal and M. Winter (eds.) *The Encounter of the Crusaders and Muslims in Palestine* (Tel Aviv, 2007), 71–74; Mesqui et al. Bread for all: 1–3, 7–9.

49 Mesqui et al. Bread for all, 12.

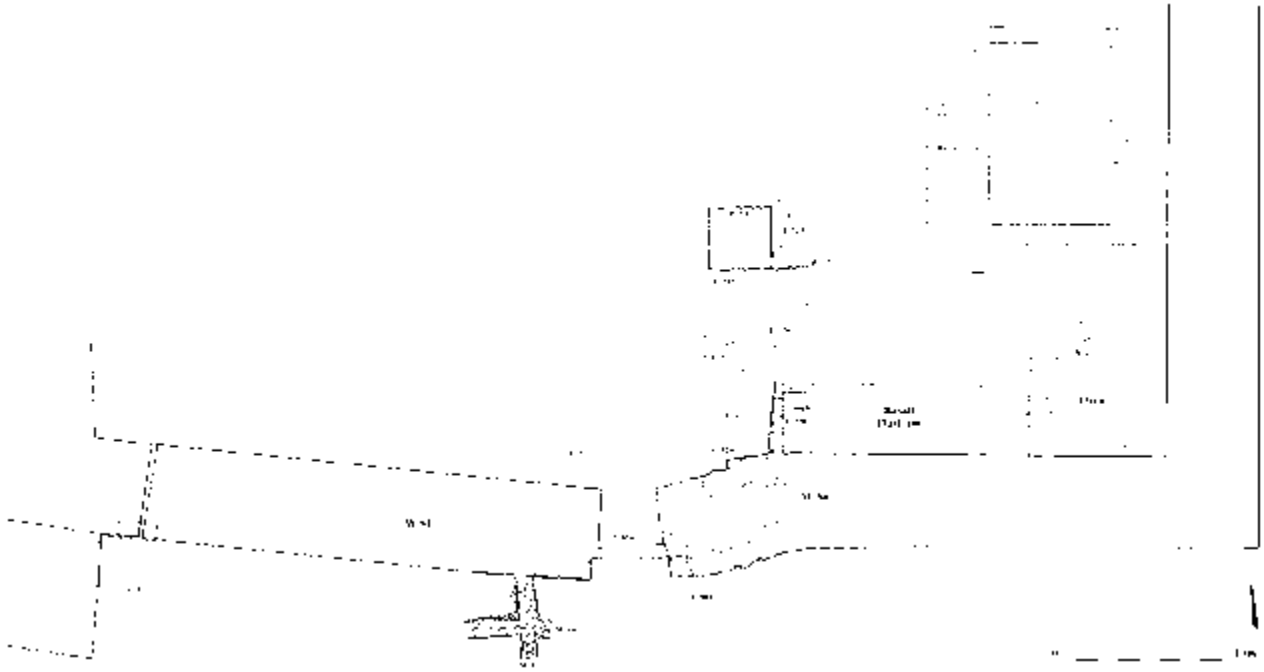


**Figure 4.46.** Plan of kitchen in the southeast corner of the fortress (Area E).


**Figure 4.47.** (left) Inside the oven (Season 1996, Area E).
**Figure 4.48.** (right) Air shafts in the oven (Season 1996, Area E).

**Figure 4.49.** The kitchen and basalt platform with the remains of the collapsed vault, looking south.

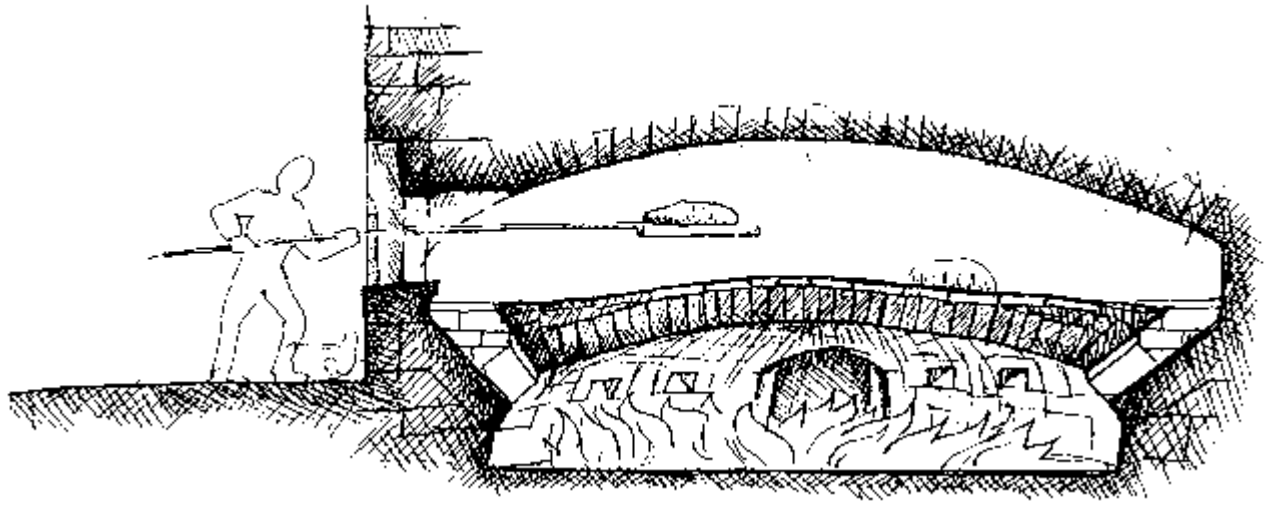


**Figure 4.50.** Reconstruction of the oven (unknown artist).

**Figure 4.51.** Equid skull found in the chamber below the basalt platform (Area E).

**Figure 4.52.** Human skeleton and equid jaw on a thick burnt layer at the northern opening of the oven (Area E, L930).

**Figure 4.53.** Equid skeleton on the kitchen floor (Season 1996. Area E, L466).

## A mosque converted into a church (?)... and converted bac k into a mosque

ʿImād al-Dīn mentions a Muslim shrine that existed prior to the construction of the Templar fortress.[50] The shrine commemorated a local tradition, according to which the patriarch Jacob received the tragic news regarding Joseph's death.[51] Contemporary Arabic sources refer to the shrine and the site on which the Templar fortress was built as *bayt al-aḥzān*—"the house of sorrow," or *al-mashhad al-yaʿqūbī* (the *mashhad* — a site of veneration — of Jacob). The ford was known as *makhāḍat al-aḥzān* "the ford of sorrow." According to Professor Ellenblum, the shrine mentioned by ʿImād al-Dīn may have been built by Nūr al-Dīn. It seems more than plausible that the Templars found the Muslim shrine, adapted and adopted both the tradition and the shrine as a site of Christian importance and converted it into a church. The existence of a church in the castle is mentioned only by Sibṭ ibn al-Jawzī (1186–1256), who describes a church that was converted into a mosque after the destruction of the fortress by Saladin in August 1179.[52]

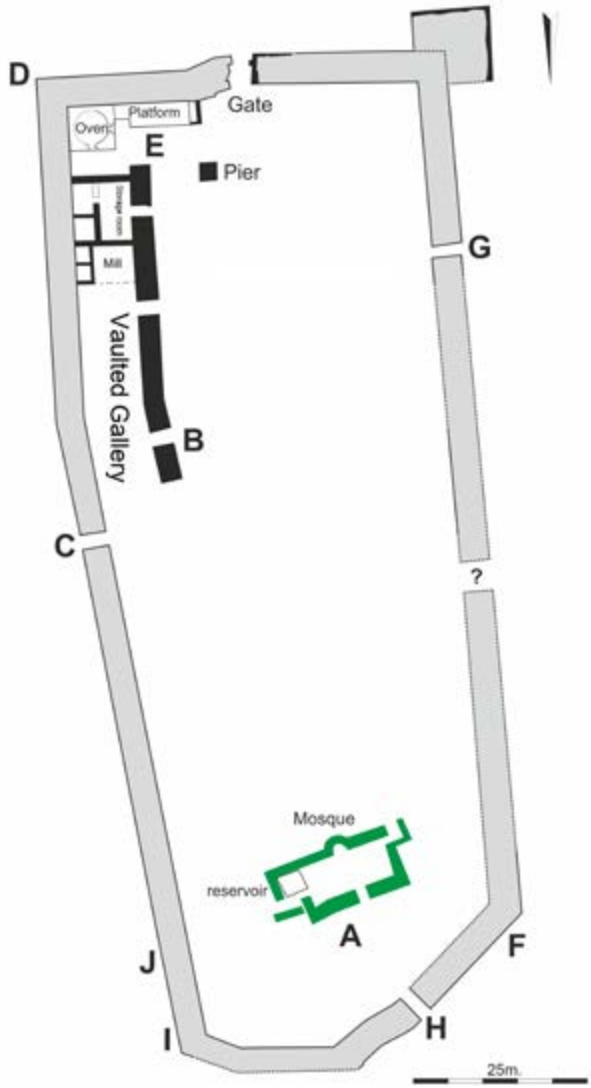



**Figure 4.54.** Plan of the fortress, with the mosque marked in green.

The archaeological evidence, however, does not support the historical sources. The mosque excavated at the northern edge of the fortress (16 x 10 m) had two phases (Figs.4.54–4.55). The thick walls of the second phase were constructed from complete and broken limestone ashlars from the Templar fortress as well as basalt field stones. It had a plastered floor that was covered by a thick layer of collapse (Area A, L111 in Season 1993 and L152 in Season 1994). Pottery from above

50 ʿImād al-Dīn, *Sana l-Barqu al-Shami*, 170–171.

51 Prawer, *Latin Kingdom of Jerusalem*, vol. 1: 449–450; For a detailed historical account and analysis of the Muslim shrine, see Ellenblum, Frontier Activities, 83–97.

52 Ellenblum, Frontier Activities, 86.

**Figure 4.55.** The mosque, looking south.

this floor and below the collapse was defined as Mamluk.[53] The earlier first phase was revealed in a probe below a patch of plastered floor, exposing a floor of basalt fieldstones. An illegible thirteenth century Ayyubid coin was found on the floor (Area A, L252, B2521).[54] A probe made below the basalt stone floor foundation exposed Hellenistic walls that were incorporated into the mosque's floor.

The mosque that can still be seen today was built in the Mamluk period using the Ayyubid floor and the foundation courses. As in the second phase, it was built from broken fortress ashlars and basalt stones. Its *miḥrāb* (the prayer niche facing south towards Mecca), faced with bricks, probably dates to the later Mamluk period. Few mosques of this size have been found in the Golan. The nearest rural Mamluk mosque was excavated in Qasrin (c. 7 km east of the fortress).[55]

53 See Chapter 14, an account of the Mamluk village pottery, by Yael Arnon.
54 Regarding the coin see Chapter 17 by Robert Kool.
55 Ma'oz, Z.U. and Killebrew, A. E. Ancient Qasrin: Synagogue and Village. *Biblical Archaeologist* 51 (1988), 5–19. Regarding the Mamluk settlement on the fortress, see Chapter 6.

## Labourers and professional craftsmen

The scale of the work force can be partially reconstructed from the number of Franks killed, executed, and taken captive. The figures below come from one Muslim source that was quoted by later Muslim chroniclers. The information regarding the labourers and the garrison should thus be used cautiously. Seven hundred Frankish captives were taken,[56] and almost one thousand men were thrown into the water cistern. The fighting force numbered eighty knights and their squires, and fifteen high ranking infantry officers each of whom commanded fifty men. In addition, there is a list of the professional craftsmen, builders, carpenters, blacksmiths, sword sharpeners (*ṣayqal wa-suyūf*) and various weapon manufacturers (*ṣunnāʿ anwāʿ al-asliḥa*). There were also about a hundred Muslim captives.[57]

The total number of men on the site varied between 1500 and 2645. It is more than likely that during the first months, while the army was at the site, its men participated in the construction work, loading and doing every and any job that did not require specific skills and experience.[58]

## What type of fortress was Jacob's Ford?

Once the entire circumference of the fortress, three posterns, main gate, one tower and the long vaulted hall were exposed, the question of the type of fortress we excavated could be addressed. The plan we held at this stage led Professor Ellenblum to the conclusion that Jacob's Ford was planned as a concentric fortress with two lines of defence walls, an inner courtyard that matched that of Crac des Chevaliers, and an outer ward that would have incorporated towers. The narrow posterns served as passages between the inner and outer bailey.[59] The external defence wall had not yet been built and it would have taken at least another year to complete it and the fortress. The short distance between the tel and the river would have made it difficult, but not impossible, to build a second wall in the east. Since the site has no natural defences, a second curtain wall would have increased the fortress' ability to defend itself.

Although a number of concentric fortresses already existed,[60] Jacob's Ford was probably the first and only fortress planned as a concentric fortress and built as one from its inception, in one phase. A second possibility is that the fortress was

56 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:37, 44.

57 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:43.

58 Almost 500 builders were employed at Mt. Tabor, while men from al-ʿĀdil's army guarded the site and carried out various construction work. al-Maqrīzī, *Kitāb al-sulūk*, vol. 1, part 1: 176; Ibn Wāṣil, *Mufarrij*, vol. 3: 212; Ellenblum, Frontier activities, 93.

59 Ellenblum, *Crusader Castles*, 269–270. For the advantages and development of concentric fortresses see Pringle, D. Introduction and Notes. In T. E. Lawrence *Crusader Castles* (Oxford, 1988); Kennedy, *Crusader Castles*, 60–61, 145–162, 124–126; Ellenblum, *Crusader Castles*, 236–237, 239–257; Boas, *Military Orders*, 123–126, 130–131.

60 Benvenisti, M. *The Crusaders in the Holy Land* (Jerusalem, 1976), 298–300 refers to it as "castrum within a castrum"; Prawer, J. *The Crusaders, A Colonial Society* (Jerusalem, 1985), 376–380; Pringle, Introduction and notes; Kennedy, *Crusader Castles*, 58–61; Marshal, C. *Warfare in the Latin East, 1192–1291* (Cambridge, 1996), 100–101; Boas, *Military Orders*, 122–125; Ellenblum, *Crusader Castles*, 236–257.

only meant to have one line of defence, i.e., one curtain wall. The three (possibly four) posterns incorporated into the wall were meant to be passages into towers that were never built.[61]

## What we did not find or…what the Templars never built

Every season, our team made a list of what we wanted to find. This included the blueprint of the fortress in an old wooden trunk, a full suit of armour, a long inscription carved in stone, a bow, swords… it was quite a long list. We all wanted to find and excavate the water cistern. According to Abū Shāma, who does not give the source he is quoting, at the end of the siege, Saladin's men threw the dead bodies of approximately a thousand Franks into the water cistern.[62] This description is repeated by Ibn Wāṣil (d. 1298).[63] Al-Maqrīzī (d. 1442) writes that the well inside the fortress was blocked (*wa-sudda al-biʾr*),[64] and adds nothing more. The idea behind this act was to contaminate the sole water source inside the fortress and prevent the Franks from returning and rebuilding the site.

Various ground-penetrating radar techniques were used to locate this cistern, but it was never found. A large, well-built, almost square open reservoir (3.6 x 3.8 m) was excavated east of the mosque (Fig. 4.54). It was dated to the Hellenistic period. The walls were wide (1.2–1.3 m and 0.7 m); patches of plaster could still be seen in several places. The pool was filled with medium-sized basalt stones and boulders; it did not include stone blocks from the fortress. The vast majority of the pottery was Hellenistic, with a few medieval sherds and one medieval arrowhead from the battle. The pool was excavated to a depth of 3 m; its floor, however, was never reached. While the material may not date the pool accurately, its orientation fits that of the Hellenistic structure.[65] It seems the pool was filled with earth and stones long before the Templars began the construction of the fortress. Further excavation of this reservoir until the floor may reveal more information. The only other clue regarding the existence of a water installation on the site was the large quantity of *Antiliyyah* clay jars (Fig. 14.12:1-3), found in the southeast corner of the fortress next to the oven. *Antiliyyah* jars have a very particular form: a long neck with no handles, a pear-shaped body and a rounded base.[66] Their location near the oven was difficult to explain. Regarding the construction of a well, it could have provided water within the fortress only if the ground water is at a reasonably high level.[67] Along the eastern slope of the tel, there are patches with common reeds (*Phragmites australis)* and blackberry *(Rubus)* bushes, indicating that there is a small spring and/or high ground water there (Fig. 4.8).

Perhaps the location of the fortress on the bank of the Jordan River allowed the Templars to

61 Boas, *Military Orders*, 258.
62 Abū Shāma, quoting "another book"—*wa-fī kitāb akhir*. See Abū Shāma, *Kitāb al-rawḍatayn* vol. 3: 43.
63 Ibn Wāṣil, *Mufarrij* vol. 3: 82.
64 al-Maqrīzī, *Kitāb al-sulūk*, vol. 1, part 1: 67.
65 See Sabar, R. The Galilee during the Hellenistic Period (4th-1st c. BCE): Geopolitical Changes in Light of the Settlement History and the Fortified Sites. PhD Dissertation. The Hebrew University of Jerusalem (2023).
66 Boas, *Archaeology of the Military Orders*, 157.
67 Personal communications, Professor Amotz Agnon, The Freddy & Nadine Herman Institute of Earth Sciences, The Hebrew University of Jerusalem, Israel.

postpone the construction of the water cisterns or a well to a later stage. Although the source was outside the fortress, it was abundant; water could be drawn from the river and brought to the kitchen for cooking and drinking. Men could wash and draught animals could be brought to the river. If the cisterns were to be filled from the surface runoff of courtyards and the roofs of buildings, then they could not be filled until the structures were completed. Perhaps more advanced technology and further excavations will reveal the missing water cistern.

Several sources mention the taking of the *bāshūra*,[68] a term that can mean barbican, bastion, or gate.[69] The only aspect common to all three is that they are all part of the outer defence of a fortress. The soundings we conducted south of the main gate did not reveal a large, fenced enclosure (حوش *khawsh*) outside the fortress, nor a bastion or a formidable gate. Regarding the towers (in the plural, الابرجة *al-abrija*), that came crashing down when Saladin's sappers completed their work,[70] the formidable solid tower, perhaps a keep[71] and the moat (خندق *khandaq*) into which the commander of the castle leapt[72]—none of the structures we uncovered could be attributed to the buildings mentioned in the sources. Pococke, who visited the site in the first half of the eighteenth century, writes: "There are some signs of a *suburbs, to the south, on a lower ground, which seems to have been fortified*. This place is now called Kaifar-aterah, or Geser-aterah…"[73]

The most suitable location for a keep would have been the northern edge of the fortress where the ground is slightly elevated. Although numerous collapsed stones were found, they all appear to have belonged to the upper courses of the wall that was destroyed in the 1202 earthquake.

Large earth moving equipment used by the Israeli army further damaged the site. It is quite plausible, however, that the contemporary sources are not as reliable or accurate as we would like to believe; or as Richards had phrased it: "Descriptions of battles and sieges may sometimes appear rather repetitive, and as in most medieval texts, rather schematic and lacking in specificity."[74] The discrepancy between the contemporary sources and archaeological finds is difficult to bridge. Sources in various ancient languages have left archaeologists standing in the field with the text of a dramatic written description in their hands, comparing it to what they have just excavated. Some have spent a lifetime searching, turning over every stone, sifting every bucket of earth, looking for a building or an object that received a very detailed, or a very foggy, description. While some have found what they were looking for, at Jacob's Ford we are still searching for our water cistern.

---

68 Ibn al-Athīr, ʿIzz al-Dīn ʿAlī, *al-Kāmil fī'l-Ta'rīkh*. Ed. C. J. Tornberg (Beirut, 1966),
vol. 11:456; Ibn al-Athīr, *The Chronicle of Ibn al- Athīr for the Crusading Period from Al-Kāmil fi'l-Ta'rīkh*. Tran. D. S. Richards, (Aldershot, Hampshire, U.K., 2007), 2: 265; Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:36.

69 Barbican: an outer defence of a fortress. Bastion: a projecting part of the fortification.

70 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:44.

71 ʿImād al-Dīn, quoted by Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:36.

72 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:44.

73 Pococke, R. *A Description of the East, and Some Other Countries* (London, 1843), vol. II: 73.

74 Baha al-Din Ibn Shaddad, *The Rare and Excellent History of Saladin*. Translated by D. Richards (Aldershot U. K., 2001), 6.

CHAPTER 5

# THE SIEGE AND CLOSE-QUARTER COMBAT INSIDE THE FORTRESS

The siege at Jacob's Ford is documented only in Arabic primary sources. William of Tyre writes a few details regarding the reinforcement that gathered in Tiberias but gives no further information.[1] The account was copied and repeated in the common tradition of contemporary medieval Muslim historians and is still mentioned by late fourteenth-century Mamluk chronicles who focussed on the history of the Ayyubid sultanate. The siege of the fortress can, in part, be recreated from the excavated finds, as can the battle that took place inside the fortress itself. The written accounts will be examined and compared to the archaeological evidence. While for some sites this is a simple exercise,[2] at Jacob's Ford the written accounts do not always fit neatly with what we unearthed.

## The primary sources describing the battle

Our earliest description was written by Saladin's secretary (*kātib*), ʿImād al-Dīn al-Iṣfāhānī (d. 1201), in a book titled *al-Barq al-Shāmī*. His account is repeated and quoted by Abū Shāma (d.1267), Ibn Abī Ṭayy, Ibn al-Athīr (d. 1233), Sibṭ ibn al-Jawzī (d. 1256), Ibn al-ʿAdīm (d.1262), Ibn Wāṣil (d. 1298) and others.[3] New information surfaces occasionally in considerably later accounts. In some instances it seems "the initial or continued ignorance of others is often revealed through what are evident additions, containing obvious mistakes or misinterpretations to the original account they were provided."[4] Putting the material into order, figuring out what happened when, and which version is most faithful to actual events, is often a challenging assignment.

Starting from 1175, ʿImād al-Dīn accompanied Saladin on all his campaigns. His account of the siege at Bayt al-Aḥzān (Jacob's Ford) is therefore regarded as that of an eyewitness. He clearly

1 William of Tyre. *The Deeds Done Beyond the Sea.* Trans. E. A. Babcock and A. C. Krey (New York, 1976), vol. 2: 443–444.

2 Raphael, K. and Tepper, Y. The Archaeological Evidence from the Mamluk Siege of Arsuf. *Mamluk Studies Review* 9/1 (2005): 85–100; Amitai, R. The Conquest of Arsuf by Baybars: Political and Military Aspects. *Mamluk Studies Review* 9/1 (2005): 61–84; Boas, A. Archaeological Evidence for the Siege of 1271. In A. J. Boas and R. G. Khamisy (eds.) *Montfort* (Leiden and Boston, 2017), 49–55.

3 Gibb, H.A.R. *al-Barq al-Shāmī*: *the history of Saladin by the Kātib* ʿImād *ad-Dīn al-Isfahānī*. Wiener Zeitschrift für die Kunde des Morgenlandes, lii (1953), 93–115.

4 Fulton, M. S. *Siege Warfare during the Crusades* (Yorkshire and Philadelphia, 2019), 137.

sees himself as part of the military and the description is written in the plural. According to Gibb, his work is "a professional diary or record of the author's secretarial activities, copiously illustrated with copies of or extracts from his own dispatches, his semi-private correspondence with the Qadi al-Fadil"[5] and other sources. His descriptions, according to some historians, may have been drawn from the archives and chancery documents.[6] Although the finds and sources are substantial and detailed, one sometimes has a feeling that the siege is "a stereotyped model of a typical encounter, rather than a precise report."[7] Of all the contemporary works, that written by Abū Shāma is the most outstanding, as he literally collected every shred of information he could lay his hands on. His book, *Kitāb al-Rawḍatayn*, incorporates the description of the siege according to the work of ʿImād al-Dīn, the letters of al-Qāḍī al-Fāḍil who was Saladin's counsellor and secretary, and a number of other sources, the names and titles of which he does not give.[8] It is the longest and most detailed account that exists; he was either a very thorough scholar or had a special interest in this particular event. Abū Shāma presents several versions of the siege.

## Collection of intelligence

Even a siege on an unfinished fortress, located a day and a half's ride from one's capital, requires planning. The preparation for the siege begun with the collection of intelligence on the fortress and its surrounding.

> "*The Franks had built an impregnable fortress near Banias at Jacob's House (Bayt Yaʿqūb), blessings be upon him, at a place known as the Ford of Sorrow. When Saladin heard of this he went from Damascus to Banias, camped there and raided the lands of the Franks. He then moved to the fortress and surrounded it to collect information, so that when his forces regrouped, he could return to it.*"

كان الفرنج قد بنوا حصنا منيعا يقارب بانياس عند بيت يعقوب عليه السلام بمكان يعرف بمخاضة الاحزان فلما سمع صلاح الدين بذلك سار من دمشق الى بانياس واقام بها, وبث الغارات على بلاد الفرنج ثم سار الى الحصن وحصره ليخبره ثم يعود اليه عند اجتماع العساكر.[9]

Saladin attacked the fortress during this first visit (Spring 1179). The Franks held their ground, and Saladin left the site. Preparations for the siege continued only after Saladin's offer to purchase the fortress was rejected.[10] A small scouting expedition set out to study the site and its surroundings.[11]

When Saladin arrived in August (1179) he knew the topography, the composition of the garrison, and the plan of the fortress. One must bear in

5 Gibb, H.A.R. The Arabic Sources for the Life of Saladin. *Speculum* XXV (1950): 60.

6 Massé, H. ʿImād al-Dīn. In: P. Bearman, Th. Bianquis, C. E. Bosworth, E. van Donzel, W. P. Heinrichs (eds.) *Encyclopaedia of Islam, Second Edition*. Consulted online http://dx.doi.org/10.1163/1573–3912_islam_SIM_3546.

7 Marshall, C. *Warfare in the Latin East 1192–1291* (Cambridge, 1996), 212.

8 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl. *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997, vol. 3: 43; Brockelmann, C. and Cahen, Cl. "al-Ḳāḍī al-Fāḍil." In: P. Bearman, Th. Bianquis, C. E. Bosworth, E. van Donzel, W. P. Heinrichs (eds.) *Encyclopaedia of Islam, Second Edition*. http://dx.doi.org/10.1163/1573–3912_islam_SIM_3757.

9 Ibn al-Athīr, ʿIzz al-Dīn ʿAlī. *al-Kāmil fī'l-Ta'rīkh*. Ed. C. J. Tornberg (Beirut, 1966), vol. 11: 455.

10 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:26.

11 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:19–20.

mind that our battleground is best described as a large construction site. For although much of the defence wall was built, work on the fortress was far from completed. The intelligence collected by the Muslims allowed them to pull off one of the oldest tricks of warfare: a surprise attack. Our excavations revealed the tools of the Frankish construction workers at the main gate and the eastern postern, dropped in haste when the assault began. They were found in a thick burnt layer which numerous arrow-heads.

## The composition of Saladin's force

From the very beginning, when Saladin was first notified of the construction of the fortress at Jacob's Ford, he himself planned, led, and executed this campaign. His high ranking amirs, ʿIzz al-Dīn, Nāṣir al-Dīn Muḥammad, Taqī al-Dīn and ʿIzz al-Dīn Jawālī al-Asadī were consulted, and when needed, offered the sultan alternative solutions.

The army Saladin brought with him was composed of cavalry (*khayyāla*), infantry (*rajjāla*), mounted Turkman, sappers (*naqqābīn*) and teams who could assemble and operate siege machines (*majanīqāt*).[12] While the number of dead Franks and captives is very detailed, none of the sources give the precise number of the Muslim force. Although time was a commodity in short supply, decisions were carefully weighed and examined before they were carried out, and mistakes were corrected as quickly as possible. The Muslim preparations, their choice of equipment and men, provided them with a certain amount of flexibility and an ability to change and/or adjust their manoeuvres; this gave them a considerable advantage.

Jim Bradbury, who researched the history and development of medieval siege warfare, describes eight phases of siege warfare: (1) suborning or subverting key defenders, (2) psychological intimidation of the garrisons by shouting, cursing and by other means, (3) executing prisoners in front of the walls, (4) cutting off supplies to the fortress, (5) sapping the walls, (6) starving the garrison, (7) hurling stones and bombarding the besieged, and (8) storming the defences.[13] A similar list is provided by Marshall, who focused on the military history of the second half of the Crusader Kingdom (1192–1291).[14] Saladin only used two of the items on Bradbury's list.

12 I would like to thank Mr. Said Abbas of Nahf who translated parts of ʿImād al-Dīn's work; ʿImād al-Dīn, al-Isfahani. *Sana l-Barqu al-shami* (Riyadh, 1989): 168; Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:36.

13 Bradbury, J. *The Medieval Siege* (Woodbridge U. K., 1992), 72–73, 79–88; Bachrach, B. S. Medieval Siege Warfare: A Reconnaissance. *The Journal of Military History*. 58/1 (1994): 125.

14 Marshall, *Warfare*, 212–213.

## The siege

The following is an attempt to reconstruct the time-line of the siege.

**Day 1**

Saladin's initial idea was to bombard the walls of the fortress with siege machines. When the Sultan arrived at the ford he set up camp near the fortress,[15] and organized an expedition to Safed (800 m asl, c. 35km) where the Templars already held a modest fortress. The men who were sent to Safed brought vines and built a woven wall of branches to provide the teams and siege machines with protection, perhaps against the archers.

The expedition returned to the camp at Jacob's Ford in the afternoon. The initial plan, however, was replaced when one of Saladin's amirs reassessed the site and the schedule. The Sultan "gathered his officers and consulted them (compared their opinions to his). Izz al-Din Jawli al-Asadi told him: let us move forward with our force and meet the enemy, before you construct the siege machines, so that we can taste and experience the fight against them."

وجمع امراءه وعارض بآرئهم آراءه فقال عز الدين جاولى الاسدى تاذن لنا فى الزحف قبل نصب اللمنجنيق حتى ندوق قتالهم ونجرب نزالهم.[16]

All the sources are clear regarding the siege machines: they were never used. No catapult stones were found during the excavations or in the surveys in the area surrounding the fortress.

Saladin accepted his officer's suggestion, and the men launched an attacked on the *bāshūra* (barbican). Abū Shāma uses a slightly different term; he writes they attacked the fortress's *ḥawsh* (*hajama ḥawshahu*), i.e., the fortress's enclosed area or courtyard. They killed some Franks and took the penned animals.[17] The attack, according to ʿImād al-Dīn, was not led by the amirs, but rather by a simple courageous fighter. The amirs and the rest of the troops followed him.

> *"The Franks entered the fortress, bolted the gates, and stood behind the merlons [sharāfāt, the first toothed course] at the top of the fortress wall, and they watched from behind the arrow embrasures [sharafātihi] as our men captured the bāshūra, filled it, moved in, and defended it."*

ودخلوا الحصن واغلقوا الابواب ووقفوا وراءها على شرافاته واشرفوا على شرفاته وملك اصحابنا الباشورة وملاوها وانتقلوا بكليتهم اليها وكلأوها.[18]

ʿImād al-Dīn plays with two words that have a similar sound: *sharāfāt* and *sharafāt*,[19] but it seems his rhyme reflects what his eyes saw. The walls of the fortress according to this description were completed.

> *"The Muslims spent the night guarding the [bāshūra], the sultan supplied them with provisions and sent reinforcement, he was careful not to force and open the gates. The Franks attacked them and we were told the Franks torched each gate in order to protect themselves."*

15 ʿImād al-Dīn, *Sana l-Barqu*, 168.
16 ʿImād al-Dīn, *Sanā l-Barqu*, 168–169.
17 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:44.
18 ʿImād al-Dīn, *Sanā l-Barqu*, 169.
19 I would like to thank Dr. Amir Mazor for his translation of all the Arabic texts in this chapter and for his wise and helpful comments and suggestions. This chapter could not have been completed without his knowledge and advice.


**Figure 5.1.** Aerial photo of the fortress. The red semi-circle is the suggested location of the enclosure stormed by Saladin's men on the first day of the siege.

وباتوا طول الليل يحرسون والسلطان يمدهم بالامداد وينجذهم بالانجاد فيشفق من فتح الابواب وكبسهم الناس فقيل لنا انهم وقدوا خلف كل باب نارا ليأمنوا على انفسهم اغترارا ولا يلقوا غوارا .[20]

The *bāshūra* can mean any of the following: barbican, bastion, or gate. We spent a considerable amount of time excavating the southern part of the fortress and the area just south of the main gate outside the fortress. We did not find remains of an external Frankish defence. The main gate at the south is a simple structure that would have of little use in the defence of the fortress. It thus seems that Abū Shāma's description is more accurate and the first area that was taken was an enclosure outside the fortress, where the Templars penned their animals and where some of the men stayed, perhaps to guard the compound. It was not a strong or forbidding structure. This might be why Saladin's commander suggested they try to capture it with their men and not waste time using siege machines. The Franks who survived escaped into the safety of the fortress walls. Next, the fortress gates were torched by the Franks, to prevent the Muslim force from storming the fortress — a quick and somewhat desperate move.

The fortress wall (4.4 m wide) separated the Muslim force, which spent the night guarding the *bāshūra* from the Templar garrison (Figs. 5.1–5.2). Saladin was justly concerned for the safety of his men; the torching the gates, and then the wooden scaffolding, building planks and firewood, could keep the fires burning for several days. A thick burnt layer was found inside the main gate and at the eastern postern. The fire brought the Muslim force to a halt. Scaling the walls would have led to a significant loss of men. It was thus decided to start mining the wall.

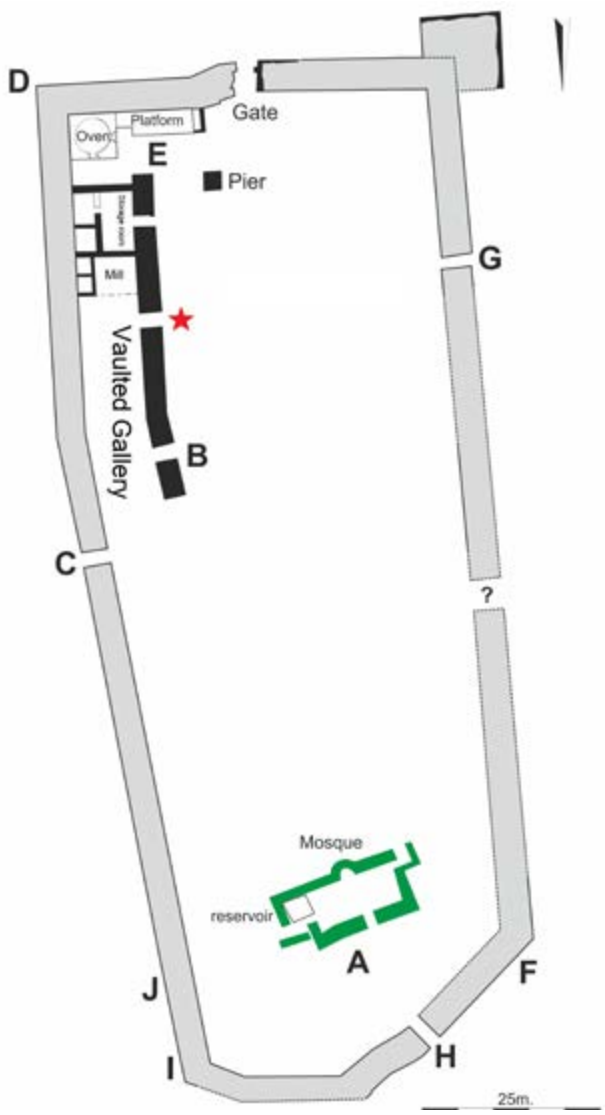



**Figure 5.2.** Plan of the fortress (renewed by Jay Rosenberg).

**Day 2**

The accounts of the second day of the siege are most confusing. No matter which report one reads or how detailed the description, the contradictions keep one busy, checking again and again whether the text or the site, or both, were misunderstood. Eventually, after going over the sources several

20 ʿImād al-Dīn, *Sanā l-Barqu*, 169.

times, and surveying the fortress architecture again and again, one realizes that there are three versions regarding the breaching of the fortress walls and only one fits what was revealed in the excavations.

Mining is an old and well-known siege practice.[21] Although there were no innovations in this field during the period under discussion, there was always room for improvement. Sappers were a specialized unit within the armies. One could not turn archers, mounted men or infantry soldiers into sappers. According to Bachrach, men employed in siege warfare "surely required levels of expertise, training, and cohesion … The combat team operating a battering ram under enemy fire or a catapult crew keeping their weapon in operation day and night certainly had to have obtained training and unit cohesion not inferior to that of modern tank or mortar crews."[22] This is supported by the existing Arabic descriptions of siege warfare, which use precise terminology for the various siege teams.

Perfecting the teams' work, accuracy and speed were a key to the operation's success. The Templar garrison was aware of every step of the drill. If the sapper's tunnel was too short, the scaffolding too weak, or the tunnel too narrow in comparison to the size of the curtain wall or the tower, the operation failed. If the teams' work was too slow, the besieging army risked being trapped between the fortress garrison and fresh reinforcements. The work was dangerous not only because the structure was dug below the foundation and stones could come crashing down on the men,[23] but also because working at the foot of the walls exposed the sappers to the garrison's fire.

*Version 1: Mining the curtain wall.* ʿImād al-Dīn describes the organization of the commanders and work force that dug the tunnels below the curtain wall, with the Franks threatening the sappers from above:

> *"And then the sultan gathered all the high ranking amirs and he divided the work [building the tunnels] between them. ʿIzz al-Dīn Farrakshāh took the southern side, the craftsmen (ṣunnāʿ), the skilled tunnel diggers (naqqābīn) went with him. The sultan began a mining tunnel along the northern side. Nāṣir al-Dīn Muḥammad Ibn Shīrkūh dug next to him. Taqī al-Dīn took another area. Thus, each high ranking amir took a different side, and worked quickly. The Franks above them were throwing small bottles from behind the curtain wall."*

ثم جمع الأمراء والكبراء وفرق عليهم البناء فأخذ عز الدين فرخشاه الجانب القبلى وجمع عليه الصناع النقابين وأخذ السلطان النقب في الجنب الشمالى وأخذ ناصر الدين محمد ابن شيركوه بقربه نقبا وأفرد تقى الدين قسما وكذلك كل كبير شرع فى طرف وأخذ االعمل فيه بسرعة والفرنج من فوقهم على السور وراء الستاير يرمون القوارير[24]

According to ʿImād al-Dīn, the fortress walls were sapped from both the south and the north and at several other points. He also hints that digging the tunnels started on the evening of the first day. The small bottles or vials dropped by the Templars on the sappers were most likely Greek fire (Arabic: *naft*)—thick, conical, clay pots with a short, narrow neck, containing an inflammable liquid and a wick,

21 Fulton, *Siege Warfare*, 137.
22 Bachrach, Medieval Siege, 132–133.
23 Fulton, *Siege Warfare*, 142.
24 ʿImād al-Dīn, *Sanā l-Barqu*, 169.

**Figure 5.3.** Fragments of Greek fire vessels (Area H, L406 B4009).

similar to Molotov cocktails.[25] The term *qawārīr* (قوارير) used by ʿImād al-Dīn for this device is not common. A number of fragments were found during the excavations inside the fortress grounds and at the northwest and eastern posterns (Fig. 5.3). Their findspots, however, suggest they were hurled from the outside by the Muslim forces.

The tunnel was filled with wood and then lit. The fire burnt for two whole days, while the Muslim force awaited the wall's collapse. At a very early stage, ʿImād al-Dīn's description leaves the general scene and focusses on one tunnel. Ibn al-Athīr, too, mentions one tunnel that was dug below the wall, not giving its exact location: "And the following day they dug [below] the fortress and deepened the tunnel."

فلما كان الغد أصبحوا وقد نقبوا الحصن، وعمقوا النقب[26]

*Version 2*: *Mining the Towers.* In two accounts provided by Abū Shāma, both the tower and the wall were mined. Even when he quotes ʿImād al-Dīn, he emphasizes the mining operation was conducted below a well-built tower and that the digging was difficult.[27] In another account, quoting an unnamed author, he writes: "And the fire broke out immediately in the tunnels in all five directions and the towers were fractured."

وفي الحال علقت النقوب على خمس جهات ... وانشقت الابرجة.[28]

*Version 3*: *Mining a single tower (a keep?).* Ibn Wāṣil wrote that they mined the curtain wall and a single, strong tower:

"And when they woke up in the morning, the sultan divided the sides of the tower among his officers. ʿIzz al-Din Farakhshāh Ibn Shāhinshāh Ibn Ayyūb took the southern side, and the sultan took the northern side, and his cousin Nāṣir al-Dīn Ibn Shīrkūh took the digging of a tunnel next to him. Likewise, al-Malik al-Muẓaffar Taqī al-Dīn and every senior amir took a certain part. The tower was well built and it was difficult to dig [below it]."

ولما اصبحوا فرق السلطان جوانب البرج على الأمراء فأخذ عز الدين فرخشاه ابن شاهنشاه بن أيوب الجانب االقبلى وأخذ السلطان الجانب الشمالى وأخذ ابن عمه ناصر الدين بن شيركوه بقربه نقبا وكذلك الملك المظفر تقى الدين وكل كبير في الدولة أخذ قسما وكان البرج محكم البناء فصعب نقبه.[29]

From this point onwards all the sources follow ʿImād al-Dīn's account with few changes. The length of the tunnel is similar in all the accounts:

25 The Franciscan excavation at Mt. Tabor has unearthed over twenty such vessels in the fortress grounds. See: Battista, A. and Bagatti, B. *La Fortezza saracena del Monte Tabor (AH. 609–15: AD. 1212–18)*. (Jerusalem, 1976), 119–142. Ayalon says that "the use of naphtha by the Muslims reached its peak during the period of the Crusades." See: Ayalon, D. *Gunpowder and Firearms in the Mamluk Kingdom*, 2nd ed. (London, 1978), 10–11; Nicolle, D. *Medieval Siege Weapons* (Oxford, 2003), vol. 2:33–39.

26 Ibn al-Athīr, *al-Kāmil fī'l-Ta'rīkh*, vol. 11: 457.

27 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:32.

28 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:44.

29 Ibn Wāṣil, Jamāl al-Dīn Muḥammad b. Sālim. *Mufarrij al-kurūb fī akhbār banī ayyūb*. Ed. G. al-Dīn al-Shayyal (Cairo, 1957), vol. 3:81.

30 cubits long and 3 cubits wide; the fortress wall was 7 cubits wide.[30] On the night of the second day, when the mining tunnel was completed, it was filled with wood, ignited, and left to burn until late the following day. Towards the end of the second day the sultan suspected the mining operation had failed: "the hearts filled with fear and what we assumed should have happened did not take place." والقلوب قد اشفقت والظننون قد اخففقت.[31]

Saladin acted quickly. He gave three hundred Egyptian dinars to ʿIzz al-Din and ordered him to pay one dinar to every man who brought a container of water to extinguish the fire in the tunnel. Once the fire had died out, he sent his men back inside and ordered them to make it deeper.

**Day 3**

The Muslim force managed to enlarge the tunnel, stack it with wood and ignite it once again. Meanwhile, "news arrives from Tiberias that the Frankish cavalry and infantry are gathering,"[32] preparing to come to aid the besieged. The accounts of the sappers' work are an interesting case study regarding the nature and difficulties of military descriptions. One can run a critical comparative analysis, choose the information that is most convincing and reconstruct the siege on that basis.

The archaeological evidence, however, restricts our options. Although we exposed the entire circumference of the walls, we only found one fairly modest tower. The excavations have not yet revealed a keep of any kind. The *bāshūra*, the walled compound, may have been located in the south, next to the main gate, where the terrain is relatively moderate. The excavations did not reveal an enclosed area, but it may have been nothing more than a modest stone fence. The thickest layer of collapse came from the northern section of the fortress. Large stones from the fortress walls were randomly scattered inside at a great depth. The destruction has been attributed to the earthquake of 1202, rather than Saladin's siege. Excavations east of the tower, south of the main gate, below the eastern postern and outside the northwest and northeast segments of the wall did not reveal signs of sapping, fierce fire, or collapse. In all these areas the wall stands sound and solid. While the description of digging the tunnels, the failure of the first attempt, the success of the second and the final fall of the wall all play a prominent place in the siege accounts, we have yet to find archaeological evidence at the site.

**Day 4**

Anxious and thrilled, the Muslim force watched the slow collapse of the wall:

> *"On Thursday morning, the 24th of the month of Rabīʿ I, the furnace heated, and grief bit the lion, and the land was turbulent, and the difficulties grew. We watched the wall, and the wait was long, and expectations delayed. And then when the day began and our patience expired and there was no decision, the wall fell and the righteous were informed. The men ran to the breach in the wall. The Franks who stacked wood behind the breached wall, were struck from every direction by the flames that blew towards them when the wall fell, and the wind*

30 *Dhirāʿ* (ذراع) in Syria = 0.68 m.; in Egypt = 0.58 m, according to Wehr, H. *A Dictionary of Modern Written Arabic*. J. M. Cowan (ed.) 4th edition (Wiesbaden,1994), 356. In Abu Shāma's quotation of ʿImād al-Dīn, the width of the curtain wall is 9 cubits. Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:36.

31 ʿImād al-Dīn, *Sana l-Barqu*, 169.

32 ʿImād al-Dīn, *Sana l-Barqu*, 170.

*fanned the fire. The flames blew towards them and burned the houses close to the wall. So they gathered to the far side away from the fire, but they were scorched by the fire, and they begged [shouted] for safe passage (amān).*"

ولما كان الخميس الرابع والعشرين من شهر ربيع الأول اصبحح اللخميس قد حمى الوطيس وقد عض بالاسد الخيس والدنيا تضطرب والبلوى تضطرم ونحن ننظر الى السور وقد طال الانتظار ووقع من بطء وقوعه الاستشعار ولما تعالى النهار وعيل الاصطبار وزال القرار انقض الجدار وتباشر الابرار وتسابق الناس الى الثلمة وكان الفرنج قد جمعوا وراء الواقع حطبا فلما وقع الجدار دخلت الرياح فيها فعادت عليهم النار واحرقت البيوت الدانية منها في الجوانب وبلوا من كل صوب بالمصايب فاجتمعوا الى الجانب البعيد من النار وقد لفحهم وهج الاستعار وصاحوا بالأمان[33]

Ignoring the request for safe passage, the Muslim force entered the fortress grounds and close-quarter combat began. Over a thousand arrowheads were found during the excavations. Six skeletons that probably belonged to members of the Templar garrison and/or the labourers were found below the collapsed barrel vault. Four skeletons were found outside the vault discarded in a pile, together with a number of pig remains. A pile of equid skeletons was found below the debris on the kitchen floor. It was as near to a medieval battle scene as a team of archaeologists can be.[34]

Saladin then ordered the destruction of the fortress and the restoration of the sacred shrine dedicated to the patriarch Jacob:

"I will not leave until I raze this site to the ground and restore hope of demolishing it. We divided the fortress into segments and we destroyed each part accordingly. The tomb of Jacob resumed its role as a pilgrimage site and I witnessed the joy of those who visited it."[35]

## The days following the siege

### Weapons and booty

According to an anonymous source quoted by Abū Shāma, sword sharpeners and armourers who made all kinds of weapons were among the craftsmen Saladin captured:

وصيقل وسيوفي وصناع انواع الاسلحة.[36]

While arrowheads were a common find and hundreds were collected every season (see below), as far as weapons were concerned, Saladin left nothing behind for us to find, other than one impressive mace head and one spearhead (Figs. 5.4–5.6). The fortress grounds were picked clean. Livestock, horses, horse tack, armour, and every type of weapon were collected and taken back to Damascus. The details concerning the vast amount of booty are provided mainly by Abū Shāma: "They pillaged 100,000 of iron weapons of various types."

وغنموا مئة الف قطعة من الحديد من جميع انواع الاسلحة.[37]

"And in the [fortress] there were approximately1000 suits of armour."

---

33 ʿImād al-Dīn, *Sana l-Barqu*, 170.

34 Mitchell, P.D., Nagar, Y. and Ellenblum, R. Weapon Injuries in the 12th Century Crusader Garrison of Vadum Iacob Castle, Galilee. *International Journal of Osteoarchaeology* 16 (2006): 145–155. We assumed that Saladin collected his dead and brought them home to be buried.

35 ʿImād al-Dīn, *Sana l-Barqu*,170.

36 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:37.

37 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:37.

وكان فيه نحو الف زردية.[38]

The Templars had stocked and armed their fortress, preparing themselves for a long, active period at the edge of the kingdom. The quantity of booty recorded is impressive. The numbers appear exaggerated, in relation to the captives taken and the number of casualties, but even if the amount was smaller it seems the armoury of Jacob's Ford was well provisioned and in good order. According to David Nicolle, the Franks "adopted ideas and items of equipment from their Islamic foes…"[39] The knights of the military orders were trained in every form of combat and their arsenals supplied both armour and a variety of weapons, including bows and crossbows. The latter were looked after by the arbalestry and supervised by the grand commander.[40]

**Figure 5.4.** Mace head found in front of the southwestern postern (Area G, photo by Bouky Boaz).

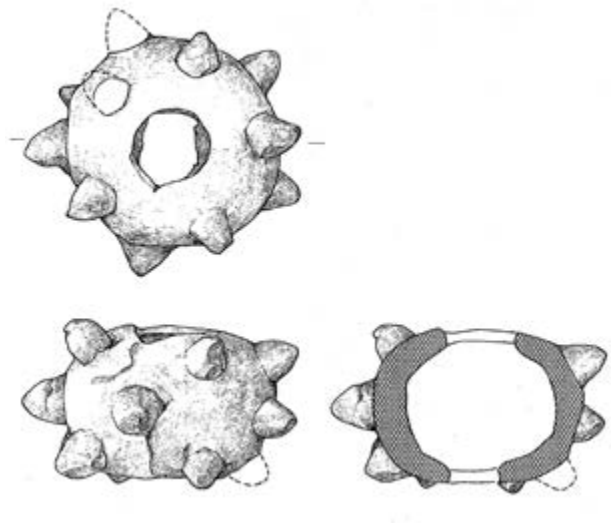


**Figure 5.5.** Drawing of the iron mace head found in front of the southwestern postern (Area G).

**Captives**

In Abū Shāma's account, the passage concerning the captives begins with a vivid description of the removal of the shackles from the feet of about 100 Muslim prisoners who had worked on the construction of the fortress and their transfer to the ankles of the new Frankish captives.[41] There was a clear and almost set routine regarding prisoners. Simple, low-ranking soldiers were taken prisoner and sold for whatever sum they could fetch. Skilled craftsmen were always sought after and handled carefully. While the Crusaders arrived in the Holy Land with a clear idea of the fate of Muslim prisoners, their attitude and practice eventually changed, and they adopted and adapted the local customs and rules that were practiced by both the Muslims and the Christian leaders of the Byzantine Empire and the Armenian Kingdom.[42] Knights and high ranking members of the nobility were taken prisoner

38 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:37.

39 Nicolle, D. *Arms and Armour of the Crusading Era, 1050–1350. Islam, Eastern Europe and Asia.* 2nd ed. (London and Mechanicsburg, Pennsylvania, 1999), 274.

40 Boas, *Military Orders*, 10.

41 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 43.

42 Friedman, Y. Violence toward Captives in the Latin East. *Historia: Journal of the Historical Society of Israel* 11 (2003): 21.

**Figure 5.6.** Spear head (Area E, L104, 2005 Season)

and stayed in captivity until they were ransomed. In some cases, members of military orders were executed on the site together with groups or individuals who had fought well.

At Jacob's Ford Saladin acted in accordance with accepted conventions: he executed the archers and the renegades (those who converted to Christianity or the Muslims who fought on the Templars side; the term used is equivocal). Their numbers are not provided.[43] He gathered 700 captives, of which 80 were Templar knights who could be ransomed for a high price. He also took the craftsmen: "artisans that included builders, architects, blacksmiths, carpenters, sword sharpeners, sword makers and producers of various weapons."

الصناع مابين بناء ومعمار وحداد ونجار وصيقل وسيوفقي وصناع انواع الأسلحة.[44]

## Arrowheads: Muslim versus Templar archers at Jacob's Ford

The archers are scarcely mentioned in the sources. The excavations, however, brought the archers into the centre of events. Arrowheads were found throughout the fortress grounds, outside at the foot of the walls, and in the survey of the quarries.

In the 1994 season, when we excavated the eastern postern, we retrieved over 240 arrowheads from a thick burnt layer. They were also found in a pile of mortar next to labourers' tools: a hoe, a pick, an adze, and a spade. One morning during the excavation, when the yell for breakfast was sounded and the volunteers left to eat, Adrian Boas and I sat and took some notes.[45] After a few minutes of silence, Adrian turned and asked: "Do you hear them?" I lifted my head from my notebook: looked at Adrian and returned the question "Hear what?" Adrian answered in all seriousness: "Can't you hear the arrows whistling?" It was not difficult to visualize the archers and hear arrows flying all around us.

The evidence inside the fortress suggests that the bow, which is usually regarded as a long distance weapon, was also fired point blank, almost like a pistol. One of the most gruesome pictures of death was that of a man cornered in the kitchen and shot at from a very short distance. We found him lying on his back with his arm raised above his head. Three arrowheads were uncovered next to his neck vertebrae. When the vault collapsed a large basalt slab fell and divided his upper and lower torso (Fig.5.7).

---

43 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:37.

44 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:43.

45 Adrian Boas, Professor (now Emeritus) of Medieval Archaeology at Haifa University's Department of Archaeology, lead the archaeological team at Jacob's Ford between 1994 and 1997.

**Figure 5.7.** Skeleton of a man cornered in the kitchen and found with arrowheads imbedded in his neck. Season 1997, Area E, L929, B9062 (photo by Eran Aleph).

A second skeleton was found at the northern opening of the large oven, in a layer of ash next to the skull of an equid (Season 1997, Area E, L930, B9064). The man had an arrowhead embedded in his pelvis. A number of equids were trapped inside the kitchen, a flat kite-shaped arrow was found in the hindquarters of one of them, whose head lay inside a small niche. In the northern part of the fortress, a skeleton of a pig was excavated in a layer of ash with numerous arrows around it. The scene inside the fortress after the wall was breached gradually became clear. In the heat of the last days of August, when temperatures in the Jordan Valley rarely drop below 35 °C, fire and smoke engulfed the fortress, terrified horses, mules, donkeys and pigs scrambled and brayed in panic, arrows whistled, and the battle cries of hundreds of men cut through the air.

The following pages are an attempt to reconstruct the role of archers within the Templar garrison and among Saladin's forces, and to define the bow types used by the Frankish and Muslim forces, according to the arrows found at the fortress. In addition to the historical sources that describe the siege, the distribution of arrowheads around the site may further add to our understanding of the events that took place.

Foot and mounted archers were the mainstay of medieval Muslim armies throughout the Middle East; archers in West European armies during the twelfth and thirteenth centuries do not appear to have played the same role. In Europe archers were occasionally presented as cowards; bows were

seldom used by the nobility, outside hunting, and it was mainly the peasants and mercenaries that used bows on the battlefield.[46] Although their importance and rank gradually changed, they scarcely held the high social status or received the respect that was bestowed upon Muslim mounted archers in the Ayyubid and Mamluk armies. It seems that matters developed differently in the Crusader Kingdom, especially in the defence of fortresses, where archers played a prominent part.[47] And yet even amongst the Frankish armies in the Levant, archers never seem to have matched the skills displayed by mounted archers in the Ayyubid and Mamluk armies.

## The arrowheads and their distribution within and around the Fortress grounds

Over a thousand arrowheads were found on the site. Were they shot by Frankish archers who defended the fortress, or by Saladin's archers? What type of bows were those arrows shot from? Was it the traditional composite bow that was used throughout the Middle East, a crossbow, or a simple, wooden, short bow, similar to those depicted on the Bayeux tapestry?

The Arabic sources consulted in this study are mainly war manuals, written for mounted and foot archers and master craftsman who made bows and arrows. They supply the reader with detailed information on exercises and training methods, types of bows and arrows, and the length and weights of the shafts and the feathers. In short, they cover almost every aspect that a fighting archer, an amateur hunter, or a fine craftsman would have needed.

*Essential Archery for the Fighting Archer* was a book written in 1368 by the Mamluk author Taybughā al-Ashrafī al-Yūnanī. Sadly, the manual does not give any information about the author. It is obvious from the contents that he was a professional archer himself and that most of his advice comes from his own experience on the battlefield.[48]

*The Book on the Excellence of the Bow and Arrow* was written during the fifteenth century. It is considered to be one of the most thorough studies of the composite bow.[49] Its author was born in Morocco, but that is all we know. Concerning Crusader-period Latin sources, we have no war manuals similar to those mentioned above. Although these Muslim war manuals were written long after the Crusader kingdom had fallen, the descriptions of the arrowheads in both match the arrowheads found on the site. The arrowhead industry had hardly changed since the twelfth century.

Throughout the Middle Ages, the structure and thickness of armour determined the quality of the metal, shape, weight, and length of arrowheads. All the arrowheads found at the site were made of iron.[50]

---

46 Bradbury, J. *The Medieval Archer* (Bury St. Edmunds, Suffolk, 1998), 2–3.

47 Raphael, *Archers in the Crusader Kingdom*. M. A. Thesis. Hebrew University of Jerusalem 2001, [Hebrew].

48 Taybughā l-Ashrafī l-Yūnanī. *Toiler Kitab Ghunyat at-tullab fi ma'rifat ramy an-nushab (Essential Archery for the Fighting Archer) Saracen Archery*: *an English Version and Exposition of a Mameluke Work on Archery (ca. A.D. 1368).* Trans. and eds. J. D. Latham and W. F. Paterson (London, 1979).

49 Unknown Author. *Arab Archery: an Arabic Manuscript of about A.D. 1500*: *A book on the Excellence of the Bow and Arrow.* Trans. and eds. N. A. Faris and R. P. Elmer (Princeton, 1954).

50 Since the site is located in an area that has high rainfall during the winter and high humidity in the summer — conditions that encourage corrosion in iron artefacts — most are in a rather poor state of preservation. Some are cracked and others are broken

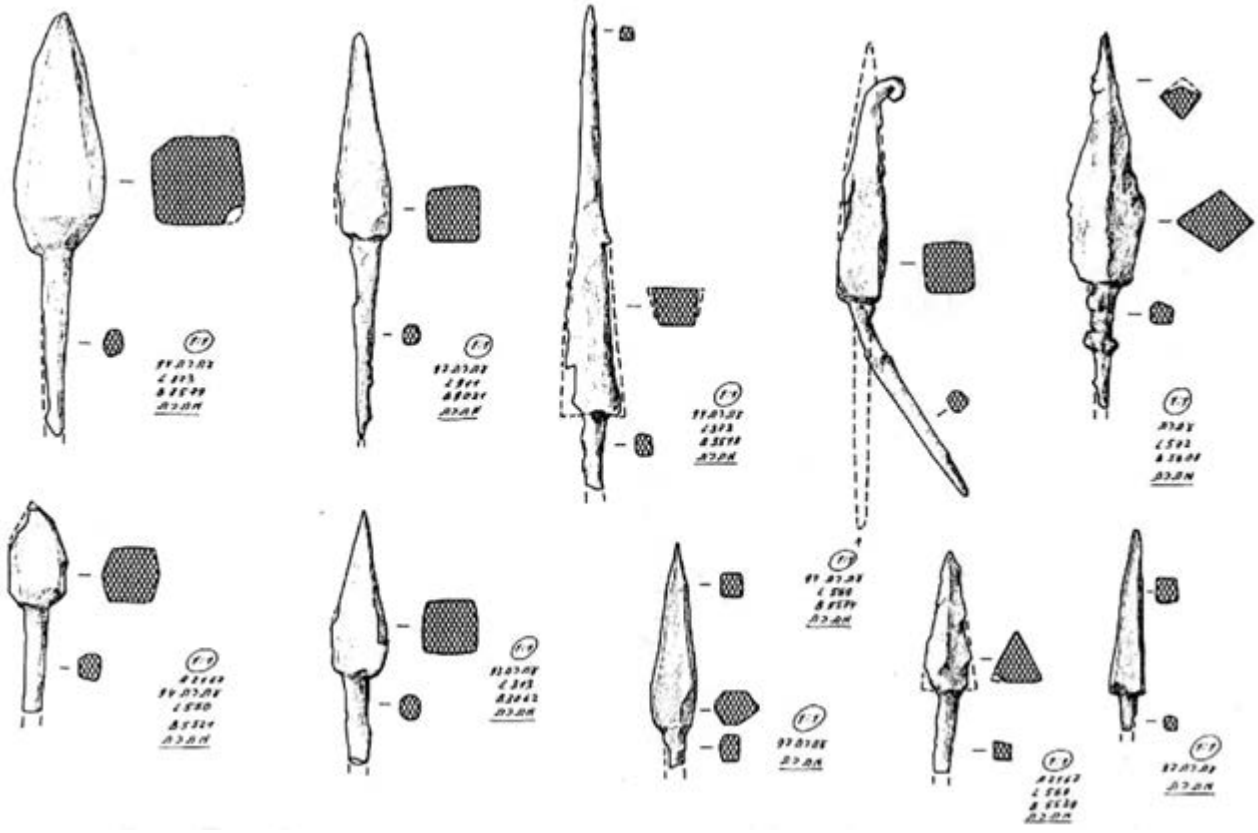


**Figure 5.8.** Drawings of tanged arrowheads.

**Figure 5.9.** Tanged arrowheads found inside the fortress (photo by Bouky Boaz).

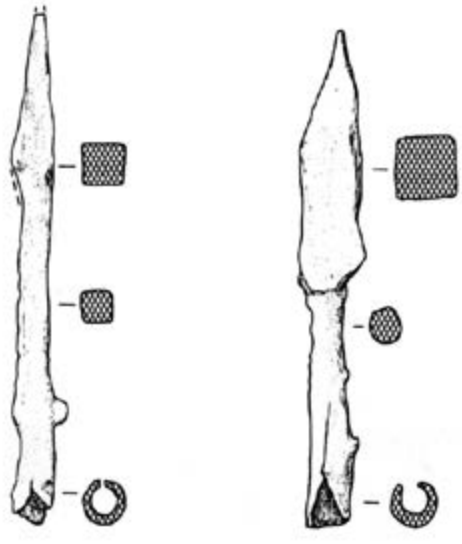


**Figure 5.10.** Socketed arrowhead.

**Figure 5.11.** Socketed arrowheads (photo by Bouky Boaz).

Apart from six, they were all designed to penetrate armour. Most have a square, triangular or diamond section and a sharp, pointed edge (Figs. 5.8–5.9). Arrows were connected to the shaft by either a tang (Figs. 5.8–5.9) or a socket. Only eighteen arrowheads with sockets were found at the site (Fig. 5.10).

The weight of the tanged arrowheads averages 15 gr. and their length ranges 5–7 cm. They were probably fired from composite bows. The socketed arrowheads are heavier and longer, their weight ranging 19–34 gr. and their length 6.5–10.5 cm. They require a strong bow with a powerful draw, and it seems they were less suitable for distant targets. They were likely fired from crossbows.

The anonymous author of *The Book on the Excellence of the Bow and Arrow* mentions four different shapes of arrowheads: those with square, triangular, round or dome-shaped sections. All these types have tangs and are designed, according to the source, to penetrate helmets, body armour and shields.[51] It seems that amongst the Muslim archers who used both composite bows and crossbows, tanged arrowheads were more common than socketed ones. He further explains the faults of socketed arrows, which often tend to break when they hit a hard surface such as a shield, as they do not seem to be able to withstand the impact of the blow.

Socketed arrowheads are rare not only at Jacob's Ford, but also at other Frankish sites within the borders of the Crusader Kingdom of Jerusalem. In Europe, on the other hand, they are very common and can be found at medieval sites in France that date from the eleventh to the thirteenth centuries.[52] Since the composite bow was not used in western Europe, those arrowheads could have only been shot from a crossbow or a simple, short-staved, wooden bow. Due to their scarcity in the Levant in general, and at Jacob's Ford in particular, it seems more than likely that the archers employed at Jacob's Ford used composite bows similar to those used by Saladin's archers. It is difficult to draw wider conclusions, but the general picture that emerges is that the Franks used the composite bow during their reign in the East.

The third and most interesting type found at the site is the kite-shaped arrowhead. They were fitted to the shaft with a socket and a tang, in order to secure the shaft to the arrowhead. This type was used mainly to injure horses (Fig.5.12), as they were designed to penetrate deep into the horse's

and badly corroded.

51 Anonymous Author, *Arab Archery*, 107–108.

52 Zadora-Rio, E. L'enceinte fortifiée du Plessis Grimoult (Calvados) contribution a l'étude historique et archeologique de l'habitat seigneurial au XI siècle. *Archéologie Medievale*, III–IV (1973–1974), 5–111; Ribot, H. Les fouilles du castrum de Saint Madeleine. *Archéologie Medievale* 15 (1985): 103–157; Colardelle, R. and Colardelle, M. L'habitat médiéval immergé de Colletière, à Charavines (Isère). Premier bilan des fouilles. *Archéologie Médiévale* 10 (1980): 167–269; Serdon, V. *Armes du Diable*: *Arcs et Arbalètes au Moyen Âge* (Rennes, 2005).

**Figure 5.12.** Kite-shaped arrowhead, used against horses (photo by Bouky Boaz).

flesh. Their origin is in the Eurasian steppe.[53] They served for hunting but were found to be a great value against horses in times of war.

Although those arrows did not cause the horse to die at once, the wounded mount soon had its rider dismounted. Once a knight in armour was off his horse, he became easy prey for foot soldiers and mounted men-at-arms. Wounded and lame horses were seldom attended to on the field, and in most cases were left to perish. Many chroniclers of the Crusades, some of whom who were eyewitnesses, describe the loss of horses caused by the Turkish archers.[54]

Equid skeletons were found in the southeast corner of the fortress (Area E),[55] under the debris of the long barrel vault. They were probably trapped in the hall during the battle. When the vault was destroyed it buried the carcasses. The flesh of the animals gradually decayed, leaving the skeletons in a good state of preservation. No equipment, such as bits, stirrups, or saddles, was found on or near the skeletons. Three kite-shaped arrowheads were found beneath one of the skeletons (Figs. 5.13–5.14).

The location of each arrowhead was marked on the site map (Fig. 5.15), with the idea of determining whether an arrow was shot by one of Saladin's archers or by Frankish archers. Arrowheads found outside the main gate on the south and the posterns were probably shot by the Muslims, while arrowheads found at the foot of the walls, close to the gates inside the fortress, and far from the fortress walls near the quarries, were more than likely shot by the Frankish archers who defended the fortress. The distribution map showed that apart from the Muslim forces that attacked from the west and south,[56] a handful of Saladin's archers were camped opposite the eastern postern of the fortress, almost 300 m away (Fig. 5.16). The area in and around the eastern postern (Area C) yielded over two hundred arrowheads. The arrowheads found in the pile of mortar together with tools, suggest that the labourers working on the eastern postern were targeted by Saladin's archers. Perhaps this action was meant to draw the attention of the fortress defenders from

53 Nicolle, *Arms and Armour*, 5.
54 William of Tyre, Book III, Chap. 14, 170–171.
55 The equine skeletal remains were analysed by Dr. Hadas Motro; see Chapter 7.
56 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:36.


**Figure 5.13.** Equid skeleton with kite-shaped arrowhead.


**Figure 5.14.** Equid skeleton on the kitchen floor (Season 1996, Area E, L466).

Saladin's teams that were working on the mining tunnel.

The archers' fate was decided by the Sultan: "Praise be to Allah, Glory be to Him alone, the prisoners who were brought [to the sultan] were questioned by him, and if [the prisoner] was a renegade or an archer, he was beheaded."

وقد حمدالله سبحانه وحده فمن احضر من الاسارى عنده استنطقه فان كان مرتدا او رميا يخرج ضرب عنق.[57]

The fact that Saladin clearly differentiates between the renegades and the archers indicates that the archers were either Franks, local Christians, or perhaps Muslim mercenaries.[58] Their execution was probably ordered due to the havoc and death

57 ʿImād al-Dīn, *Sana l-Barqu*,170. This passage is quoted also in Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 37.

58 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3: 37; Harari, Y. The Military Role of the Frankish Turcopoles: A Reassessment. *Mediterranean Historical Review* 12 (1997): 105–106.

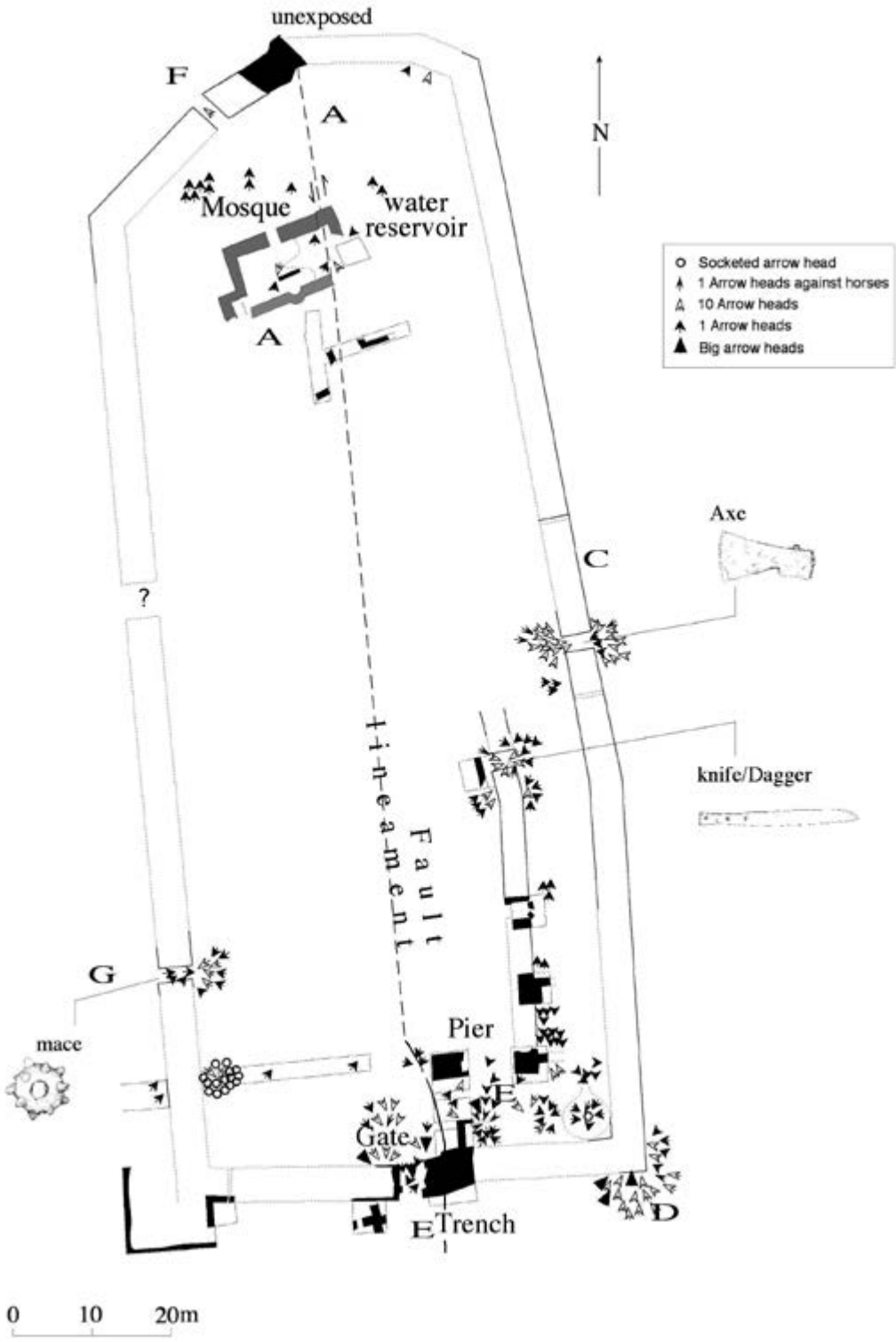



**Figure 5.15.** Distribution of arrowheads and weapons (map by the cartography unit at the Hebrew University of Jerusalem).


**Figure 5.16.** Aerial photograph of the fortress taken from the west. X = the likely location of a group of Muslim archers who fired at the eastern postern (C).

they caused among the Muslim force, and perhaps due to their identity, if they were Muslims in the service of the Templars.

Seeing that tanged arrowheads were used by both defenders and attackers and that they suited only composite bows, it appears that both the Frankish and the Muslim forces were using composite bows. There is, however, no historical reference to back up this conclusion, which is based only on the archaeological analysis of the arrowheads found at the site. The Crusaders, who were not originally familiar with the composite bow, learned how to use it during their two hundred years of rule in the Levant. The same conclusion was reached in an analysis of the finds from the Mamluk siege of Arsuf in 1265, where the arrowheads collected from the site were of the same type and yielded similar patterns of distribution.[59] The question of why the composite bow was never used later by archers employed in European armies is difficult to answer.

European merchants were forbidden to sell weapons to the Muslims or purchase weapons from them, and a strict ban was placed on the export of timber and iron from Europe to the East. But the profit to be made in the arms trade, and from the sale of raw materials for the arms industry, was too

59 Raphael and Tepper, Archaeological Evidence, 85–100.

great to pass up; thus, many European merchants ignored the ban.[60]

The arrow shafts were made from pine that was probably imported (Table 5.1).[61] While the iron used for the arrowheads may have come via a European merchant, the technology was developed over the centuries in the Middle East and in the central Asian steppe, where archers played a dominant role in both the infantry and the mounted forces.

**Table 5.1.** Analysis of wood samples from the arrowheads and the mace head.

| AREA | LOCUS | BASKET | TREE SPECIES | SOURCE OF WOOD SAMPLE |
|---|---|---|---|---|
| G — southwestern postern | 228 | 2266 | Conifer | Mace head socket (charred wood) |
| E — kitchen floor | 466 | 4533 | Conifer | Arrowhead tang (uncharred wood) |
| E — kitchen floor | 468 | 4536 | Conifer | Arrowhead tang (uncharred wood) |

## The Fortress' Defenders

The Templars' plan of defence and the sequence of the fighting during the siege is still an enigma. Both the archaeological finds and the historical sources are obscure. Bradbury and Marshall drew up a short list of defensive methods available to fortress garrisons: torching and destroying the surrounding area to deprive the enemy camp of food, water and grazing; attacking enemy stations; sapping the attackers' mines and torching the machines; bribing the besieging forces; and bombarding the enemy.[62] Fulton approached the subject in a different manner: "a truly active defence meant taking the fight to the besiegers and disrupting, delaying or defeating their attempts to gain entrance."[63] None of the above were carried out by the garrison at Jacob's Ford. It seems the Templars were not expecting Saladin to return and were ill-prepared when he arrived at their doorstep.

In general, there are very few descriptions of garrisons' actions during sieges. Most accounts are of the besieging camp, focusing on what happened outside the fortress. The descriptions we have of Bayt al-Aḥzān are no exception. The Muslim chroniclers do not record the Templars' fighting. The feeling one gets from reading the Arabic sources is that the Templar garrison was not as strong as the Muslims had first thought. Seizing the *bāshūra* with their infantry and testing the garrison's strength, rather than bombarding the site, proved successful.

60 Ashtor, E. The Crusader Kingdom and the Levant Trade. In B. Z. Kedar (ed.) *The Crusaders in Their Kingdom 1099–1291* (Jerusalem, 1988), 30–55.

61 See this volume, Chapter 15. The wood was analysed by Professor Nili Liphschitz, who headed the first archaeobotanical laboratory in Israel, at Tel Aviv University. Sadly, Professor Liphschitz passed away in 2019.

62 Marshall, *Warfare*, 224–225; Bradbury, *The Medieval Siege*, 79, 82, 84–85; Warner, P. *The Medieval Castle* (London, 2001), 53.

63 Fulton, *Siege Warfare*, 152.

The size of the force inside the fortress, workers and fighting men, amounted to 1500 and possibly more. The Templars were not short of manpower.[64] The relationship between the perimeter of the curtain wall (378 m), the quantity of arms stocked inside the fortress and the number of men, raises questions regarding the Templars' organization of the defences. Calculations made by Aris and Bachrach for a force of 100 archers, spaced at intervals of 1.26 m along a castle wall,[65] indicate that "A fully trained man was expected to loose a handful of up to five arrows in two and a half seconds."[66]

A volley of arrows, at a short distance, would hardly allow the enemy to reach the foot of the walls. There is no written evidence that the Muslim forces struggled, or undertook complex manoeuvres, to get to, or to work, below the walls (the "killing ground").[67] Perhaps the long straight walls without towers meant the archers found it difficult to protect the foot of the walls without exposing themselves to enemy fire.

We have no record of the eighty Templar knights engaging the enemy outside the fortress grounds. There was no attempt to attack the Muslim camp. The only fighting we are informed of is that against the force that captured the *bāshūra,* the torching of the gates to prevent the Muslims from entering the fortress grounds, and the dropping of inflammable vessels on the sappers working at the foot of the walls.

Although the besieging army always outnumbered the besieged garrison,[68] there are examples of Frankish garrisons who managed to hold their ground until reinforcements arrived.[69] While the Muslim sappers received praise for their achievements, their ability to correct their mistakes, and to overcome the difficulties posed by the width and strength of the curtain walls, it seems that part of their success was due to the poor organization of the garrison. According to Ellenblum, "the defenders were completely dependent upon forces coming to their rescue."[70]

The despair of the Templar garrison is perhaps best illustrated in the last scene that ʿImād al-Dīn describes: "I entered the fortress and witnessed the wonder and saw a knight on his horse who had jumped with his mount into the fire."

ودخلت اللحصن مشاهدت العجب ورات فارسا قد القى على النار حصانه وهو راكبه فانظر الى هذه الحمية والانفس الابية.[71]

It is important to bear in mind that the fortress was not completed; its gates were fully exposed and difficult to defend. Fighting galleries, wall walks,

64 Ellenblum, *Crusader Castles*, 273.

65 Bachrach B.S. and Aris, R. Military Technology and Garrison Organization: Some Observations on Anglo-Saxon Military Thinking in Light of the Burghal Hidage. *Technology and Culture* 31/1 (January 1990): 7–9. Their calculations are based on the Anglo-Saxon short bow, and on archers positioned along fortresses of a very different layout, and an enemy with abilities very different from the Ayyubids. Nevertheless, they give a good idea of the archers' strength and importance in times of siege.

66 Nicolle, D. *Saladin and the Saracens* (London, 1986), 9.

67 Bachrach and Aris, Military Technology, 5.

68 Bachrach, Medieval Siege, 132.

69 Fulton, *Siege Warfare*, 107–108. On the Frankish defence of Harim (1162), Banias (1157) and Crac des Chevaliers (year?), see Ellenblum, C*rusader Castles*, 227–229. Saladin besieged Beirut in 1182 and Odo, the town's bishop, organizes a vigorous defence, see Runciman, S. *A History of the Crusades* (London, 1994), vol.2: 352. During Saladin's siege of Karak in 1183 and 1184, the garrisons held out for several weeks, see Kennedy, *Crusader Castles*: 51–52. At Belvoir, Kennedy estimated the garrison numbered 500 men. The siege in 1188 lasted several months. Saladin eventually granted the garrison safe passage. Also see Benvenisti, *Holy Land*, 296–297.

70 Ellenblum, C*rusader Castles*, 229.

71 ʿImād al-Dīn, *Sana l-Barqu*, 170.

and towers did not exist. The garrison had a wide strong wall to protect them, but that was all they had. The location of the fortress, the lack of natural defences, its construction on a mound of soil, were considerable disadvantages.

The siege was over within five days. The Muslim force spent several more days destroying the fortress and collecting booty. Saladin spent a total of fourteen days at the site. The casualties on the Muslim side are not mentioned. Abū Shāma only writes that in the aftermath of the fighting, "a group of men fell ill from an epidemic [that broke out] because of the severe heat and the stench from the dead carcasses."

ومرض جماعة من ذلك الوباء لان الحركان شديدا وانتنت جيف القتلى[72]

The destruction of the fortress, and the filling of the water cistern with the dead bodies was not a symbolic act; it was an additional precaution to make sure the Franks would not return and rebuild the site. Before Saladin returned to Damascus, his forces raided Tiberias, Tyre, and Beirut.[73]

Saladin's victory has been described as a turning point in regional affairs. The Franks' failure was seen by some as the first signs of a change in the balance of power that began to tilt in favour of the Muslims. The destruction of the fortress and the loss of the garrison emphasized the weakness of the king's and the Templar's strategy, one that had been tried several decades earlier by a different king in similar circumstances.[74]

The period of raids that followed the destruction of the fortress at Jacob's Ford, was, in many respects, similar to that which existed throughout most of the twelfth century. The number of raids and their intensity increased for a short period due to the extreme drought that struck the region. Saladin's raids aimed first and foremost to relieve the food shortage in Damascus. Fields were harvested by raiding forces and grain was brought back to his capital. If one follows the events in the region up until the mid-1180s, there are very few changes in the conduct of both parties. In 1185 Saladin was still more than willing to sign a peace treaty with the Franks and supply them with wheat to relieve the Kingdom's approaching famine. The number of raids, full scale battles, and sieges did not grow in comparison to previous decades.

The destruction of Jacob's Ford led the Franks to abandon the idea of building fortresses directly on the frontier. Whether it was built as a base to protect the kingdom or as a base for setting out and raiding Damascus and its surroundings, Jacob's Ford was their final and last attempt at seizing one of the three strategic passages that guarded the roads between the Galilee and southern Syria. The Franks eventually realized the effort and cost were too great and their chances of success slim. The Templars would later invest on a grand and lavish scale and rebuild Safed, near the frontier, yet not on it. But that was in the future. Once the threat was removed, Saladin's dealings with the Franks were set aside, the sultan shifted his attention to Konya and its ruler Qilij Arslān, where more urgent matters awaited him.[75]

---

72 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:38.
73 Abū Shāma, *Kitāb al-rawḍatayn*, vol. 3:44.
74 See Chapter 3, regarding previous attempts to fortify the frontier and the construction of the fortress at Wadi El'al,
75 Ibn al-Athīr, *al-Kāmil* (Richards), 2: 271–272.

## Appendix 1

English translation of the Arabic text describing the conquest of the fortress from ʿImād al-Dīn al-Isfahānī, *Sana l-Barqu al-shami* (Riyadh, 1989)[76]

### Pages 158–159: Mention of the fortress of Bayt al-Aḥzān

Said (the author): The sultan went out to Baʿlabakk in an attempt to conquer it, and his stay there was prolonged. The Franks took advantage of his absence and acted arrogantly. The Templars among them (p. 159) began to build a fortress (*ḥiṣn*) on the ford of Bayt al-Aḥzān and built it well. The Sultan was told that when the fort was completed, the Islamic border region (*thaghr*) would be in danger and control would be lost, and there was a day's distance [by riding] between it and Damascus. The Sultan said: When they finish building it, we will go there, and we will raze it to the ground and turn it into ruins [literally: into traces of an abandoned encampment]. For now, we will leave them, until they finish all their business, and spend all their money on it [i.e., the fort] and exhaust their people, and when we come to them their hopes will be overturned and they will lose their money. We said [i.e., ʿImād al-Dīn and/or other advisers of Saladin): Preventing them [the construction of the fortress] in the first place is easier than defending afterwards.

[Said the Sultan?:] If the forerunner comes, he does not understand that he is now worthless, he must not give up and bear his suffering patiently through the power of his faith, placid in the light of the certainty of his faith, and indeed a year later, the blessed end came to pass as he said.

And when the matter of Baʿlabakk ended, the matter of the fortress remained the focus of his attention and he was determined to lay siege to it. [ʿImād al-Dīn now uses lyrical language to describe the following content:] There was a dry year in Syria, there was scarcity, poverty, trouble, and distress. The people suffered from a severe drought and hoped for the salvation of Allah. But the sultan's kindness came in place of the storm, as well as his great generosity, so we lived a life of welfare and abundance due to his kindness, and during his reign we drank from a protected spring.

### Pages 168–170: The encampment around the fortress of Bayt al-Aḥzān and short preparations for its conquest

As the infidels were weakened by the disasters that befell them from the Muslims, the sultan's determination to ascend the tower (*al-burj*) increased. He sent to the Turkmen and all over the country to gather the people and ordered the preparation of abundant flour and its distribution to the Turkmen. Then we went out as an army that darkened the mornings, that fortune favoured and whose danger was evident. The siege devices were carried, and the preparations were completed. We arrived at the ford of Bayt al-Aḥzān on Saturday. The fort was a building opposite (*dūna*)[77] the ford to the west. We made camp near it (of the transit camp) and pitched tents on the hills around it and cast forth "pigeons" and "turbans" until all within earshot were deafened.

We said: This is a solid fortress, and there is no alternative but to arrange covers (*sitār*) for the

76 Dr. Amir Mazor translated the text from Arabic to Hebrew. The text was translated from Hebrew to English and edited by Dr. Leigh Chipman. I would like to thank them both for their work and all their advice and help regarding the Arabic text and translation; it would have been extremely difficult to carry out this research without them.

77 The Arabic word can be translated "below, next to, beside, in front of."

place of the mangonels and collect the wooden tools (*al-akhshāb*) and the instruments (*al-ālāt*). On Sunday morning the sultan rode to the villages of Safed. The fortress of Safed was in those days in the hands of the Templars, the root of the trouble. The sultan ordered that his vineyards [probably referring to the lands of the villages of Safed] be cut down and that their vines and trees be carried away. Thus was all the equipment needed for mangonels completed. The sultan returned to the camp in the afternoon and went out again towards the evening. He gathered his emirs and consulted with them. ʿIzz al-Din Jāwulī al-Asadī said to him: Let us move forward [with the army] before placing the mangonels so that we can taste fighting with them and experience battle against them. Said [Saladin]: Do as you please [literally: ask Allah's counsel as you choose]. Indeed, [soldiers] were instructed throughout the area to advance and stand "in the place of revenge" (*maqām al-intiqām*). And they rose up in revenge, scattered throughout the area and approached the salient and attacked it, and gave the warriors who defended it the cup of death to drink[78] and reached it.

I knew someone from the masses of common people, brave as a lion, wearing a worn shirt, with a staff in his hand and leather armour. He breached the wall as he pushed, struggled, fought, and quarrelled, and his blows came one after the other and another [man] joined him and abandoned the group.

[The Crusaders] entered the fort and locked its gates and stood behind them on the upper crenelations (*sharāfāt*), and overlooked (or: were adjacent) to the arrow-slits of the fort. Our men overran the salient and filled it and everyone moved to it and defended it. They spent the whole night guarding it, with the Sultan sending them reinforcements and supplies and being careful not to open the gates. The people [the Crusaders] attacked them and we are told that they set fire behind every gate to protect themselves, but the Muslims did not attack. Then the defenders came to a decision and fervour returned to them. Then [the Sultan] gathered the emirs and the senior officers and divided the (attack on) the fortress among them. ʿIzz al-Din Farakhshāh took the southern wing and added to it the artisans (*ṣunnāʿ*) and the sappers (*naqqābīn*). The Sultan began digging on the northern side and Nāṣir al-Dīn Muḥammad b. Shīrkūh began digging near him. Taqī al-Dīn took a different part, and so each [senior] officer started [digging] on another side and did his job quickly. The Crusaders were above them on the walls behind the parapets (*satāʾir*), throwing vials (clay vessels with inflammable liquid). But the fortress was strongly built, and it was very difficult for the sappers to remove its stones.

The sultan finished digging the tunnel, which was filled with wood, on Monday night. He set [it] on fire thinking that this way [the fort] would collapse. The tunnel had a length of 30 cubits (*dhirāʿ*) and a width of 3 cubits. The width of the walls was 7 cubits, and they were not affected by the fire and its burning.

Monday morning came, all hearts were anxious, and what they thought would happen did not happen [literally: and expectations failed]. There was no choice but to deepen the tunnel for the burning fire within it. The sultan took out a bundle containing 300 Egyptian dinars and gave them to ʿIzz al-Dīn and ordered him to give one dinar to anyone who came with a waterskin.

(p. 170) And I saw the people carrying the waterskins and moving the water containers until they flooded the tunnel with water. The sappers

78 Read ساقوا instead of شاقوا in the text.

(*naqqābūn*) re-dug and deepened it, then checked it (*istaẓharū fīhi*) during Tuesday and Wednesday. Then they set it on fire. News came that the Franks had gathered in Tiberias and that they had filled the place[79] with their horses and their men, and the artisans (*al-ṣunnāʿ*) had barricaded themselves.

On Thursday the 24th of the month of Rabīʿ I, when the day dawned, the furnace got hot, the snake bit the lion, the earth trembled and trouble flared up [i.e., the situation worsened]. We looked at the walls and expectation lengthened, and the delay caused a bad feeling. And when the morning came and patience ran out and the decision fell, the wall was breached and the righteous were informed [of this], and the people hurried to the breach. The Franks gathered wood behind the wall [literally: behind what fell], and when the wall fell, winds came and blew the fire back on them. The fire burned the houses (*al-buyūt*) next to the wall on both sides, and [the Franks] took damage from every side. They gathered on the far side of the fire and were burned with the heat of the flames. They screamed for an *amān* (safe conduct) and demonstrated their surrender. The Sultan sat and thanked Allah. He interrogated the prisoners who were with him, and whoever had converted from Islam or was an archer (*rāmī*) was beheaded. [On the other hand] he freed from among the captives over a hundred Muslims who had been brought for construction and to cut the stones. Most of those imprisoned were killed by the victorious warriors and the mob that had gathered.

It was a pleasant victory, given as a gift, sublime. Due to the strength of its construction and its winding ways (*tawghīr subulihi*) [the Sultan] did not think that it could be conquered or imagine in his mind that it could be invaded. [The Sultan] had earlier offered 60,000 dinars under an agreement that would ensure that their people would not be harmed, but they refused. He even raised the amount to one hundred thousand, but they stood by their refusal.

He said: And I saw the Sultan happy, his face glowed with the light of joy. He had with him an emissary of al-Qūmiṣ who was pardoned, who witnessed the disaster that befell his people. The pain was heavy and unbearable, and the blood of the polytheists [i.e., Crusaders] flowed freely. The heat blazed, and the time had come for the burning of rage. [The Sultan] led the prisoners to Damascus. He stayed in the camp. The corpses of the dead dried up and the living were healed. Said [the Sultan]: I will not cease until I raze the place to the ground and restore hope for its demolition. We divided the fortress into cubits (*dhirāʿ*) and razed it to the ground. Jacob's tomb became a pilgrimage site again and I saw the joy of the visitors to it.

I entered the fort and witnessed a wonder: I saw a rider thrown with his horse into the fire as he rode on it. I looked at this zealotry and the proud souls. The Sultan remained in this hated structure until he finished the demolition work.

On Wednesday we left the place and when we arrived in Damascus we fell ill from the trouble of the plague and the stench of the air, so that more than ten emirs passed away to God's mercy. After suffering comes healing from Allah.

Said (the author): The poets congratulated the Sultan on the conquest of the fortress …

79 The text reads البرية "the desert"; this may be a mistake for القرية "the town."

## Appendix 2

English translation of the Arabic text describing the conquest of the fortress from Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmān b. Ismāʿīl, *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* vol. 3 (Beirut, 1997)[80]

**Pages 36–37: Regarding the Destruction of the Fortress of Bayt al-Aḥzān on Rabīʿ I.**

Al-ʿImād (ʿImād al-Dīn) said: The sultan left after he had gathered many of the cavalry and the infantry. He arrived at the Ford on Saturday the nineteenth. The fortress was built opposite the Ford on the west. He camped nearby it; the army filled the valley. The sultan had to erect covers (*satāʾir*) for the siege machines (*manjanīqāt*). Thus, the sultan rode on Sunday to the villages of Safed, which at the time belonged to the Templars, who are the root of our problems. He ordered to cut the orchards and bring the branches. He took what he needed and returned in the afternoon. They neared the fortress at dusk. Before the evening fell, they gained control of the *bāshūra*. The army moved to it, remained there all night and guarded, fearing the Franks would open the gates and attack them. Suddenly the Franks set fire behind each of the gates to protect themselves from the Muslims. The Muslims relaxed. They said: All we must do now is undermine the tower. The sultan distributed the work among his amirs. Farakhshāh took the southern side, the sultan took the northern side, Nāṣir al-Dīn Shīrkūh dug beside him and so did Taqī al-Dīn, all the high ranking amirs joined. The tower was extraordinarily well built, and it was difficult to dig under it. Nevertheless, before the first day ended the sultan had finished digging the tunnel [below the tower] and set fire to it. The tunnel was stacked with wood on the second day and torched. Its length was 30 cubits (*dhirāʿ*), its width 3 cubits.[81] The width of the curtain wall was 9 cubits. The Sultan was not alarmed. On the second day the sultan needed to extinguish the fire in order to complete the excavation [of the tunnel]. Whoever brought a water-skin [to extinguish the fire] would receive one dinar.

Al-ʿImād said: I saw men carrying water-skins and passing them until the tunnels were flooded and the fire extinguished. The sappers) *naqqābūn*) returned when the tunnel had cooled down. They drilled and made it deeper, they opened it, strengthened it, and split the rocks. Then they filled it with wood and set fire. And they managed to enter (*istaẓharū fīhi*) during the third and fourth day. They torched it and carefully guarded the site, as news arrived that the Franks were gathering in large numbers in Tiberias. On the fifth day, 24 Rabīʿ I, when the day began, the wall was breached and the righteous were announced.

The Franks had stacked wood behind the breached curtain wall and when the curtain wall fell the wind blew the flames towards them. The fire burnt their houses and a group of men. They gathered on the far side of the fire and asked for *amān* (guarantee of safety). When the flames died out the men (Muslims) entered, killed, captured, and pillaged one hundred thousand pieces of iron weapons of various types, many food products, and other different things. The captives were

80 Dr. Amir Mazor translated the text from Arabic to Hebrew. The text was translated from Hebrew to English by Kate Raphael and edited by Dr. Leigh Chipman. I would like to thank Dr. Amir Mazor for his work and all his advice regarding the Arabic text and translation, it would have been extremely difficult to carry out this research without his help.

81 *Dhirāʿ* (ذراع) in Syria = 0.68 m.; in Egypt = 0.58 m, according to Wehr, H. *Arabic-English Dictionary*. Cowan, J. M. (ed.) 4th edition (Wiesbaden, 1994), 356.

brought to the sultan, renegades (*murtadd*, Muslims who converted to Christianity(and archers were beheaded. Most of the captives were killed during the journey of the triumphant soldiers. The number of the captives was approximately seven hundred. More than one hundred Muslims were released from captivity; the rest were led to Damascus.

The sultan remained in the camp until the fortress was razed to its foundations. He filled the water cistern of the spring, in the centre (of the fortress), with earth and threw the bodies of the dead men in. The sultan received an emissary, al-Qumis, who was pardoned and was a witness to the disaster that was brought on his men.

Earlier, the sultan had offered sixty thousand dinars so that they (the Franks) would destroy the fortress, but they did not do so. He raised the sum to one hundred thousand dinars, and they still refused. All in all, they remained at the site for a total of fourteen days, this included its conquest and the days that followed.

**Pages 42–44:**

According to the letter sent by al-Qāḍī al-Fāḍil to Baghdad, a letter that describes the fortress: its curtain wall was over ten cubits wide, the largest of stones were cut and dressed for it, each stone was approximately seven cubits, the number of ashlars [along the curtain wall] was above twenty thousand. Not every stone was set in its place and the cost of each stone was four dinars and more. The gap between the two walls was filled with stones as hard as granite; the high mountain peaks are low compared to it. The ashlars were immersed in lime [mortar], if a stone from the fortress was coated with a handful of it, the lime would merge with the stone as if it was part of it, and it fused in the strongest and most solid way; it thus hinted to the enemy that it is iron that cannot be destroyed.

As for the description of the fire in the letter: the men spent the sixth night (until the morning) circling the fortress that was engulfed in fire. The tongues of fire descended on its crown and covered the back of the fortress. Allah snuffed the fire of the Franks with this blazing fire……The fire reached places it is difficult to imagine, places where even a needle could not be inserted…

The fire sent sparks and continued to burn all night, in the morning the servant extracted the stones from their very foundations, and he destroyed the fortress from edge to edge and after him came the army and its accompaniers…

And in a different dispatch: The fortress was built on a tel, and it had a water cistern. When the Muslims sacked the fortress, they threw in it approximately one thousand dead men and burnt animals and yet the courtyard and the cistern were still not filled. There were approximately one thousand suits of armour, the number of fighters was eighty with their servants. There were fifteen commanders, each commander commanded fifty soldiers, including various craftsmen: builders, architects, blacksmiths, carpenters, sword sharpeners, sword- and various weapon manufacturers. There were over one hundred Muslim captives in the fortress and the chains on their legs were removed to the legs of the Franks. The fortress was stocked with food for several years, good and abominable[82] types of meat and various goods that could keep for long periods of time.

And when the fighting started, on the first day they [the Muslims] attacked the yard [of the fortress], a group of soldiers was stationed in it. They were beheaded and their livestock was

82 Probably referring to pork.

taken. The tunnels were torched from five different directions, and they were filled with flames. The collapse of the curtain wall was delayed due to the substantial width of the construction. The fire never stopped burning, it was cleared and then lit and then died out until the tunnels were ready. They were stacked with wood and lit on the fifth day. And during the very same day the towers, that were already weakened cracked. The Muslims took over the fortress and everything and everyone in it. The fire raged on every side of the fortress. When the tyrant commander of the fortress saw the disaster, what befell his men and workers, he leapt into a tunnel of fire. He suffered the terrible heat and was transferred from one fire to another [to the fire of Hell]. Seven hundred Frankish captives were taken, after some were killed the number was still extraordinarily high.

The will to destroy the fortress grew, its existence and injury were to be wiped out, it was to be destroyed so that everyone could see. All this occurred as the Franks were gathering in Tiberias, aware of the situation. They saw the fortress engulfed in fire and smoke. A vicious attack was conducted by the [Muslim] army on the districts of Tyre, Sidon, and Beirut, they reached everywhere. The Franks could not rest in their own lands, castles and towns, fear struck the souls of those who remained…

According to another dispatch by al-Qāḍī al-Fāḍil, sent from the sultan to the caliph's vizier in Baghdad:

The treatment of vital needs, including diseases, troubles and many complaints was delayed. Most of them were related to the army soldiers who had returned from the attempt to capture the fortress. The servants of the supreme commander, his nephew Taqī al-Dīn and cousin Nāṣir al-Dīn, were weakened and exhausted, on the brink of despair, they were put to the test and almost failed.

But God showered healing grace and the good news of the conquest of the fortress. This knowledge was sublime, its virtues widespread everywhere…

CHAPTER 6

# THE MAMLUK HAMLET ABOVE THE RUINS OF THE FORTRESS

## The Golan (Al-Jawlān) in the Mamluk period

The territorial continuity from Egypt to Syria created by the Mamluks changed the role of the Golan. The sultanate's frontier had moved c. 700 km east, to the Euphrates. Thus, the Golan was no longer on the fringe of two rival political entities.[1]

A significant turning point in our understanding of its geopolitical importance was the correction of a long-standing error regarding the history of al-Subayba fortress (Qal'at Namrud), situated at the foot of Mt. Hermon. Ellenblum and Amitai's work showed the fortress was founded by the Ayyubids.[2] After it was besieged by the Mongols (1260), it was rebuilt by an exclusive owner (see below) on a grand scale. Hartal's excavations at the fortress and the discovery of the monumental inscriptions emphasized the impact of the political changes on settlement patterns, issues of security, and economic development.[3] In 1260, al-Subayba, Banias, and the region's villages were granted by Baybars (d. 1277) to the second most important figure in the sultanate: his viceroy Badr al-Dīn Bīlīk al-Khaznadār. The profits to be gained turned the Golan into a valuable asset and a most generous gift. The local population was the first to benefit from this enterprise.[4] People's lives, property, livestock, fields, and orchards were now secured against full-scale raids, theft, and wreckage. The turning of Safed into a centre of Mamluk administration, the reconstruction of the Templar fortress in the town immediately after Baybars sacked it (1266), and the building of a mosque and a market made it a prominent Mamluk urban centre. Although Safed is in

1 For a history of the early Mamluk sultanate, see Amitai-Preiss, R. *Mongols and Mamluks: The Mamluk-Ilkhanid War 1260–1281* (Cambridge, 1995) and Irwin, R. *The Middle East in the Middle Ages*: *The Early Mamluk Sultanate 1250–1382* (London, 1986). For a general introduction to the archaeology of the Mamluk Golan, see Hartal, M. and Dar, S. Mt. Ḥermon: 1985–1986. *Excavations and Surveys in Israel* 89:1–3; Hartal, M. *Northern Golan Heights*: *The Archaeological Survey as a Source of Regional History* (Israel Department of Antiquities and Museums/Ministry of Education and Culture, Qazrin, 1989), 135–136; Hartal, M. Archaeological Survey as a Source for the History of the Golan. *Qadmoniot* 148 (2014): 80–89.

2 Ellenblum, R. Who built Qal'at al-Subayba? *Dumbarton Oaks Papers* 43 (1989),103–112; Amitai, R. Notes on the Ayyubid Inscriptions at Al-Ṣubayba (Qalʿat Nimrod). *Dumbarton Oaks Papers* 43 (1989), 113–119.

3 Deschamps, P. Les Entrées des Chateâux des Croisés en Syrie et leurs defense. *Syria* 13 (1932), 369–387; Deschamps, P. *Les Chateâux des Croisés en Terre Sainte I. Le Crac des Chevaliers* (Paris, 1939), 2; Amitai, R. An Arabic Inscription at al-Ṣubayba (Qalʿat Namrud) from the Reign of Sultan Baybars. In M. Hartal *The Al-Ṣubayba (Nimrod) Fortress, Towers 11 and 9* (Jerusalem, 2001), 109–123.

4 Hartal, M. Introduction to the Archaeological Survey of the Golan http://survey.antiquities.org.il/#/Golan *see chapter 4.17*; Barbé, H. *Le château de Safed et son territoire a l'époque des Croisades*. Ph.D Dissertation, The Hebrew University of Jerusalem (2010), 84–85; Raphael, K. and Abbasi, M. The Spatial Distribution of Villages in the Galilee during the Mamluk and early Ottoman Periods (1260–1746): A Smooth Transition or a Full-Scale Crisis? *Cathedra* 179 (2020): 39–62. [Hebrew]

the Galilee, its proximity to the western slopes of the Golan contributed to the revival of the central road that crossed at Jacob's Ford and led to Damascus and therefore to the settlement of the region in the Mamluk period. This road that was used by the Mamluk pony express (postal service; *barīd*) became a major highway. Regional stability encouraged trade and communication; caravans to and from Damascus plied the Golan's main transport arteries. Safety and stability were guaranteed by the large garrisons at Safed and al-Subayba and by the Turkmen community that settled in the Golan in the twelfth century. The Turkmen tribes became an integral part of the Mamluk forces and received an *iqṭāʿ* in parts of the sultanate that required military reinforcement.[5]

As in the rest of the sultanate, four caravansaries were erected along the *barīd* route that crossed the Golan: Khan al- ʿAqaba in the southern Golan, Khan Jukhādir in the eastern central Golan, Qunayṭira in the northeast Golan and Khan Jisr Banāt Yaʿqūb at Jacob's Ford. Three bridges were constructed — Jisr Banāt Yaʿqūb, Umm al-Qanāṭir, and Jisr al-Muʿjamiyya — to make the journey safer and quicker (Fig. 6.1).[6] Mamluk investments were no doubt followed by a meticulous collection of taxes from both nomadic and sedentary communities. Current readings show the central regime did not invest in dams, mills, agricultural industries, markets, or village mosques.[7]

Regarding the nature of the region's villages, the picture is considerably more complex. The social and legal status of the *fallāḥīn* is still debated. Administrative documents show farmers were not the legal owners of the land, but could lawfully enjoy their harvest after paying the required taxes.[8] In contrast to the *fallāḥīn,* the livelihood of the *ʿurbān* (nomads) was based on private ownership of livestock and cooperative ownership of pasture. Most of the meat in the city markets came from animals raised by nomads. As long as the two populations depended on each other and were governed by an able ruler, the region could thrive.[9]

5 Amitai-Preiss, R., *Mongols and Mamluks*: *The Mamluk-Ilkhanid War, 1260–1291* (Cambridge, 2004), 65–66.

6 Cytryn-Silverman, K. *The Road Inns (khāns) in Bilād al-Shām* (Oxford, 2010), 7, 77, 121, 123; Petersen, A. Medieval Bridges of Palestine. In U. Vermeulen and K. D'hulster (eds.) *Egypt and Syria in the Fatimid, Ayyubid and Mamluk Eras* VI (Leuven, Paris and Walpole, 2010), 291–306; Petersen, A. *Gazetteer of Buildings in Muslim Palestine, Part* 1 (Oxford, 2001), 182–189; Tepper, Y. and Tepper, Y. The 'Horses' Barid' Dated to the Era of the Mamluk Sultan Baybars. In *Jerusalem and Eretz Israel* 1 (2003): 123–152 (Hebrew).

7 This picture may change as more research and excavations are conducted.

8 Frenkel, Y. Rural Society in Mamluk Palestine. *Cathedra* 77 (1995): 17–38; Frenkel, Y. Villages, the Religious Establishment and the Mamluk Military Aristocracy: Notes on the History of Migration and Land Tenure in Mamluk Bilad al-Sham. *Cathedra* 173 (2019): 37–58.

9 Khazanov, A. M. *Nomads and the Outside World*, 2nd ed. (Madison, Wisconsin, 1984); Leiser, G. The Endowment of the al-Zahiriyya in Damascus. *Journal of the Economic and Social History of the Orient* 27/1(1984): 33–55; Linder, R. P. *Nomads and Ottomans in Medieval Anatolia* (Bloomington, Indiana, 1983); Marx, E. Political Economy of Middle Eastern and North African Pastoral Nomads. In D. Chatty (ed.) *Nomadic Societies in the Middle East and North Africa Entering the 21st century* (Leiden and Boston, 2006), 78–97; Cervello, M. V. From the disappearance of 'tribe' to the reawakening of tribal feelings: Strategies of state among the formerly Bidan (Arabophone) of Mauritania. In D. Chatty (ed.) *Nomadic Societies in the Middle East and North Africa Entering the 21st century* (Leiden and Boston, 2006), 144–175.

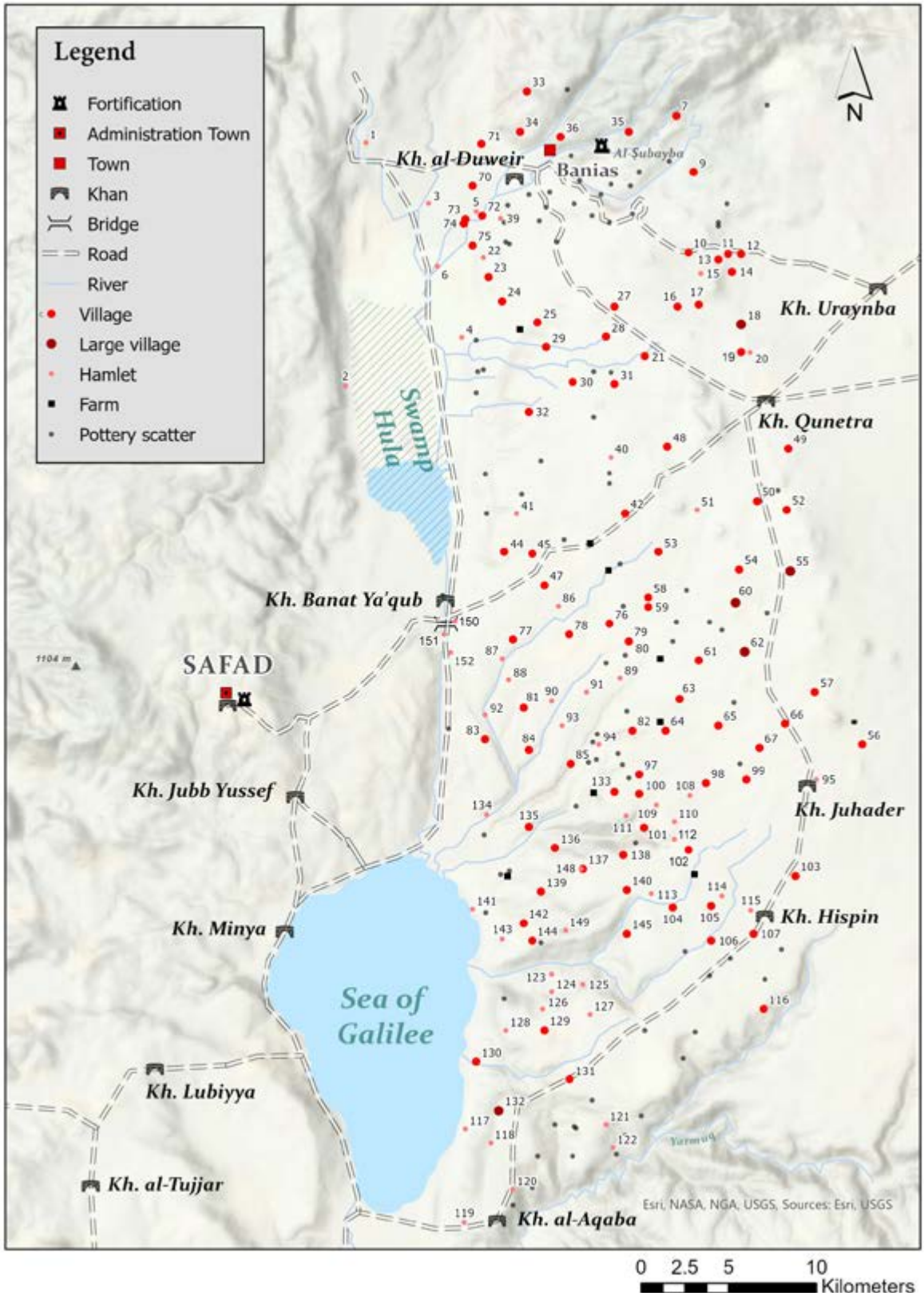



**Figure 6.1.** The Golan in the Mamluk period (by Yoav Yoskovich, based on the IAA archaeological survey).

## Crisis in the late Mamluk period

Historians of both the Mamluk and Ottoman periods propose that the Late Mamluk period saw an increase in Bedouin power. This led to an economic crisis in most branches of agriculture.[10] Low yields have been attributed to lack of irrigation and farming technology, government monopoly over certain produce, and a heavy tax burden.[11] The Mamluks' inability to adopt new agricultural production methods led, according to Ashtor, to certain degree of stagnation.[12] The implementation of the *iqṭāʿ* system is often thought to have constrained rural progress. Ben-Hurin found twenty village names in contemporary written sources;[13] Thus the map of the Mamluk Golan that relies only on historical sources shows a sparsely settled region.

In 1346 the Middle East was struck by the bubonic plague. The destruction it caused in Damascus in 1348 is documented in detail. The plague returned to Damascus and the Hauran several times (1362–1364, 1372–1373, 1375–1376, and 1411). The current estimates are that between a third to a half of the population in the Middle East perished.[14] All our knowledge about the plague derives from historical sources. At Banias, the Golan's administrative town, archaeologists documented a gradual decline in the fifteenth century, explained, at least in part, by the reoccurrence of the plague.[15] Without archaeological data from the rural hinterland of the Golan, however, it is impossible to determine the plague's impact, if it had an impact at all, and whether the number and limited size of the villages characterized the entire Mamluk period, or was the outcome of a crisis caused by the plague.

## Mamluk settlement in the Golan according to archaeological surveys

After four decades of surveys led by Moshe Hartal and Yigal Ben Ephraim, Hartal found 191 Mamluk sites and concluded that the Mamluk period was the third most populated period in the history of the Golan (Fig. 6.1), similar to that of the late Roman period: "The surveys showed that during this period there was unprecedented settlement flourishing throughout the Golan."[16] In addition, salvage excavations and three large-scale excavations (al-Subayba, Banias and Qasrin) further confirmed that the Mamluk presence throughout the Golan was significant. A similar picture can be seen in the Galilee.[17]

---

10 Amar, Z. *Foodstuffs and Industrial Products Grown in the Land of Israel during the Middle Ages* (Jerusalem, 1996), 12–14; Amar, Z. *Agricultural Production in the Land of Israel during the Middle Ages* (Jerusalem, 2000), 346–355.

11 Zevi, D. *The Ottoman Century: The District of Jerusalem* (Jerusalem, 1997), 55–57; Drori, Y. Eretz Israel in the Mamluk State (1260–1516). In A. Cohen *The History of Eretz Israel under the Mamluk and Ottoman Rule (1260–1804)* (Jerusalem, 1990), 24, 44.

12 Ashtor, E. *A Social and Economic History of the Near East in the Middle Ages* (London 1976), 331.

13 Ben-Hurin, A. The Mamluk and Ottoman period maps 13/IX. In *Atlas Israel.* Tel Aviv Survey Department (Tel Aviv, 1956).

14 Dols, M. W. *The Black Death in the Middle East* (Princeton, New Jersey, 1977); Dols, M. W. The Second Plague Pandemic and its Recurrences in the Middle East 1347–1894. *Journal of the Economic and Social History of the Orient* 222 (1979): 162–189; Borsch, S. J. *The Black Death in Egypt and England* (Austin, Texas, 2005).

15 Tsaferis, V. and Avner, R. Excavations at Banyas. *Qadmoniot* 23 (1990): 110–114; Tsaferis, V. Banyas. *Ariel* (1997), 122–123.

16 Hartal, Archaeological survey, 80–89.

17 Raphael and Abbasi, Spatial distribution of villages in the Galilee, 39–62.


**Figure 6.2.** Map showing the location of the Templar fortress at Jacob's Ford (Qasr Atara), the Mamluk bridge and the khan (by Tamar and Reuven Soffer)

## The Ayyubid and Mamluk hamlet at Bayt al-Aḥzān

The Ayyubid and later Mamluk hamlet that developed on the fortress ruins, the modest shrine at its northern edge, the Banāt Ya'qūb bridge constructed in the mid-thirteenth century (Fig. 6.2–6.3), and the khan that bears the same name, constructed in the mid-fifteenth century,[18] form a neat collection of buildings.

Evidence of the Mamluk hamlet could be seen across the excavation. Dwellings were constructed of basalt fieldstones and building blocks from the fortress, in the posterns, the main gate and along the eastern wall of the fortress (Fig. 6.4–6.5).

Twelve *tabuns* (common domestic mud ovens), were revealed above the collapsed levels of the fortress. The tabun distribution map gives a good picture of the extent of the Mamluk occupation (Fig. 6.6).

The largest and best preserved Mamluk dwelling was excavated along the eastern side of the fortress (Area B), between the curtain wall and the wall that supported the vault (W30). Fragments of basalt columns, floors made of basalt fieldstones, and stone basins were found in two rooms. The top of the Crusader wall was incorporated into the floor of the house (L372) (Figs. 6.7–6.8). The plan and layout of the Mamluk house is not entirely clear; the two rooms were either part of a larger living complex, or a small, very modest dwelling. The finds included horseshoes, a sickle and scissors. The pottery from the floor consisted of common domestic vessels that are well known from both rural and urban sites throughout the country in the late twelfth–fifteenth centuries.[19]

**Figure 6.3.** A view of Benat Yakub, looking northeast, showing the ancient bridge (Australian War Memorial B02197P, unknown photographer).

18 The bridge had already been built when Baybars besieged Safed in 1266. For a detailed discussion on its date and that of the khan, see Cytryn-Silverman, *The Road Inns*, page 106, footnote 403.

19 For the metal finds, see Chapter 13. For a detailed analysis of the Mamluk pottery see Chapter 14.

**Figure 6.4.** A Mamluk tabun (Area G, L202) inside the western fortress postern, looking east.

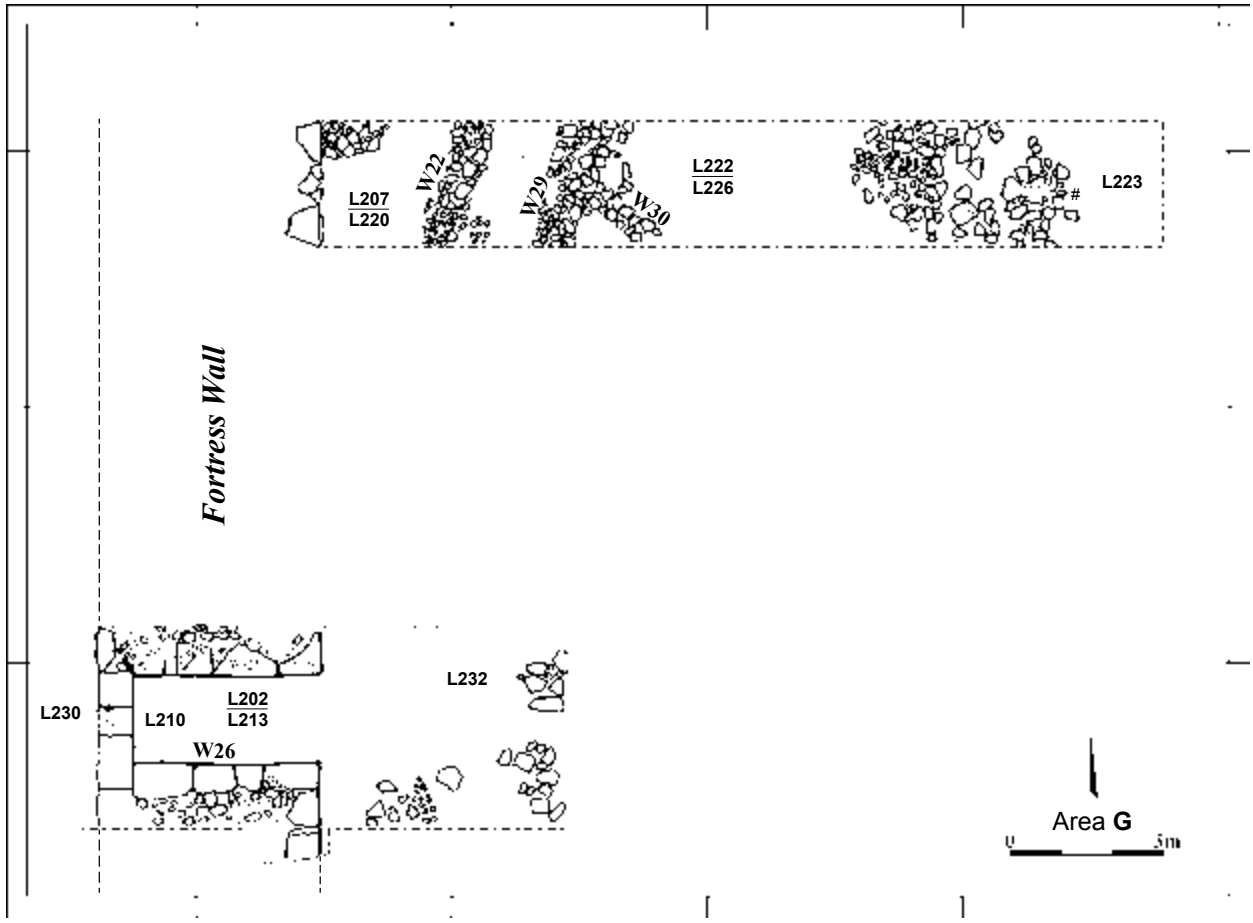



**Figure 6.5.** Plan of the western postern (Area G) and fragments of Mamluk walls in the sounding trench.

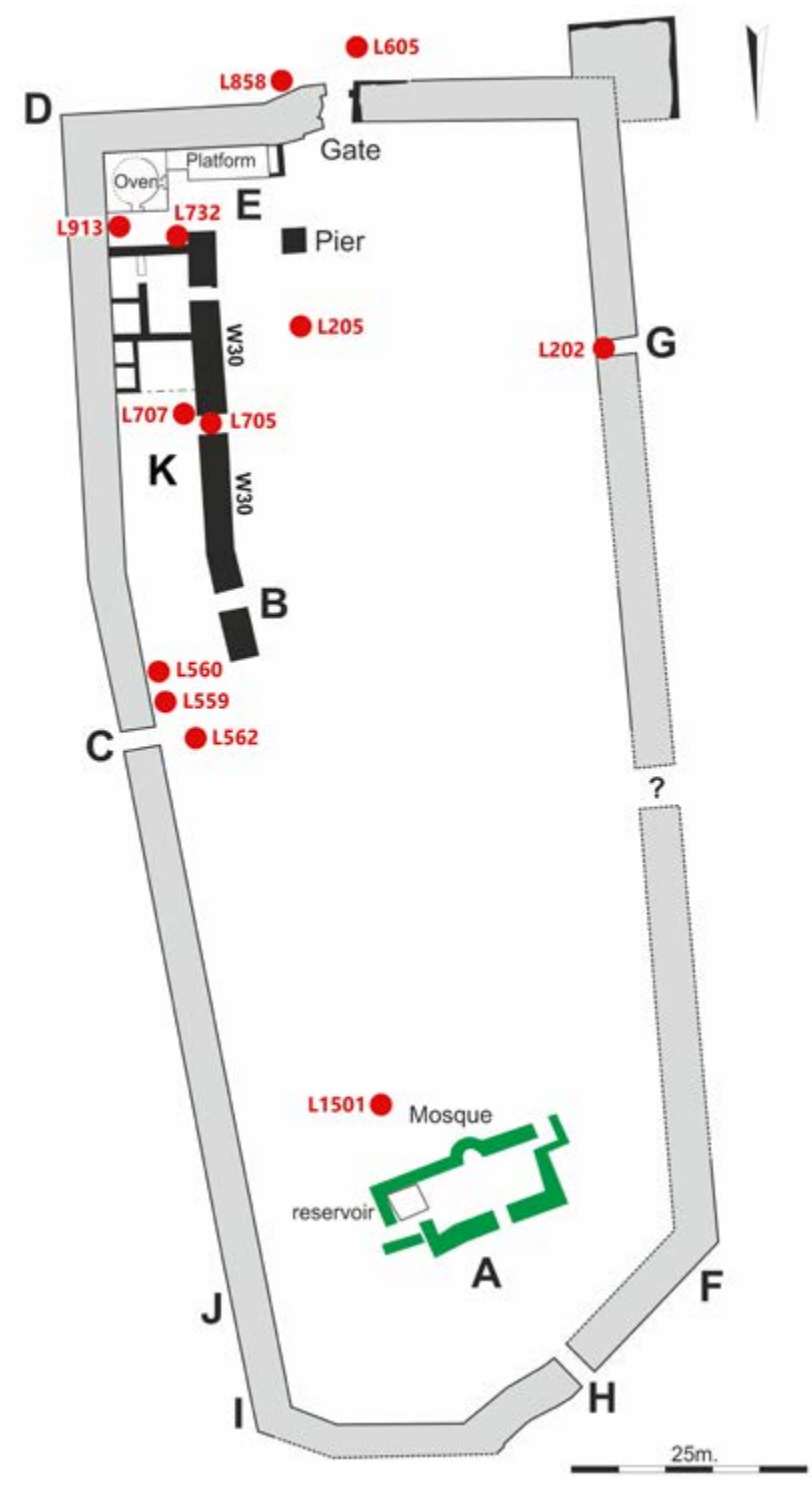



**Figure 6.6.** Distribution of Mamluk tabuns (red dots) above the fortress ruins (plan renewed by Jay Rosenberg, tabuns added by Shai Scharfberg).


**Figure 6.7.** The Mamluk dwelling in Area B, looking east.


**Figure 6.8.** The Mamluk floor with the large Crusader wall (W30) incorporated into it, looking south.

The 46 Ayyubid and Mamluk coins from the entire site give some idea of the date and length of its occupation.[20] The number of coins found at Jacob's Ford is considerably higher than most Mamluk and Ayyubid sites excavated in the Golan.[21] Based on the coins, the hamlet was first settled during the late 1180s-1218. The second group of coins dates to the Mamluk period: 1250–1348. The third period of occupation dates to 1389–1395.

**Table 6.1.** Coins from Area B.

| LOCUS | BASKET | MATERIAL | RULER/PERIOD | DATE | DENOMINATION | MINT |
|---|---|---|---|---|---|---|
| 353 | | Bronze | Ayyubid | 1171 | Fals | Damascus |
| 372 | 3576 | Bronze | Al-Malik al-ʿAzīz ʿImād al-Dīn ʿUthmān | 1195 | Fals | Damascus |
| 358 | 3549 | Bronze | Al-ʿĀdil Sayf al-Dīn Abū Bakr | 1199 | Fals | Damascus |
| 306 | 3013 | Bronze | Mamluk | 1300 | Fals | ? |
| 356 | 3547 | Bronze | Mamluk | 1300 | Fals | ? |
| 372 | 3576 | Bronze | Barqūq | 1390 | Fals | ? |

**Table 6.2.** Coins from Area E.

| LOCUS | BASKET | MATERIAL | RULER/PERIOD | DATE | DENOMINATION | MINT |
|---|---|---|---|---|---|---|
| | | Bronze | Al-Nāṣir Ṣāliḥ al-Dīn Yūsuf | 1189 | Fals | Damascus |
| 611 | 6067 | Silver | Al-ʿAzīz ʿUthmān | 1193 | Dirham | Damascus |
| 515 | 5095 | Bronze | Al-ʿĀdil Sayf al-Dīn Abū Bakr (Ayyubid) | 1195 | Fals | Ruha, al- |
| 867 | 8545 | Bronze | Al-ʿĀdil Sayf al-Dīn Abū Bakr (Ayyubid) | 1199 | Fals | Hama |
| 871 | 8559 | Bronze | Al-ʿĀdil Sayf al-Dīn Abū Bakr (Ayyubid) | 1199 | Fals | Damascus |
| 866 | | Bronze | Al-Ẓāhir Ghāzī | 1206 | Fals | Aleppo |
| 467 | 4534 | Bronze | Al-ʿĀdil Sayf al-Dīn Abū (Ayyubid) | 1211 | Fals | Damascus |
| 867 | 8545 | Bronze | Mamluk | 1250 | Fals | |
| 857 | 8517 | Bronze | Al-Nāṣir Ḥasan | 1348 | Fals | Damascus |
| 550 | 5102 | Bronze | Al-Ashraf Shaʿbān II | 1368 | Fals | Damascus |
| 80 | 8019 | Bronze | Al-Ṣāliḥ Ḥājjī II | 1389 | Fals | Damascus |
| W80 | 5125 | Bronze | Al-Zāhir Sayf al-Dīn Barqūq | 1390 | Fals | Alexandria |

20 For a detailed analysis of the Ayyubid and Mamluk coins, see Chapter 17. Tables 6.1-6.2 are based on the catalogue researched and prepared by Robert Kool.

21 A total of 104 coins from the Ayyubid and Mamluk periods was collected from 23 excavated sites on the Golan. Most were salvage excavations. I would like to thank Professor Haim Ben David and Dr. Michael Ozband, both from Kinneret College, for providing this information that they had gathered and researched.

## The mosque

The mosque, excavated at the northern edge of the fortress (16 x 10 m), was entered from a narrow door in the centre of its northern wall. It had two phases, the first being built by Saladin following his victory and the destruction of the Templar fortress. The pilgrimage site was thus re-established. A thirteenth century Ayyubid dirham was found on its floor (Area A, L252, B2521). The square reservoir in the southeast corner was filled; the mosque does not relate to it. It seems likely that the structure, built or renewed by Saladin, was damaged or destroyed by the 1202 earthquake.[22] The second phase, the mosque that can still be seen, was built in the Mamluk period using the Ayyubid floor and its foundation courses (Figs.6.9–6.12). It has thick walls (1.3–2.0 m) and, like its predecessor, was built from broken fortress ashlars and basalt field stones. A small room was constructed in the southwest corner. Pottery from its floor (L252) dates the structure to the Mamluk period. Its *miḥrāb* (the prayer niche facing south to Mecca) was built of bricks (Fig. 6.12). The mosque was probably used until the end of the Mamluk period, when the hamlet was abandoned. The fissure in its northern and eastern walls was caused by the eighteenth century earthquake.[23]

Few mosques of this size have been found in the Golan. The nearest rural Mamluk mosque was excavated in Qasrin (c. 7 km east of the fortress), built on the ruins of the sixth century CE synagogue.[24]

The Mamluk hamlet that developed on the fortress ruins may have served as the caretaker of the sacred site. The settlement was abandoned towards the end of the Mamluk period. There are no signs of destruction, no layers of ash or collapse, and no signs of violent conflict that drove the villagers away. The meagre collection of Ottoman pottery and four stray coins dating to the early eighteenth century and the first half of the nineteenth indicate that the site did not have a permanent sedentary community.[25] The site does not appear in the sixteenth century Ottoman tax registers.

The archaeological evidence for the lack of settlement in the Ottoman period is further supported by the descriptions left by the first European travellers: the Franciscan clergyman Franciscus Quaresmius, who visited the site in the first half of the seventeenth century, and Richard Pococke, who visited the site in the first half of the eighteenth century. Neither mention an inhabited village on the fortress ruins. Pococke refers to the site as Kaifar (village/hamlet)-aterah, a name that was perhaps preserved from the Mamluk period. Pococke does not mention the mosque, 'At the north end [of the fortress] there is a great heap of ruins',[26] perhaps refers to the ruins of the mosque. The site had stopped being a place of pilgrimage long before his visit.

---

22 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–97.

23 See Chapter 8.

24 Ma'oz, Z.U. and Killebrew, A. E. Ancient Qasrin: Synagogue and Village. *Biblical Archaeologist* 51 (1988): 5–19.

25 For the Ottoman coins, see the coin catalogue in Chapter 17.

26 Pococke, R. *A Description of the East, and Some Other Countries* (London, 1843), vol. II, 73.

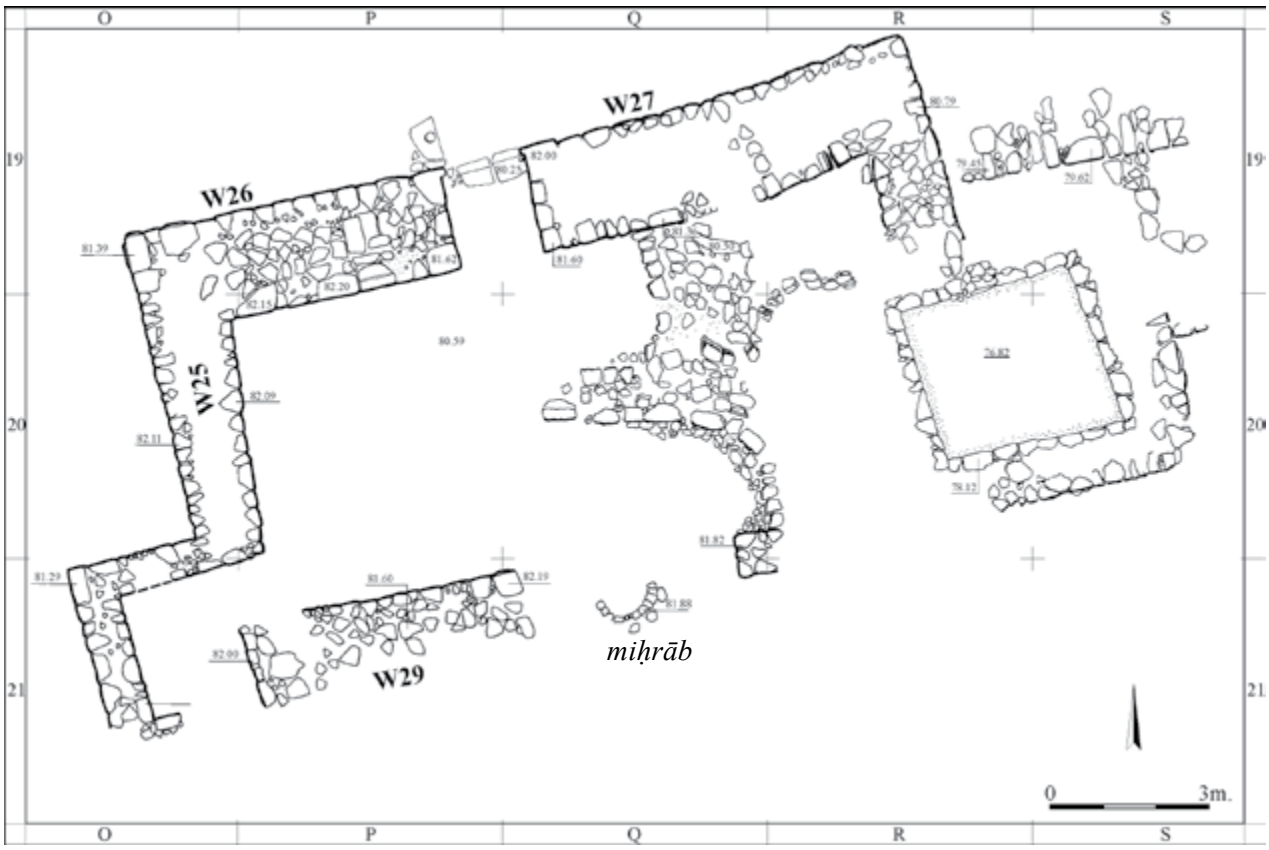



**Figure 6.9.** Plan of the mosque, Area A (renewed by Jay Rosenberg).


**Figure 6.10.** The mosque, looking south (Area A).


**Figure 6.11.**The stone foundation of the mosque's floor and the side entrance into the southwest chamber, looking east.

**Figure 6.12.** The brick *miḥrāb* (Area A, L151).

## The Mamluk graveyard

A small cemetery developed around the mosque.[27] Twenty cist graves belonging to children, men and women were excavated east and south of the mosque (Fig. 6.13).[28] The variety of age groups suggests the graveyard served the small community of families. Some graves were clearly oriented along an east-west axis. Most were only partially preserved, the skeletons rarely complete. Mamluk skeletons were also found scattered outside the 'official' cemetery. Four, possibly five, skeletons were uncovered in Area B (Season 1994, L361), in simple pit burials, below a level of small field stones.

**Figure 6.13.** A Mamluk cist grave (Area A, L158).

27 Ellenblum, R. Frontier Activities, 84

28 Similar graves were excavated by Gorzalczany, A. A Mamluk-Period Settlement and Cemetery at Ge'alya, near Yavne. *'Atiqot* 86 (2016), 69–110.

CHAPTER 7

# EQUID SKELETONS FROM THE FRANKISH CASTLE OF VADUM IACOB: ARCHAEOZOOLOGICAL EVIDENCE OF A MASSACRE

*Hadas Motro, Rivka Rabinovich and Ronnie Ellenblum*

The contemporary Muslim account of the siege and destruction of Vadum Iacob describe the weapons and equipment of the 1,500 Frankish men (warriors and labourers) that were captured, together with the livestock and horses' gear.[1] Thus, the discovery of nine articulated equids and five articulated human skeletons during excavations at the site came as no surprise. The cistern in which the majority were supposedly dumped has so far not been located.

## The skeletal finds

The animal remains, found under the vault,[2] may be divided into two groups: Group 1 includes articulated equids (AT1–AT10), a piglet, and skeletons of humans killed during the battle. Group 2 includes animal remains found under the articulated equids, on the oven floor, outside the oven and next to its opening.[3] Most are burnt bones of sheep, goats, pigs, and chicken — animals probably consumed during the construction of the castle. These bone concentrations probably derived from oven cleaning; the bones may have been intended for later use as fuel.

All the equid skeletal remains described here were found under the debris in the southern edge of the long barrel vault, destroyed by the Muslims after the battle. This vault was the only complete building in the fortress. It was not disturbed by later human activity or scavengers (Figs. 7.1–7.2). The skeletons found below the debris were dated by

1 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl. *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3:43; Ibn al-Athir, *Extrait de la chronique intitulée Kamel-altevarykh, par Ibn-Alatyr.* In Recueil des Historiens des Croisades. Académie des Inscriptions et Belles-Lettres, Historiens orientaux (Paris 1872–1906), vol. 4: 636; ʿImād al-Dīn al-Isfahānī, *Sana l-Barqu al-shami* (Riyadh, 1989), 168–171; William-of-Tyre, Willelmi Tyrensis Archiepiscopi Chronicon. *ed. R.B.C. Huygens, Corpus Christianorum Continuatio Mediaevalis* (Turnhout 1986), 21 (29), 1003; Barber, M. Frontier Warfare in the Latin Kingdom of Jerusalem: The Campaign of Jacob's Ford, 1178–1179. In J. France and W. G. Zajac (eds.) *The Crusades and their Sources*: *Essays Presented to Bernard Hamilton* (Aldershot, Hampshire, U.K., 1989), 9–22; Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–98; Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007), 258–274.

2 For the archaeological contexts see Chapters 4 and 5.

3 For detailed analyses of the animal bones, see Chapters 10 and 11.

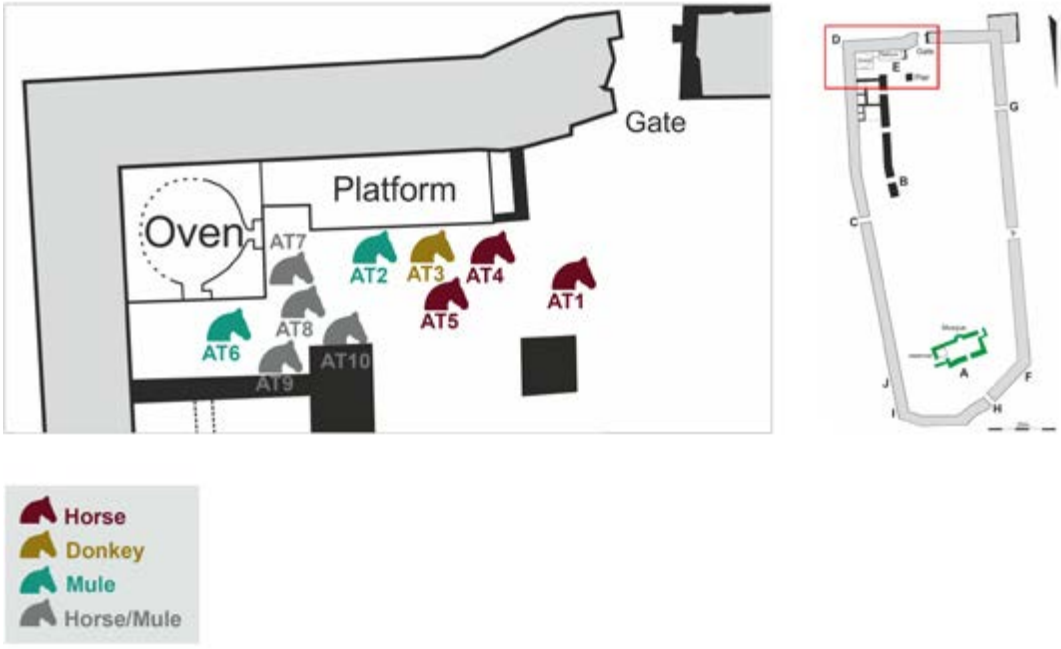



**Figure 7.1.** The large, vaulted building (Area E), and the location of the equid skeletons (by Hadas Motro).

coins and diagnostic pottery.[4] Evidence of warfare (ash, burnt wood and cereals, the building debris, one hundred arrowheads and human skeletons) reflects the events of the last days of August 1179.

The fine preservation and anatomical articulation of the equid skeletons (AT1–AT10) shows that they were still covered with flesh when the vault collapsed. All the equid skeletons were articulated but not complete. Specimens AT1–2, 5–6 and 9 were represented by both cranial and postcranial bones, while AT3–4, 7–8 and 10 were only represented by postcranial elements (Fig. 7.3). The minimum number of individuals (MNI) was considered to be nine equids, since AT9 may be the fore part of AT10. This study will therefore focus only on equids AT1–AT9.

The combination of carcass interment under the vault debris and moist soil caused the bones to break and crack. The bones were fragile and their outer surfaces suffered from severe exfoliation. Some of the more delicate elements, such as skulls and pelvis parts, were badly damaged, limiting the number of measurable pieces and making the task of the field conservator much more difficult.[5]

4 See Chapters 14 and 17.

5 The field conservator, Ms. Gali Beiner, was included in the team when it became clear that the number of equids was quite substantial. The equids AT6–AT9 and the piglet were excavated using a 1 x 1 m grid. Dry sieving (in a 5 mm sifter) and wet sieving (in a 1 mm sifter of 10% of the floor's excavated volume) were applied to the material of the last two seasons.


**Figure 7.2.** Reconstruction showing three horses (AT6–AT8) on the floor of the large vaulted building (drawing by Suzan MacMinn).

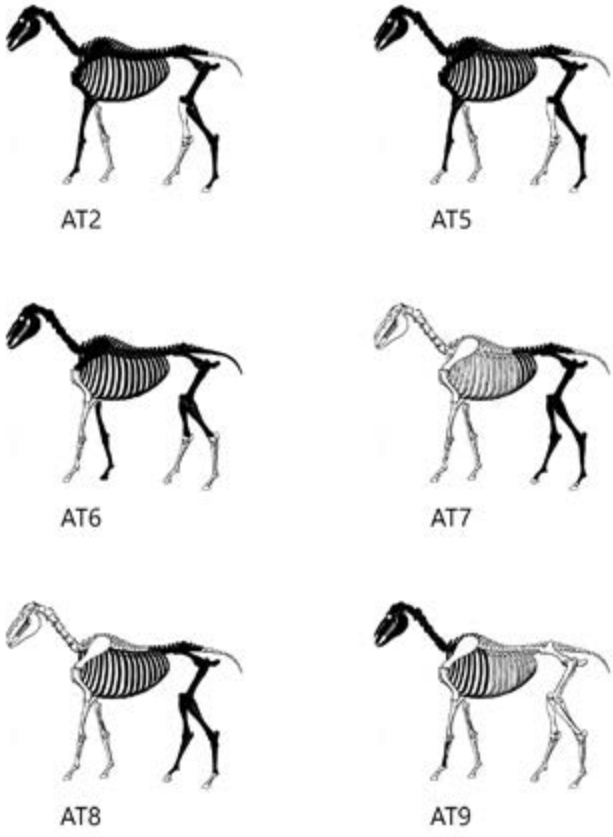



**Figure 7.3.** Six equids, showing the anatomical elements uncovered at Vadum Iacob (by Hadas Motro).

# Methods

## Identification

Equid species were identified based on dental morphology and biometry data of cheek teeth (premolars and molars) and the third metacarpal, which are considered to be the most indicative skeletal elements.[6] Standard cranial and postcranial measurements were taken according to Eisenmann.[7] Analysis of the enamel patterns of the occlusal cheek teeth included measurements and indices. Several commonly used indices were applied: (1) the protocone indices[8] for the upper cheek teeth; (2) the pre- and postflexid and double knot (the lingual fold) indices for the lower cheek teeth;[9] and (3) the ratio between width and length of the occlusal surface of both upper and lower cheek teeth.[10]

In addition, descriptive morphological characteristics of the occlusal surface of all teeth were recorded, particularly the shape of the protocone in the upper cheek teeth, the presence or absence of a caballine fold in the upper cheek teeth, the shape of the lingual fold in the lower cheek teeth and the degree to which the extoflexid penetrates between the pre- and postflexid in the lower molars (see Appendix 7.1).[11] Damage to the teeth made it difficult to measure or calculate their maximal height.

Although the metacarpals (MC III) tend to provide better information than the metatarsals (MT III) for differentiation between equid species, both metapodials were analysed. In both cases, the slenderness index[12] was calculated.[13]

Identifications and measurements were compared with modern equids housed in the comparative mammalian collections of the National Natural History Collection of The Hebrew University of Jerusalem (NNHC HUJI) and with measurements of modern equids (see Appendix 7.1).

## Age and sex

Two methods were employed to define age group: long bone epiphyseal fusion and dental

---

6 Bökönyi, S. Appendix A. Once More on the Osteological Differences of the Horse, the Half-ass and the Ass. In L. Firouz (ed.) *The Caspian Miniature Horse in Iran*. Miami: Field Research Projects 64 (1972), 12–23; Davis, S. J. Late Pleistocene and Holocene equid remains from Israel. *Zoological Journal of the Linnean Society* 70 (1980): 289–312; Ashbee, P. Hook, Warsash, Hampshire Excavations, 1954. *Hampshire Field Club and Archaeological Society* 43 (1987): 21–62; Eisenmann, V. Les chevaux (*Equus sensu lato*) fossils et actuels: cranes et dents jugales supérieures. *Editions du Centre National de la Recherche Scientifique* (Paris, 1980); Eisenmann, V. Comparative Osteology of Modern and Fossil Horses, Half-asses, and Asses. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden, 1986), 67–116; Eisenmann, V. and Beckouche, S. Identification and Discrimination of Metapodials from Pleistocene and Modern *Equus*, Wild and Domestic. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden,1986), 117–163; Johnstone, C. Those Elusive Mules: Investigating Osteometric Methods for Their Identification. In M. Mashkour (ed.) *Equids in Time and Space: Proceedings of the 9th Conference of the International Council of Zooarchaeology* (Oxford, 2005), 183–191.

7 Eisenmann, V., Alberdi, M.T., De Giuli, C. and Staesche, U. Methodology. In M. Woodburne and P. Sondaar (eds.) *Studying Fossil Horses* (Leiden, 1988), vol. 1, 1–71.

8 Protocone indices (PI)=occlusal length of the protocone x 100/occlusal length of the tooth. See Eisenmann et al., Methodology.

9 Calculated in the same manner as the protocone indices. See Eisenmann et al., Methodology.

10 Also calculated in the same manner as the protocone indices.

11 Bökönyi, Appendix A; Eisenmann, Les chevaux; Davis, Late Pleistocene; Zeder, M. A. The Equid Remains from Tel-e Malyan, Southern Iran. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden, 1986), 366–412; Ashbee, Warsash, Hampshire excavations; Eisenmann et al., Methodology.

12 Slenderness index (SI) = breadth in the middle/length x 100.

13 Bökönyi, Appendix A; Eisenmann and Beckouche, Identification and discrimination.

development and attrition rates.[14] Differentiation between males and females was based on the presence of full sized canines in stallions and their absence or rudimentary state in mares. Morphological characteristics of the pelvis shape were inapplicable because of the condition of the bones.

**Size**

Withers height was calculated from the lengths of the long bones, using Kiesewalter's research as summarized by von den Driesch and Boessneck.[15]

**Statistical methods**

When analysing archaeological material, the problem of missing measurements is repeatedly encountered due to fragmentation of the bones and teeth. To counter this, when running the cluster analysis, in some cases data was substituted using multiple regressions that predict the value of the missing measurement using its magnitude relative to other measurements of the same individual. The value is calculated by comparing the measurements of the missing bone in other individuals, to other bones in those same individuals. Since every bone has its range and variance, measurements were initially standardized by dividing them by their standard deviation. Standardized Euclidean distance was then calculated between measurements. When data was missing in many individuals, it was not incorporated in the analysis.

Cluster analysis was done on indices for bone ratios as well as for linear measures (in the case of teeth, metapodials and withers heights) to provide a comprehensive view of all characters of a specific skeleton and for species attribution. Cluster analyses of the teeth included both measurements and indices of the upper and lower third and fourth premolars, and the first and second molars of the following equids: AT1, AT2, AT5, AT6 and AT9. Cluster analyses of the metapodials included the metacarpals of equids AT2, AT3 and AT9 and the metatarsals of equids AT6, AT7 and AT8.

Clustering was performed using Ward's method: distances between individuals are squared Euclidean, with minimum variance clustering. The cluster analysis was run using Multi-Variate Statistical Package (MVSP) software.[16]

Identification of horse and donkey using third metacarpals and metatarsals was also undertaken by comparing them to best-fit linear regression lines of modern horses, mules, and donkeys, with a 95% confidence level.

14 Silver, I. A. The Ageing of Domestic Animals. In D. R. Brothwell and E. S. Higgs (eds.) *Science in Archaeology* 2nd ed. (London, 1969), 283–302; Levine, M. A. The use of crown height measurements and eruption-wear sequences to age horse teeth. In B. Wilson, C. Grigson and S. Payne (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*. BAR British Series 109 (Oxford, 1982), 223–250.

15 Driesch, A., von den and Boessneck, J. Kritische Anmerkungen zur Widerristhöhenberechnung aus Lāngenmassen vor-und frühgeschichtlicher Tierknochen. *Säugetierkundliche Mitteilungen* 22 (1974): 325–348.

16 Kovach computing services. (2001). Multivariate Statistical Package, version 3.12h.

# Results

## Identification

Measurements taken on the nine equid skeletons from Vadum Iacob are presented in Appendices 7.2 and 7.3. Morphological characteristics of premolars and molars are presented in Appendix 7.4. The illustrations in Appendix 7.1. give the cheek teeth terminology used.

All the upper cheek teeth of equids AT1, AT4, AT5 and AT9 have well-developed caballine folds and relatively asymmetrical and long protocones, elongated and tapering gradually in the posterior direction, as in the horse.[17] The protocone index (Table 7.1) in equids AT1, AT4, AT5 and AT9 increases from P4 to M1, also characteristic of horses.[18]

**Table 7.1.** Protocone indices of upper teeth of Vadum Iacob equids.

| | UP2 | UP3 | UP4 | UM1 | UM2 | UM3 |
|---|---|---|---|---|---|---|
| AT1 | - | - | 43.16 | 49.06 | 50.77 | 51.41 |
| AT2 | 27.54 | 46.15 | 53.10 | 51.79 | 52.84 | - |
| AT6 | 29.52 | 33.21 | 35.24 | 40.28 | 43.35 | 47.32 |
| AT9 | 22.14 | 34.46 | 36.90 | 45.59 | 48.90 | 44.88 |

The lower premolars and molars of equids AT1, AT4, AT5 and AT9 (Fig. 7.4) have U-shaped lingual folds, typical of horses.[19] The external fold (the ectoflexid) of the lower molars shows partial penetration between the pre- and postflexid, a characteristic of the horse.[20] In addition, the lingual fold attached the 'boundaries' of the occlusal surface.[21]

The lower premolars of these equids have (mostly P3–4) lingual folds with an open V-shape (in P2 U-shaped) and the molars tend to be open V-shaped (in M1–2) and V-shaped in M3 (Fig. 7.4 and Appendix 7.4). Equid AT6 resembles mules in that their lingual folds are often quite open and yet on average more sharply V-shaped than in the horse.[22] The external fold of the lower molars is between the pre- and postflexid, as in horses and mules.[23]

The upper cheek teeth of equid AT2 (Fig. 7.4 and Appendix 7.4) exhibit caballine folds but in P4-M2 the folds are weakly expressed and in M3 the fold is absent. The non-uniformity of this fold characterizes mules (see above). In addition, in the

17 Bökönyi, Appendix A; Davis, Late Pleistocene; Eisenmann and Beckouche, Identification and Discrimination; Zeder, Equid Remains; Ashbee, Warsash, Hampshire excavations; Eisenmann et al., Methodology.

18 Eisenmann, V. Les chevaux.

19 Bökönyi, Appendix A; Davis Late Pleistocene; Eisenmann and Beckouche, Identification and discrimination; Zeder, The Equid Remains; Ashbee, Warsash, Hampshire excavations; Eisenmann et al., Methodology.

20 Bökönyi, Appendix A; Zeder, Equid Remains.

21 Bökönyi, Appendix A; Eisenmann, V. Comparative Osteology.

22 Zeder, The Equid Remains; Cupere, B. D. Animals at Ancient Sagalassos: Evidence of the Faunal Remains. In M. Waelkens (ed.) *Studies in Eastern Mediterranean Archaeology* IV (Turnhout, 2001), 66–91; Driesch and Boessneck, Kritische Anmerkungen; Driesch, A., von den and Peters, J. Frühe pferde- und maultierskelette aus Auaris (Tell El-Dabca), östliches Nildelta. Ä*gypten und Levante* XI (2001): 301–311.

23 Zeder, The Equid Remains; Cupere, B. D. Animals at Ancient Sagalassos.

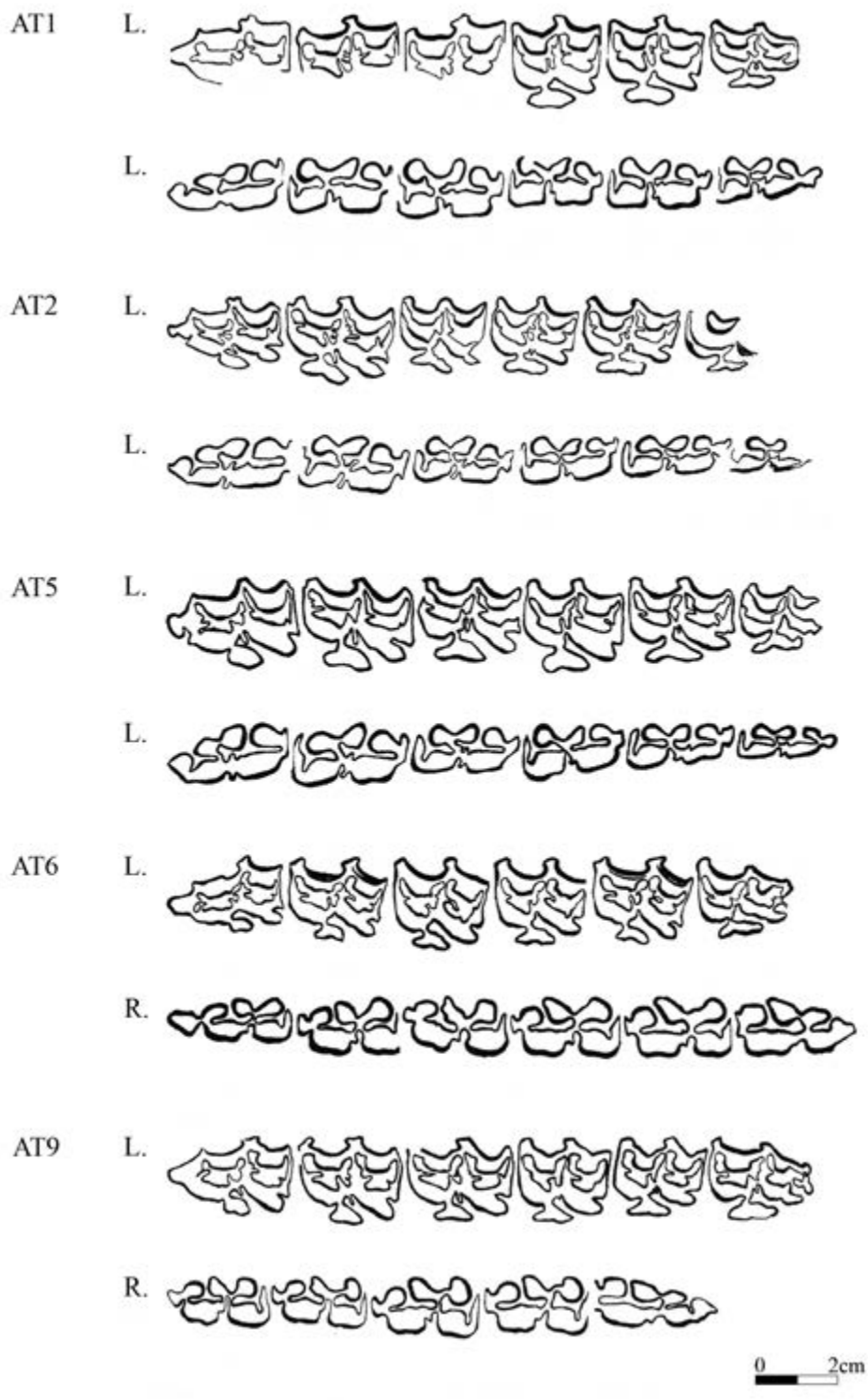



**Figure 7.4.** Occlusal view of upper and lower cheek teeth of equids from Vadum Iacob (by Hadas Motro)

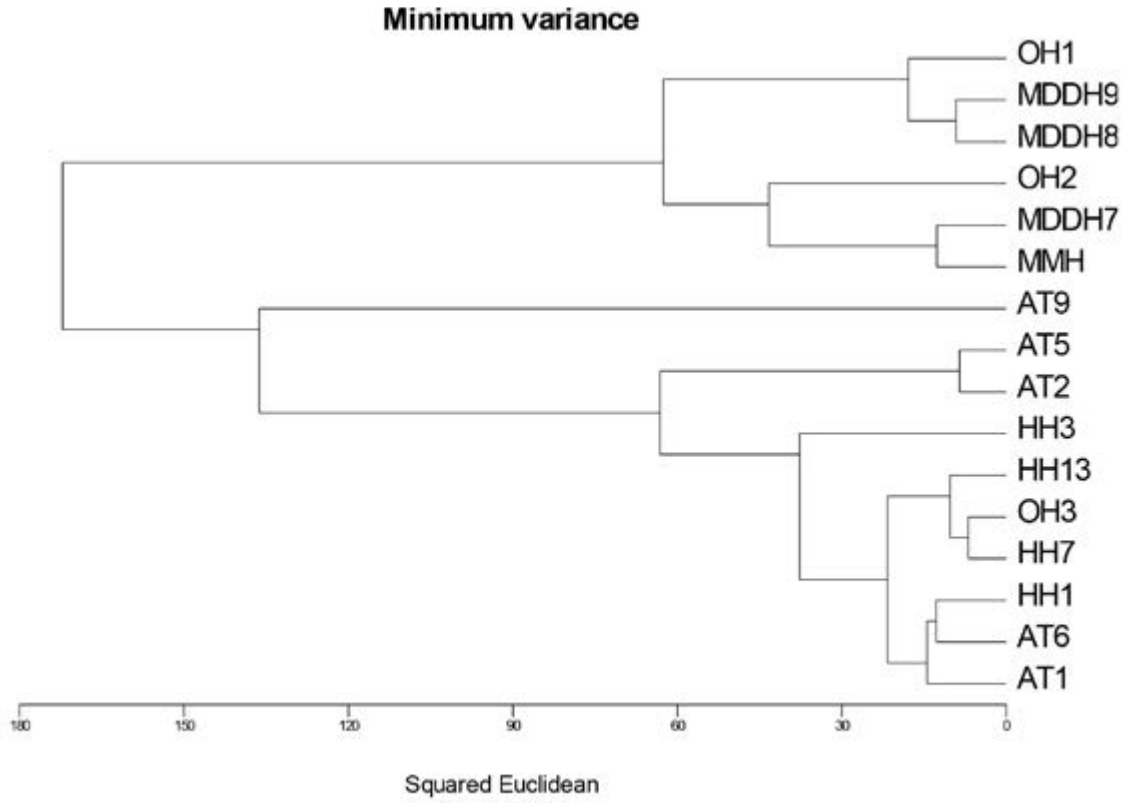



**Figure 7.5.** Cluster analysis of the upper and lower cheek teeth (P3–4 and M1–2) of the Vadum Iacob equids compared to modern equids from the mammalian comparative collections of the Hebrew University of Jerusalem (HUJI). HH = Modern horse from HUJI; MDDH = Modern domestic donkey from HUJI; MMH = Modern mule from HUJI.

upper cheek teeth of this individual the protocones are relatively long (as in the horse). Its protocone indices (Table 7.1) decrease from P4 to M1, as in the donkey. The lower premolars of these equids (Fig. 7.4 and Appendix 7.4) have V-shaped lingual folds in P3 and P4, and U-shaped in P2. The molars tend to be open V-shaped, as found in mules. The external fold of the lower molars is external to (but very near) the pre- and postflexid, as in the donkey and the mule (in this specimen it more closely resembles the mule).

Following the morphological characteristics of the occlusal surface (Appendix 4), equids AT1, AT4, AT5 and AT9 were identified as horse (*Equus caballus*). Equids AT2 and AT6 fall somewhere between horse and donkey and resemble their hybrid — the mule (♀*E. caballus* X ♂*E. asinus*). Cluster analyses was used for examining the Vadum Iacob equids. The results for the teeth show two obvious branches, with all the Vadum Iacob equids falling on the horse branch. In this branch AT9 is separate from the others. AT2 and AT5 are close to each other, in a separate branch. AT6 fits

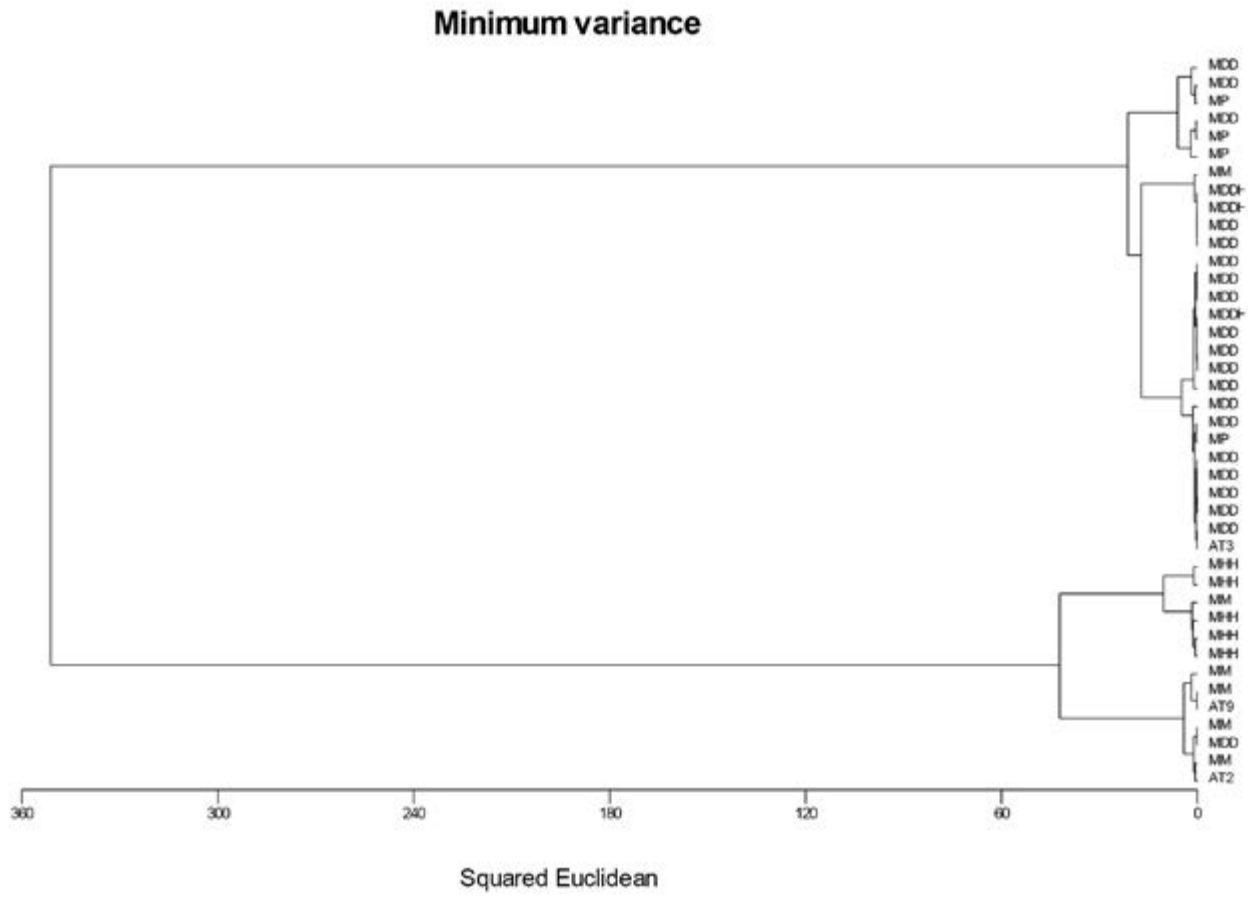



**Figure 7.6.** Cluster analysis of the metacarpal of the Vadum Iacob equids compared to modern equids from the mammalian comparative collections of the Hebrew University of Jerusalem (HUJI) and to data from Eisenmann and Beckouche (1986). HUJI: HH = Modern horse from HUJI; MDDH = Modern domestic donkey from HUJI; MMH = Modern mule from HUJI. Eisenmann and Beckouche (1986): MP = Modern pony; MHH = Modern heavy horse; MDD = Modern domestic donkey; MM = Modern mule.

with the horse HH1, and AT1 is very near to the HH1 branch (Fig. 7.5). The lack of more modern mule measurements and the uncertain identification of the modern mule included in this cluster, lead to the differentiating of only two distinct branches — donkeys and horses, and the linkage of the Vadum Iacob equids to the horse branch.

Cluster analyses of metacarpals of the Vadum Iacob equids and modern equids shows that AT3 definitely fits the branch dominated by donkeys. AT2 and AT9 fit the other branch, that includes the horses and the mules. These two equids fall in two different but close branches that split from the main horse/mule branch (Fig. 6).

Cluster analyses of the metatarsal of the Vadum Iacob equids and modern equids shows that AT6, AT7, and AT8 fall within the branch of horses and mules. AT6 belongs to a separate small branch of mules, and AT7 and AT8 who are very similar belong to a different branch of mules (Fig. 7.7).

It was difficult to identify the equids from Vadum Iacob using the slenderness index of the third metapodial (Figs. 7.8–7.9) because of the overlap between all three equid species. Therefore,

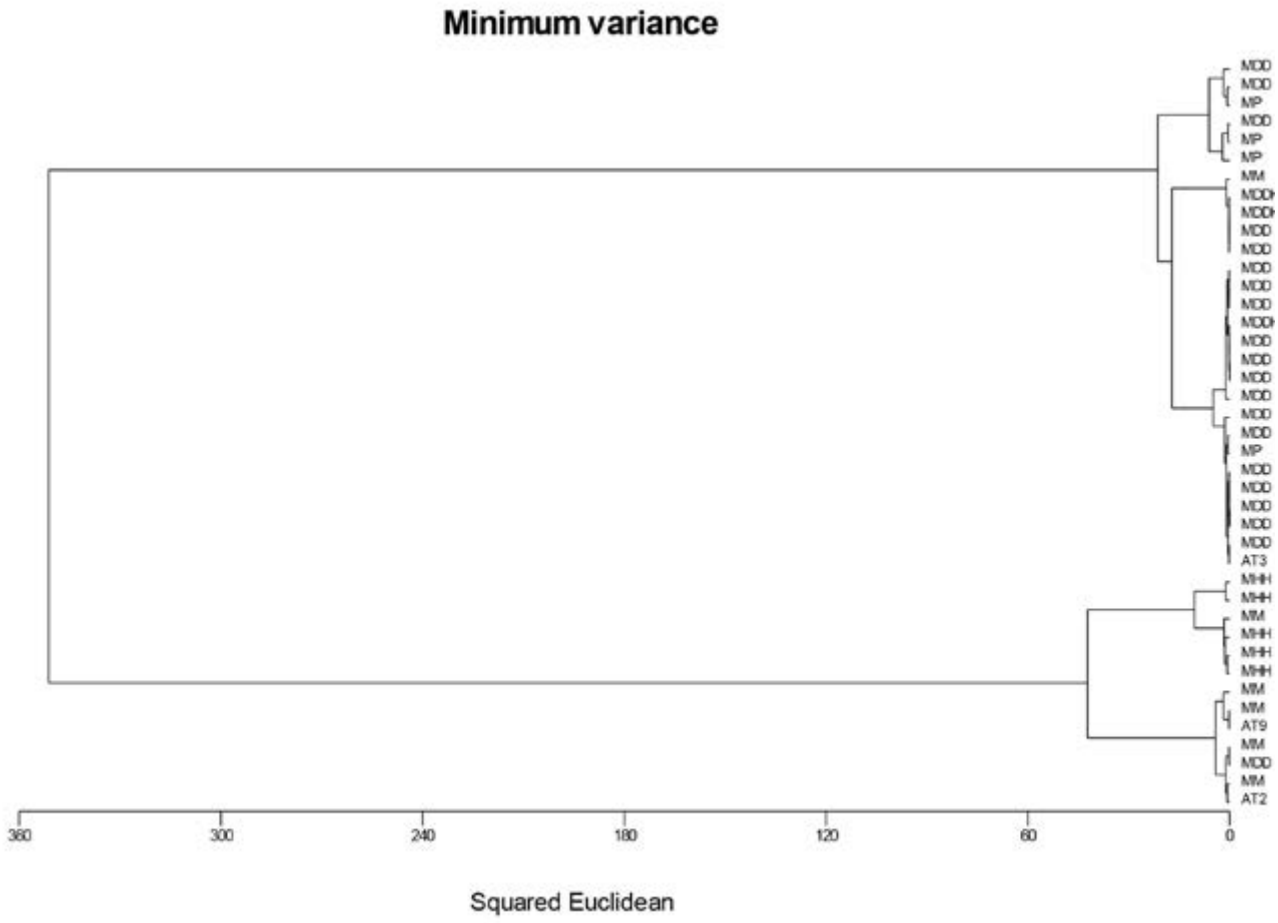



**Figure 7.7.** Cluster analysis of the metatarsal of the Vadum Iacob equids compared to modern equids from the mammalian comparative collections of the Hebrew University of Jerusalem (HUJI) and data from Eisenmann and Beckouche (1986). HUJI: HH = Modern horse from HUJI; MDDH = Modern domestic donkey from HUJI; MMH = Modern mule from HUJI. Eisenmann and Beckouche (1986): MP = Modern pony; MHH = Modern heavy horse; MDD = Modern domestic donkey; MM = Modern mule.

individual regression lines with 95% confidence intervals were used for each modern species and compared to the ancient data. Results of this comparison show that equid AT2 is a bit smaller than a horse, larger than a donkey and fits the size and proportions of a mule. Equid AT3 fits the size and proportions of a donkey and is much smaller than a horse. Equid AT9 fits both a horse and a mule in size and proportions and is much larger than a donkey. Equid AT6 fits the size and proportions of a mule, is much larger than a donkey and is smaller and broader than a horse. Equid AT7 fits the size and proportions of a horse or perhaps a large mule and is much larger than a donkey. Equid AT8 fits the size and proportions of both a horse and a mule and is much larger than a donkey.

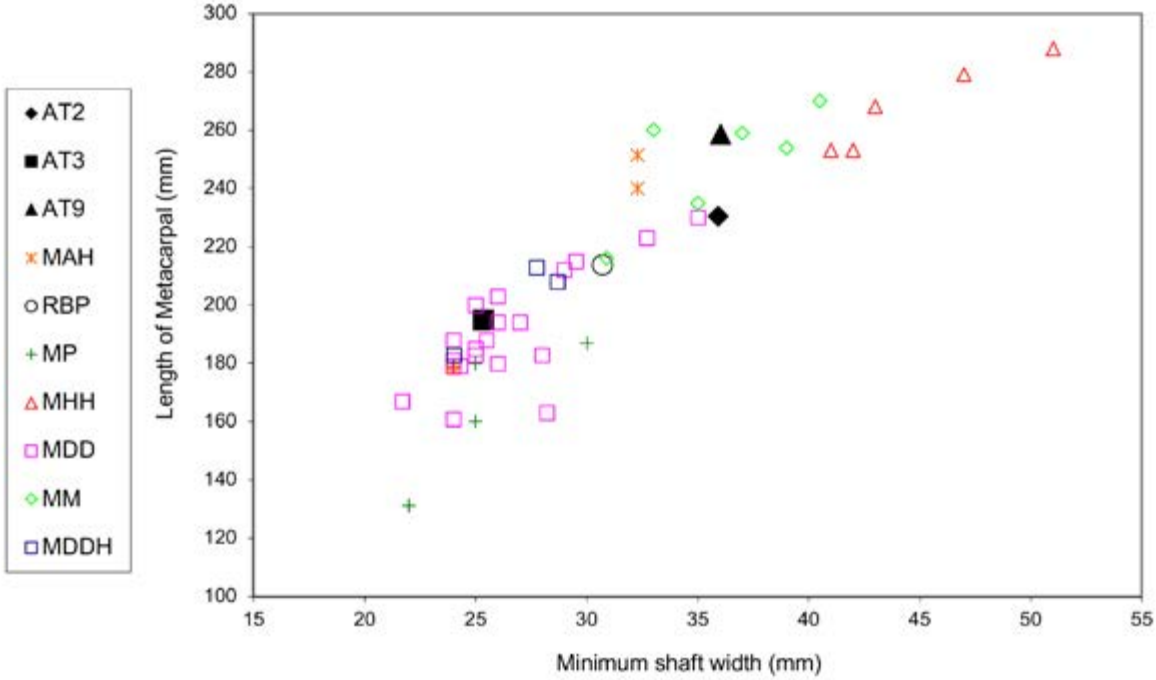



**Figure 7.8.** Graph showing slenderness of the metacarpal (maximum length versus minimum shaft width in mm). MAH = Modern Arab horse; RBP = Romano-British pony; MP = Modern pony; MHH = Modern heavy horse; MDD = Modern domestic donkey; MM = Modern Mule; MDDH = Modern domestic donkey (HUJI).

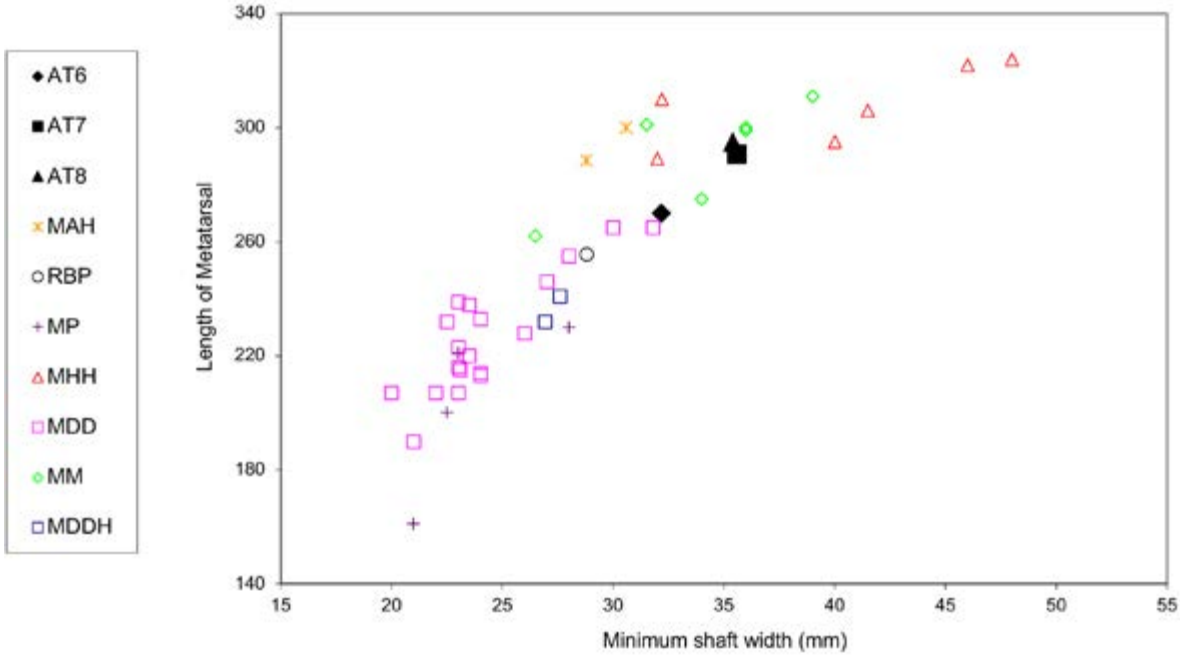



**Figure 7.9.** Graph showing slenderness of the metatarsal (maximum length versus minimum shaft width in mm). Codes are the same as in Fig. 7.8.

## Summary of the identification of the Vadum Iacob equids

Table 7. summarizes the different methods used for identifying the equids. Using a number of methods has advantages when individual specimens are not complete, a common situation in archaeological material. Identification according to morphological characteristics of the cheek teeth provided results similar to the final identification and indicates that this method is the most reliable one (Table 7.2). Cluster analysis of the cheek teeth shows that AT1, AT2, AT5, AT6 and AT9 are horses. Cluster analysis of the metacarpal shows that AT2 and AT9 belong to the mule-horse branch closer to the mule, while AT3 is clustered with the donkey. Cluster analysis of the metatarsal shows that AT6, AT7 and AT8 are clustered in the mule-horse branch closer to the mule.

Analysis of the third metapodial did not reveal a clear pattern that could differentiate between mule and horse in the case of A7, AT8 and A9, but did separate the mules AT2 and AT6 and the donkey AT3. While the withers height estimate is less efficient in the case of mules and horses because of their similar size (AT2, AT6), it can be used for distinguishing a donkey from a horse (AT3). The combination of the methods shows that at Vadum Iacob we have three horses (AT1, AT4 and AT5), one donkey (AT3), two mules (AT2 and AT6), and three equids that are definitely not donkeys but may be mules or horses (AT7, AT8 and AT9).

**Table 7.2.** The identification of the Vadum Iacob equids using various methods.

| ELEMENT | CHEEK TEETH | CHEEK TEETH | THIRD META-CARPAL | THIRD META-TARSAL | THIRD META-CARPAL | THIRD META-TARSAL | LONG BONES | |
|---|---|---|---|---|---|---|---|---|
| METHOD | MORPHOLOG-ICAL CHARAC-TERISTICS | CLUSTER ANALYSES | CLUSTER ANALYSES | CLUSTER ANALYSES | REGRESSION | REGRESSION | WITHERS HEIGHT ESTIMATES | FINAL IDENTIFICA-TION |
| AT1 | Horse | Horse | | | | | | Horse |
| AT2 | Mule | Horse | Mule | | Mule | | Mule/ Horse | Mule |
| AT3 | | | Donkey | | Donkey | | Donkey | Donkey |
| AT4 | Horse | | | | | | | Horse |
| AT5 | Horse | Horse | | | | | | Horse |
| AT6 | Mule | Horse | | Mule | | Mule | Mule/ Horse | Mule |
| AT7 | | | | Mule | | Mule/ Horse | Horse | Mule/ Horse |
| AT8 | | | | Mule | | Mule/ Horse | Horse | Mule/ Horse |
| AT9 | Horse | Horse | Mule | | Mule/ Horse | | Horse | Mule/ Horse |

## Age and sex

Equids AT3, AT4, AT7 and AT8 were found without teeth. Examination of their long bones show that all were fused, denoting an age older than five years at the time of their death.

Examination of both long bone fusion and dental development and attrition for specimens AT1, AT2, AT5, AT6 and AT9 indicated that all these animals were adults. Thus, on the basis of comparison of ageing data for modern and fossil horses, the Vadum Iacob equids were all adult, and aged between five to nine years old at the time of their death.

Unlike other mammals, equids are only slightly dimorphic,[24] so that allometric size did not reveal any obvious pattern for differentiation between males and females in the Vadum Iacob equids. Only three equids (AT2, AT5 and AT9) were found with well-developed canines, making it almost certain that they were males. It seems that the other equids found with skulls are also males, although they are without canines (Table 7.3).

**Table 7.3.** Estimated ages and sex of the Vadum Iacob equids.

| CODE | IDENTIFICATION | YEAR OF EXCAVATION | ELEMENTS | ESTIMATED AGE (YEARS) | SEX |
|---|---|---|---|---|---|
| AT1 | Horse | 1995 | Skull | 6–7 | Male |
| AT2 | Mule | 1996 | All except right fore & hind limb | 5–6 | Male |
| AT3 | Donkey | 1997 | Post cranial | 5+ | Undetermined |
| AT4 | Horse | 1997 | Post cranial | 5+ | Undetermined |
| AT5 | Horse | 1997 | All except right fore & hind limb | 5.5–6 | Male |
| AT6 | Mule | 2000 | All except left fore limb & 2 half hind limb (metatarsal & phalanx) | 7.5–9 | Male |
| AT7 | Mule/Horse | 2002 | Ribs, lumbar vertebrae, pelvis & hind limbs | 5+ | Undetermined |
| AT8 | Mule/Horse | 2002 | Ribs, lumbar vertebrae, pelvis & hind limbs | 5+ | Undetermined |
| AT9 | Mule/Horse | 2002 | Skull, cervical & thoracic vertebrae, ribs & left metacarpal | 6–7 | Male |
| AT10 | Mule/Horse | 2005 | Left hind limbs & 1 right fore limb (not complete) | 5+ | Undetermined |

24 Davis, S.J.M. *The Archaeology of Animals* (New Haven and London, 1987).

## Size

Withers heights are presented in Table 7.4 on the basis of Kiesewalter's factors. Fig. 7.10 shows cluster analyses of withers height estimates for the Vadum Iacob equids compared with withers height from other studies (and see Table 7.5). We can see from the cluster analyses that there are two different groups. One includes the horses, and the other the donkeys and ponies. Equids AT2, AT6, AT7, AT8 and AT9 fall within the horse branch, while equid AT3 falls within the donkey and pony branch.

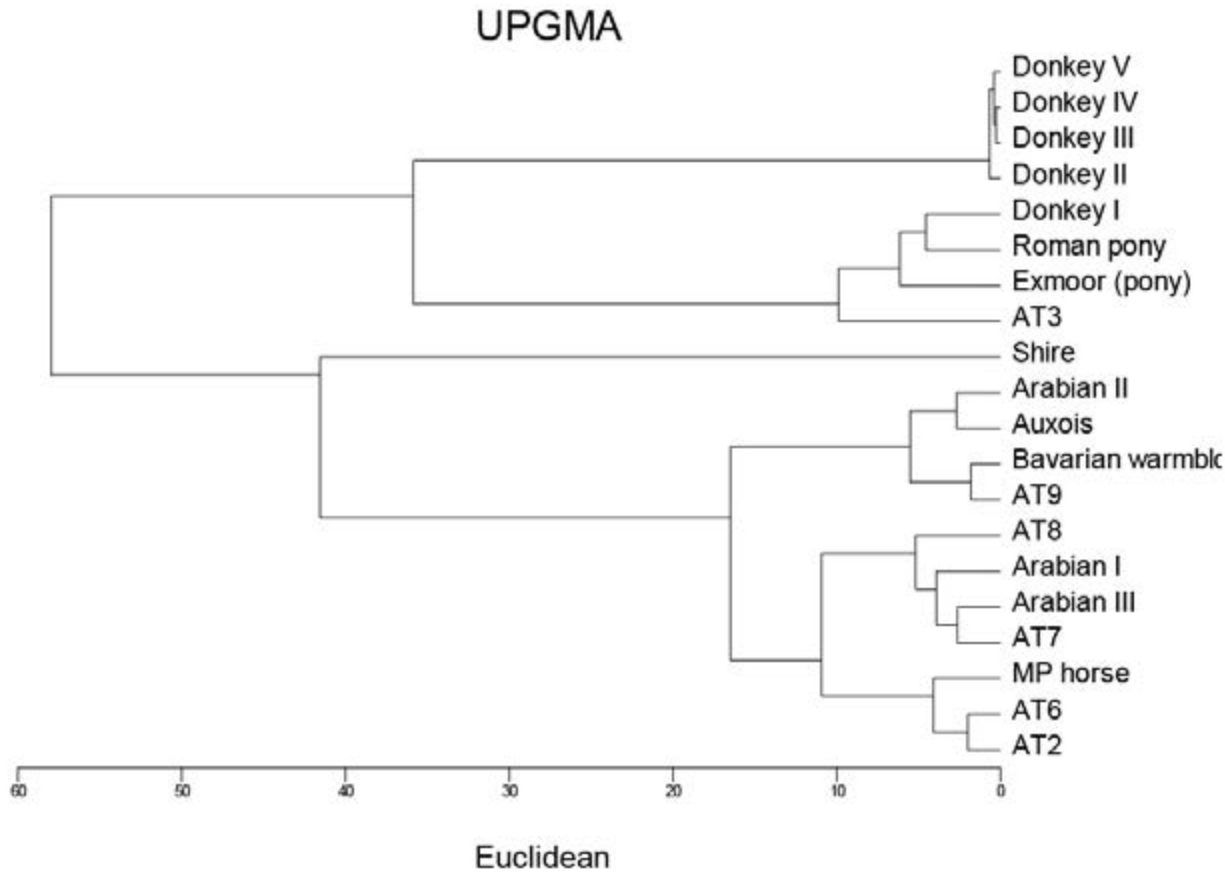



**Figure 7.10.** Cluster analysis of withers height estimates for the *Vadum Iacob* equids compared to other equids (see Table 5 for details).

**Table 7.4.** Withers height estimates based on the length of the long bones, using Kiesewalter's factors (as summarized by von den Driesch and Boessneck, 1974).

| | FORMULA USED | AT2 | AT3 | AT6 | AT7 | AT8 | AT9 |
|---|---|---|---|---|---|---|---|
| Humerus (mm) | GLI x 4.87 | | | 1423.21 | | | |
| Metacarpal (mm) | LI x 6.41 | 1414.69 | 1198.67 | | | | 1587.24 |
| Metatarsal (mm) | LI x 5.33 | | | 1396.46 | 1493.47 | 1521.40 | |
| Range (cm) | | 141.47 | 119.87 | 142.32–139.65 | 149.35 | 152.14 | 158.72 |
| Hand* | | 13.92 | 11.80 | 14.01–13.75 | 14.70 | 14.97 | 15.62 |

* 1 hand = 101.6 mm

**Table 7.5.** Withers height of modern horses.

| NAME | WITHERS HEIGHT (CM) | REFERENCE |
|---|---|---|
| Shire | 180 | Peplow 2002 |
| Auxois | 155–160 | Peplow 2002 |
| Bavarian Warmblood | 160 | Peplow 2002 |
| Arabian I | 145–150 | Peplow 2002 |
| Arabian II (♂) | 152.92–158.33 | Clutton-Brock & Burleigh 1979 |
| Arabian III (♀) | 148.05–151.66 | Clutton-Brock & Burleigh 1979 |
| Exmoor (pony) | 122–130 | Peplow 2002 |
| Roman pony* | 128.33 | Levine, Whitwell and Jeffcott 2002 |
| Donkey I | 125.10 | Eisenmann and Beckouche 1986 |
| Donkey II | 99.90 | Eisenmann and Beckouche 1986 |
| Donkey III | 99.61 | Eisenmann and Beckouche 1986 |
| Donkey V | 99.21 | Eisenmann and Beckouche 1986 |
| Donkey IV | 99.41 | Eisenmann and Beckouche 1986 |
| Migration period horse* | 144 | O'Connor 1994 |

*Estimated withers height of equids from archaeological sites

In Fig. 7.10 we can see that the Shire, one of the largest horses in the world, is separate from the other horses and the distance between those two branches is relatively large. Equids AT2, AT6, AT7 and AT8 are closer to horses. Equids AT2 and AT6 are closer to the small horse from the Migration period (between the fourth and ninth centuries CE in Europe). Equid AT7 is closer to a female Arabian horse. Equid AT9 is closer to a Bavarian Warmblood horse and equid AT8 is on a separate small branch closer to the Arabian horses. In the other cluster (donkeys and ponies) we find equid AT3 on a separate small branch closer to a branch that includes donkeys and ponies. Because of the overlap of mules and horses in withers heights (mules resemble their mother, the mare, in size) it is hard to distinguish between them. We have the same difficulty in the case of donkeys and ponies, whose withers heights overlap.

## Pathology

Detailed research on the skeletal pathology of the Vadum Iacob equids lies beyond the scope of the present chapter. Despite this, there are several outstanding pathologies that can be observed even with the naked eye. Equids AT2, AT6 and AT7 show a proliferation of new bone (exostosis) on the proximal end of the main metatarsal, and on the lateral and medial face of the first and second phalanx (Fig. 7.11). In one case, the fourth metatarsal fused with the proximal end of the metatarsal. This condition may indicate heavy traction on a hard surface. It seems more than likely that equids that were used as draught animals would display this symptom.[25]

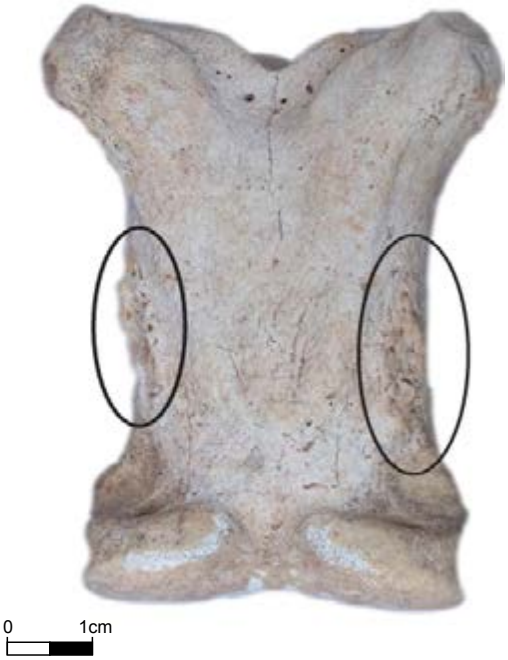



**Figure 7.11.** Volar aspect of a mule's (AT6) 1st phalanx showing proliferation growth of bone (exostosis) over the lateral and medial face (photo by Hadas Motro).

## Discussion

Equid bones are quite rare in contemporaneous archaeological sites in Israel. This rarity can probably be explained by the fact that carcasses of large animals, such as equids, were usually dumped outside settlements or buried quickly in isolated places for sanitary reasons. The chance of finding articulated skeletons in archaeological excavations (and not in a burial site) is therefore very small.

**Where were the equids killed?**

It is difficult to conclude whether the Vadum Iacob equids were killed inside the vaulted building or

25 Baker, J. and Brothwell, D. *Animal Diseases in Archaeology* (London, 1980); Baker, J. R. The study of animal diseases with regard to agricultural practices and man's attitude to his animals. In C. Grigson and J. Clutton-Brock (eds.) *Husbandry in Europe*. BAR International Series 227 (Oxford, 1984), 253–257.

were slain elsewhere and piled together here after the conquest of the site. There is sufficient archaeological evidence to support both scenarios.

The four human remains and some of the equids (donkey AT3, horses AT1, AT4, AT5 and mule AT2) were found in separate localities in the western section of the building, and the other equids (AT6, AT7, AT8 and AT9) were found in another pile, also in the same section (Fig. 7.2).[26] Mule AT2 and equid (mule/horse) AT7 display unnatural positions. Mule AT2 was found prone on its belly with its hind limbs splayed (Fig. 7.12A), and equid AT7 lay on its back with its hind limbs splayed (Fig. 7.13). In both cases, the femurs were disconnected from the pelvis but found in close proximity. Weigelt has already shown that following death, the flexors and extensors contract simultaneously, so that all flexibility and movement become impossible (*rigor mortis*).[27] Weigelt found that the carcass swells enormously in a short time due to intestinal gas, causing the hind limb uppermost during death to rise to a horizontal position or even higher. The forelimb is only slightly raised, because the area around the lungs and pectoral girdle deflates more quickly than the abdominal area. He also noticed that in extreme cases, gas pressure could force the carcass to roll onto its back or even completely turn over.[28] In addition, when the underlying surface is uneven, gravity can cause an unusual position such as limbs stretching out backwards. It should be noted that in the cases Weigelt mentions, the carcasses disintegrated on flat surfaces. In the case of mule AT2, it is possible that it rolled over completely on a flat surface as a result of gas pressure, but its final position on its belly with limbs splayed in opposite directions (Fig. 7.12A) is unnatural, and may have involved human interference. The fact that some of the carcasses were piled together makes it more difficult to accept the "intestinal gas" explanation, and it is more reasonable to assume that the carcasses were intentionally dumped together. Equid AT8, that was found with its right hind limb under the right hind limb of equid AT7 and with its left hind limb on the ribs of equid AT7 (Fig. 7.13), together with the piglet found under equid AT8, supports this assertion. It is very unlikely that equid AT7 rolled onto its back as a result of gas pressure and ended up in this position.

Equids AT8 and AT9 were excavated in the same pile with equid AT7 (Fig. 7.13) and it seems that they were all dumped inside the building after their death. The human individual whose skeleton was found with the left arm under mule AT6, seems also to have been dumped on the same pile.

One can argue that some of the equids and humans were killed inside the vaulted building (AT1, AT3, AT4, AT5 and maybe AT2). Equids (AT6, AT7, AT8, AT9), however, along with one of the humans and perhaps the piglet, were probably dumped in a pile inside the building, this is a more convincing explanation when examining the position of their skeletons.

**Cause of death**

Most of the equids were probably wounded by the arrowheads found scattered around them and died during the battle. The arrowheads' locations indicated that some had been imbedded in the soft tissue between the equids' ribs and near the pelvis

26 See Chapter 8 and also: Mitchell, P. D. Nagar, Y. and Ellenblum, R. Weapon Injuries in the 12th Century Crusader Garrison of Vadum Iacob Castle, Galilee. *International Journal of Osteoarchaeology* 16 (2006): 145–155.

27 Weigelt, J. *Recent Vertebrate Carcasses and their Paleobiological Implications* (Chicago and London, 1989).

28 Weigelt, *Recent Vertebrate Carcasses*.


**Figure 7.12A**. Articulated mule AT2 lying on its belly with limbs splayed in opposite directions (photo by Bouky Boaz).

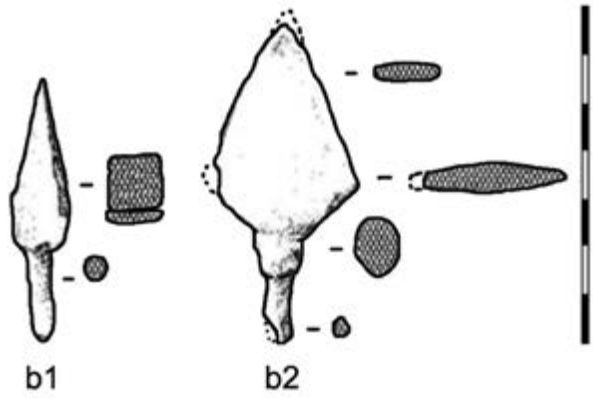



**Figure 7.12B1.** Arrowhead used against humans, indicated by blue dot on figure 7.12C.
**Figure 7.12B2.** Arrowhead specifically designed to be used against horses, indicated by yellow dot on figure 7.12A.

**Figure 7.12C.** Articulated mule AT6 lying on its left side (photo by Hadas Motro).

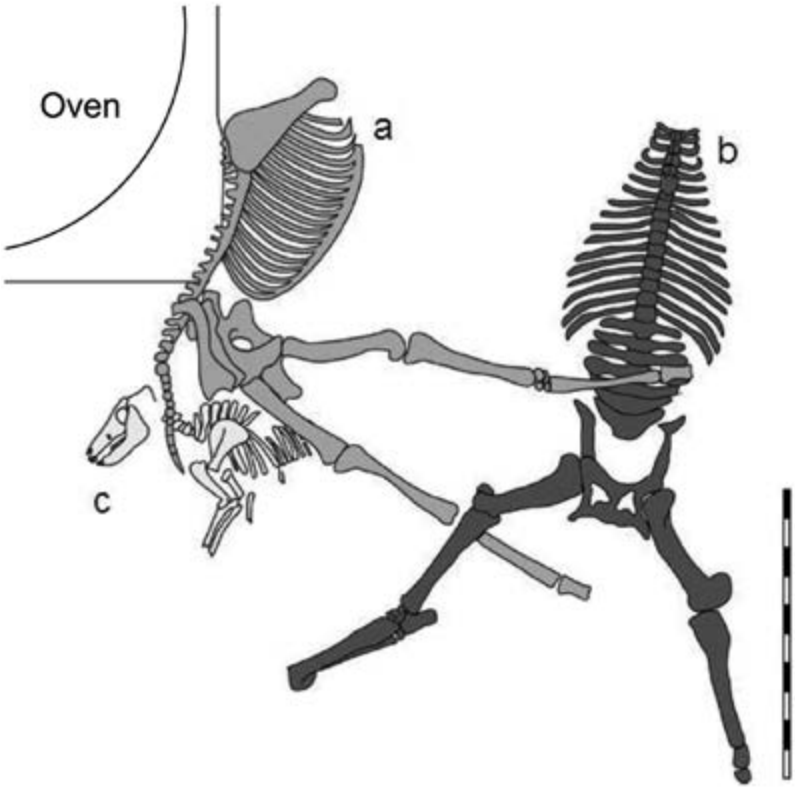



**Figure 7.13.** Two equids piled on top of each other above a piglet: (a) Equid AT8; (b) Equid AT7; (c) piglet (by Hadas Motro)

(Fig. 7.12A–C). The archaeological evidence shows that two kinds of arrowheads were used in Vadum Iacob. One, the more common, was designed to kill human beings. Most of these have a square cross-section and were designed to pierce armour (Fig. 7.12B1). The second arrowhead type has a flat, wide, kite-shaped head, designed to cause greater injury and loss of blood. These kinds of arrowheads were probably intended to kill horses (Fig. 7.12B2).[29] The second arrowhead type was relatively rare (about 10% of all arrowheads found in situ) and most of them were associated with mule AT2. The Muslim sources describing the siege clearly state that the Muslim warriors refrained from shooting the valuable horses, as they preferred to take them, as well as other livestock, as booty. The second type of arrowhead was apparently used only on the battlefield, when the need to overcome mounted knights was essential. Such an arrowhead could knock down knights, preventing them from participating in the battle, as most of them were unable to remount their horses. Our findings, however, suggest the Muslim forces hesitated to use this horse-killing weapon when it was not necessary, except once, when it was used to kill a mule. We should also take into consideration

29 Raphael, K. and Tepper, Y. The Archaeological Evidence from the Mamluk Siege of Arsuf. *Mamluk Studies Review* 9/1 (2005): 85–100. See Chapter 5.

that this mule could have belonged to the Muslims and have been killed by the Crusaders, because it is difficult to tell the difference between Muslim and Crusader arrowheads.

**Where are the 3rd phalanges?**

One of the strangest phenomena in the investigation of the equids was the lack of the 3rd phalanges and in some cases also the absence of the 2nd phalanges. Cut marks (Table 7.6; Fig. 7.14) were found on the distal anterior side of the horses' 1st phalanx (in the cases when 2nd and 3rd phalanges were missing), and on the distal anterior side of the 2nd phalanx (in the cases where only the 3rd phalanx was missing). These facts, combined with the relative lack of horseshoes from the Frankish strata (only eight horseshoes were found at the site; four of them were from the Frankish strata), suggest that the Muslims possibly kept all the iron horseshoes as booty, presumably for reuse. It seems that before the Muslims dumped the carcasses, they hastily gathered all the horseshoes together with other iron equipment. There was no need for skilled craftsmen to remove the horseshoes and it was much more practical to cut the phalanges off the dead equids, to be later separated from the horseshoes. Historical sources support this hypothesis, since they mention that the Muslims took as booty all riding equipment, together with armour and weapons. This is further supported by the fact that donkey AT3 phalanges had no cut marks, since donkeys usually had no horseshoes. Cut marks occurred also on the mules' phalanges.

**Table 7.6.** Cut marks over 1st and 2nd phalanges of Vadum Iacob equids.

| BONE NO. | EQUID | ELEMENT | SIDE | PLACE OF CUT |
|---|---|---|---|---|
| 02–160 | AT8 | 2nd phalanx | L | Numerous fine marks on the phalanx condyle near the proximal end of the anterior aspects, and on the lateral and volar aspects of the distal condyle |
| 02–14 | AT9 | 1st phalanx, hind | L | Fine mark on the distal anterior condyle on the volar aspect |
| 96–26 | AT2 | 1st phalanx, hind | L | Over the distal condyles and on the anterior aspect near the distal condyle |
| 96–100 | AT2? | 1st phalanx, fore | | On the distal condyles |
| 02–224 | AT7 | 1st phalanx, fore | L | Fine mark over the distal anterior condyle on the volar aspect |
| 02–174 | AT8 | 1st phalanx, hind | R | On the distal condyle on the anterior, lateral, and volar aspects |
| 97–168 | AT4/5 | 1st phalanx | | On the distal condyle of the anterior aspect and over the phalanx body on the volar aspect |
| 97–169 | AT4/5 | 1st phalanx | | On the lateral aspect near the distal condyle |

## The functions of the Equids

The archaeological excavation showed that the site was still under construction when it was destroyed, and one can assume that the mules were used for hauling construction materials and masonry to the site. This is supported by the presence of pathologies on the metapodials and phalanges of the


**Figure 7.14.** Left 2nd phalanx of equid AT8 from Vadum Iacob with numerous cut marks (photo by Hadas Motro).

Vadum Iacob mules, which indicate their use as draught animals. The fact that the mules were all adults further supports this conclusion.

The mule, which is the progeny of a female horse and a male donkey, resembles a donkey but is the size of a horse.[30] This hybrid is better adapted to difficult terrain and weather than its parents and is more resistant to disease.[31] The mule is stronger than the donkey and less shy than the horse, making it the most suitable pack animal for hard work.

The nearby quarry that supplied the masonry for the curtain walls had a levelled road that led up to the building area. This suggests the use of pack animals harnessed to a cart. The scarcity of articulated cattle skeletons (only one, whose gender could not be determined) and the high percentage of articulated adult mules in Vadum Iacob (apparently five out of nine) support the assumption that mules, rather than oxen, were used in the construction operation. If oxen were used, they may have been taken away by the Muslims.

The single donkey found at the site has very clear signs of a pathology caused by carrying heavy loads. Historical sources document the donkey as a pack animal in the Frankish kingdom.[32] Apparently, donkeys and mules were used for carrying food and water to the castle as well as for other light transportation tasks.

Horses played an important role in Frankish life and warfare.[33] The Levantine horse apparently did not substitute for cattle in farming and other agricultural tasks, such as ploughing, as horses did in western Europe in the tenth century; it was used for transportation and warfare only.[34] The adult, and apparently male, horses from Vadum Iacob may have served as warhorses for the knights and for transportation. Recent studies based on western European documents concluded that the Crusader warhorses were comparatively small.[35] So far, the measurements

30 Clutton-Brock, J. *Horse Power*. Natural History Museum Publications (Oxford, 1992).
31 Epstein, H. Ass, mule and onager. In I. L. Mason (ed.) *Evolution of domesticated animals* (London, 1984), 174–184.
32 Boas, A. J. *Crusader Archaeology — The Material Culture of the Latin East* (London and New York, 1999).
33 Clutton-Brock, J. *Horse Power* (Oxford, 1992); Hyland, A. *The Horse in the Middle Ages* (Wiltshire, 1999); Hyland, A. *The Medieval Warhorse from Byzantium to the Crusades* (Suffolk, 1994); Boas, *Crusader Archaeology.*
34 Clutton-Brock, *Horse Power*; Hyland, *The Horse*; Hyland, *The Medieval Warhorse*; Boas, *Crusader Archaeology*.
35 France, J. Technology and the Success of the First Crusade. In Y. Lev (ed.) *War and Society in the Eastern Mediterranean, 7th-15th Centuries* (Leiden, 1997), 163–176; Davis, *The Archaeology of Animals*; Davis, R.H.C. *The Medieval Warhorse*: *Origin, Development and Redevelopment* (London, 1989); Rackham, D. J. Appendix: skeletal evidence of medieval horses

of the equid skeletons in Vadum Iacob show that the horses that were found in Vadum Iacob were a bit larger than the average modern Arabian horse. It is also possible that the skeletons excavated belonged to Muslims, who used the Arabian horse as a warhorse.

## Conclusions

The Muslims probably dumped the nine adult and apparently male equids of Vadum Iacob, killed during the battle of August 1179, in the only completed building at the site. It is suggested that the mules were used for transporting stones from the quarry nearby to the construction site. It is likely that horses (there were 80 knights in the castle) served as warhorses while the donkeys and mules were used for carrying lighter loads. The presence of a few adult male mules and a donkey with pathological symptoms supports the archaeologists' assumptions that the castle was still under construction at the time of the battle. Further research is needed to identify species and breeds. Analysis of ancient DNA may help developed this field of research.

### The destruction of the vaulted building

Muslim sources mention specifically that the bodies of the defenders of the castle and the carcasses of the animals were dumped in a deep cistern. The chroniclers, who emphasize this action, ignored the few individuals and equids that were piled together under the vaulted building. When recounting the outburst of the plague, the sources also relate that the retreating Muslims destroyed the castle, before abandoning the site. The view that the vault was destroyed intentionally at the end of the battle and did not collapse as a result of the earthquake that bisected the castle twenty-three years later,[36] is supported by the state of preservation of the bones. Had the vault's heavy blocks hit dry bones, stripped of the muscles and soft tissues that protected them, the skeletons would probably not have been preserved, as the equid bones would have been crushed. Moreover, if the carcasses had not been covered immediately after the animals' death, scavenger marks would have been apparent.

### The function of the vaulted building

As can be seen from Fig. 7.2, the vaulted building was located in the southeastern corner of the castle, east of the main gate. The eastern and southern walls were part of the curtain wall. Most of the northern and western aspects of the building probably opened onto a central courtyard and to the main gate.

A domed oven occupied the southeastern corner of the building. Outside the oven, adjacent to its western wall, a trough was uncovered, perhaps used for feeding animals. Tens of similar troughs were found in the nearby quarry, and another trough was found next to the main gate. The troughs were undoubtedly used to water and feed pack animals. Along the southern wall of the building there was a large stage (0.8 m high and 10.7 x 3.4 m wide and deep) with small square niches that were made of crushed lime and fine basalt rectangular slabs. The floor of the building was not levelled and the part

from London sites. In J. Clark (ed.) *The Medieval Horse and its Equipment, c.1150– c.1450* (London, 1995) 169–174.

36 The epicentre of this earthquake was located in Vadum Iacob, which was built on the active line of the Dead Sea Transform, in itself a segment of the Syrian African Rift Valley. See: Ellenblum, R., Marco, S., Agnon, A., Rockwell, T. and Boas, A. Crusader castle torn apart by earthquake at dawn, 20 May 1202. *Geology* 26/4 (1998): 303–306. And see Chapter 18.

that was near the stage was more than 0.6 m higher than the section closer to the oven. A moderate slope connected the two floor levels.

The main gate of the fortress nearby, the numerous animal skeletons, the troughs in the building, the number of pitchers and the burnt cereals, support the assumption that this structure was used, at least temporarily (until the completion of the construction), for housing livestock and as a storeroom.

However, the idea that part of the vaulted building was used as a permanent stable should be examined carefully. In other Frankish sites, specific buildings were assigned to accommodate animals. This type of building comprises several long and narrow individual cells, each with a trough. Frankish stables were used not only to lodge horses, but were designed for all sorts of livestock, such as mules, cows, oxen, and even sheep. Examples can be found in ʻAtlit, Nabi Samwil (Mons Gaudii) and similar installations are associated with fortifications in Horvat Manot, Tayibe and Yazur. In most of these cases, however, the stables were located outside the castles.[37]

The vaulted building at Vadum Iacob is not designed in this manner: it is not divided into cells and is located inside the castle itself and in close proximity to the main gate. It is possible that the building was used for stabling expensive and important mounts and livestock, while the construction of the castle was undertaken.

## Acknowledgements

This chapter is based on Motro's MA thesis, written under the supervision of the late Prof. Ronnie Ellenblum and Prof. Rivka Rabinovich. The chapter is dedicated to the memory of Prof. Ellenblum, who did everything to ensure that the excavation of the equids and the research about them was carried out in the most professional way, and he did all of this with great passion.

We would like to thank the following people for their assistance: Liora K. Horwitz, for sharing knowledge and thoughts and for her constructive advice; Miki Golan, for significant assistance in all the excavation seasons; Gali Beiner, for her work in conserving the equid skeleton, without which this research would not have been possible; Professor Uzi Motro, for his immense help with the statistical analyses and general advice; Miri Shmida and Tamar Sofer (The Department of Geography, The Hebrew University Jerusalem) for their illustrations and figures; Doron Sohari, for help with the illustrations of Figure 7.13; Ester Lachman, for editing the text; Suzan MacMinn for the reconstruction drawing of the equids, done under the auspices of Prof. G. Kahila Bar-Gal, Koret School of Veterinary Science, The Hebrew University of Jerusalem; Miriam Belmaker, for her many useful discussions; Kate Raphael, who excavated the vaulted building, provided important and helpful information about the excavation, and helped with the technical aspects of this paper; Yoav for his patience, support and valuable advice; and all the people who took part in the excavations at Vadum Iacob over the years, as workers or as volunteers.

37 Johns, C. N. Excavations at Pilgrims' Castle, ʻAtlit (1932–3): Stables at the South-West of the Suburb. *QDAP* 5 (1936): 31–60; Benvenisti, M. *The Crusaders in the Holy Land* (Jerusalem, 1976).

## Appendix 7.1. References for data from Figs. 5–9.

| CODE | FULL NAME | REFERENCE | ELEMENTS |
|---|---|---|---|
| MAH | Modern Arab horse | Clutton-Brock and Burleigh 1979 | Teeth and metapodial |
| RBP | Romano-British pony | Levine, Whitwell and Jeffcott 2002 | Teeth and metapodial |
| MP | Modern pony | Eisenmann and Beckouche 1986 | Metapodial |
| MHH | Modern heavy horse | Eisenmann and Beckouche 1986 | Metapodial |
| MDD | Modern domestic donkey | Eisenmann and Beckouche 1986 | Metapodial |
| MM | Modern mule | Eisenmann and Beckouche 1986 | Metapodial |
| MDDH | Modern domestic donkey HUJI | Measured by Motro in HUJI collection | All body parts |
| HH | Horse HUJI | Measured by Motro in HUJI collection | All body parts |
| MMH | Modern mule HUJI | Measured by Motro in HUJI collection | All body parts |

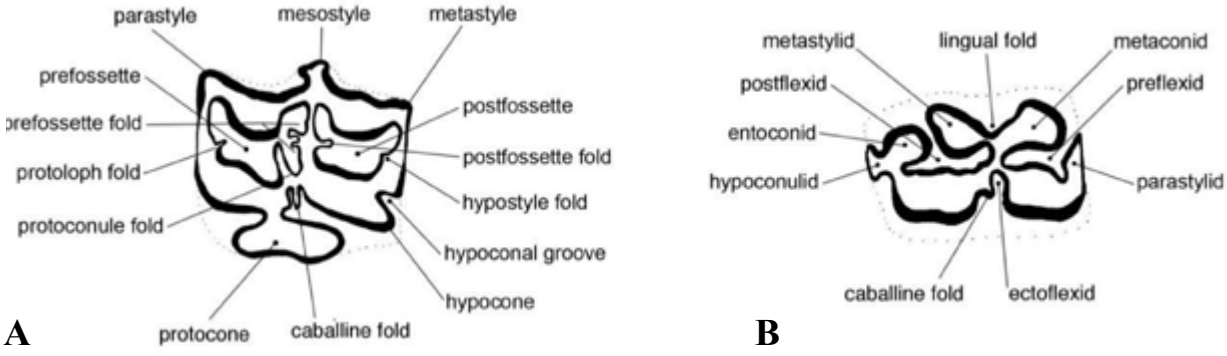



**Fig. 7.15 A.** Occlusal view of a lower cheek tooth. **B.** Occlusal view of an upper cheek tooth.


**Figure 7.16.** Codes of the degree to which the extoflexid penetrates between the pre- and postflexid in the lower molars.

# Appendix 7.2. Tooth measurements taken from the Vadum Iacob equids

## Upper cheek teeth

| EQUID NO. AND SIDE | TOOTH | MEASUREMENTS | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| AT1 L | P2 | 43.41~ | 35.9 | | |
| | P3 | 63.73~ | 29.32 | | |
| | P4 | | 28.78 | | |
| | M1 | 60.13 | 25.52 | 12.4 | 26.83 |
| | M2 | 72.4 | 26.91 | 13.84 | 25.96 |
| | M3 | 75.59 | 25.9 | 13.22 | 18.69 |
| AT1 R | P2 | 44.31~ | 36.24 | | |
| | P3 | 77.07 | 28.91 | | |
| | P4 | 62.87 | 28.03 | 12.26 | 29.74 |
| | M1 | 62.31 | 25.4 | 12.58 | 27.04 |
| | M2 | 74.76 | 27.29 | 13.68 | 25.81 |
| | M3 | 76.37 | 25.65 | 13.28 | 19.94 |
| AT2 L | P2 | 59.51~ | 37.86 | 10.44 | 26.98 |
| | P3 | 74.73~ | 32.58 | 15.24 | 27.95 |
| | P4 | 85.45 | 27.51 | 14.6 | 25.05 |
| | M1 | 73 | 27.31 | 14.31 | 25.46 |
| | M2 | 87.26 | 29.68 | 15.25 | 23.57 |
| | M3 | 82.26~ | | 11.47 | 16.28~ |
| AT2 R | P2 | 64.13 | 38.1 | 10.48 | 26.04 |
| | P3 | 74.37~ | 32.1 | 14.61 | 27.28 |
| | P4 | 86.16 | 27.41 | 14.56 | 24.63 |
| | M1 | 73.58 | 27.39 | 14.02 | 25.76 |
| | M2 | 86.27 | 29.54 | 16.04 | 24.46 |
| | M3 | 82.59~ | | 11.8 | 15.18 |
| AT5 L | P2 | 58.97~ | 36.74 | 10.05 | 26.62 |
| | P3 | 78.29~ | 30.46 | 13.65 | 27.24 |
| | P4 | 87.51 | 27.5 | 14.45 | 24.4 |
| | M1 | 69.77~ | 27.03 | 13.17 | 26.06 |
| | M2 | 83.46~ | 27.93 | 14.73 | 24.42 |
| | M3 | 83.47 | 25.41 | 14.54 | 18.42 |

| EQUID NO. AND SIDE | TOOTH | MEASUREMENTS | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| AT5 R | P2 | 60.97~ | 37.67 | 10.06 | 26.22 |
| | P3 | 77.02~ | 30.75 | 12.86 | 26.69 |
| | P4 | 85.77~ | 27.31 | 13.64 | 25.03 |
| | M1 | 70.48~ | 26.67 | 13.01 | 26.57 |
| | M2 | 82.36~ | 27.99 | 14.91 | 24.18 |
| | M3 | 82.76 | 24.87 | 14.97 | 18.96 |
| AT6 L | P2 | 42.41 | 36.59 | 8.02 | 24.66 |
| | P3 | 54.32 | 28.62 | 9.56 | 26.36 |
| | P4 | 61.01 | 28.34 | 9.95 | 26.32 |
| | M1 | 56.8? | 24.5 | 9.8 | 23.91 |
| | M2 | 67.06 | 25.41 | 10.95 | 23.73 |
| | M3 | 70.28 | 26.87 | 12.81 | 19.25 |
| AT6 R | P2 | | | | |
| | P3 | 52.11 | 28.65 | 9.46 | 26.07 |
| | P4 | 63.11 | 29.13 | 10.3 | 26.6 |
| | M1 | 56.92~ | 24.46 | 9.92 | 23.71 |
| | M2 | 61.7 | 25.41 | 11.08 | 23.91 |
| | M3 | 68.53 | 27.19 | 12.77 | 19.63 |
| AT9 L | P2 | 38.02 | 38.9 | 8.79 | 25.71 |
| | P3 | | 32.27 | 11.12 | 26.44 |
| | P4 | 77.02 ~ | 30.34 | 12.02 | 27.08 |
| | M1 | 65.24 | 25.61 | 11.81 | 25.87 |
| | M2 | 72.14 ~ | 26.58 | 12.7 | 25.73 |
| | M3 | 80.24 | 28.59 | 12.65 | 20.69 |
| AT9 R | P2 | 55.14 | 39.86 | 8.65 | 26.51 |
| | P3 | | | | |
| | P4 | 62.05 | 30.39 | 10.39 | 27.44 |
| | M1 | 57.14 | 25.89 | 11.67 | 26.91 |
| | M2 | 72.59~ | 26.04 | 13.03 | 25.95 |
| | M3 | 79.64 | 28.05 | 12.77 | 21.3 |

Note: All measurements are after Eisenmann et al., Methodology. The measurements are given in mm.
~ indicates estimated measurements.

## Lower cheek teeth

| EQUID NO. | SIDE | TOOTH | MEASUREMENTS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| AT1 L | | P2 | 39.93~ | 30.42 | 8.51 | 16.07 | 16.72 | 9.45 |
| | | P3 | 68.05 | 27.31 | 8.91 | 17.17 | 14.36 | 15.75 |
| | | P4 | 80.56 | 28.27 | 8.81 | 17.21 | 13.64 | 17.03 |
| | | M1 | 64.28~ | 25.82 | 8.42 | 14.9 | 9.87 | 14.52 |
| | | M2 | 77.79 | 26.17 | 8.23 | 13.61 | 10.37 | 14.01 |
| | | M3 | 79.4 | 31.71 | 8.71 | 13.45 | 12.23 | 12.53 |
| AT1 R | | P2 | 37.44 | 30.09 | 8.23 | 15.03 | 16.45 | 9.5 |
| | | P3 | 66.6 | 26.44 | 9.34 | 17.73 | 14.42 | 15.7 |
| | | P4 | 77.8 | 28.05 | 8.37 | 16.66 | 14.27 | 15.94 |
| | | M1 | 66.40~ | 25.36 | 8.69 | 14.52 | 10.18 | 14.64 |
| | | M2 | 78.29 | 26.16 | 8.29 | 13.15 | 10.76 | 13.87 |
| | | M3 | 75.56 | 32.07 | 9.03 | 14.07 | 11.76 | 13.16 |
| AT2 L | | P2 | 50.96 | 34.75 | 9.44 | 15.99 | 17.59 | 11.61 |
| | | P3 | 64.85 | 30.7 | 10.9 | 16.61 | 14.73 | 14.98 |
| | | P4 | 63.57 | 29.5 | 9.43 | 14.91 | 13.93 | 14.16 |
| | | M1 | 72.29 | 28.2 | 9.39 | 14.47 | 12.16 | 13.3 |
| | | M2 | 72.61 | 30.32 | 9.43 | 14.17 | 12.75 | 12.91 |
| | | M3 | 55.67 | 22.18 | 8.91 | 10.95 | | 10.38 |
| AT2 R | | P2 | 44.89~ | 33.61 | 8.54 | 14.11 | 18.12 | 12.75 |
| | | P3 | 62.99 | 30.22 | 10.38 | 16.36 | 15.25 | 15.89 |
| | | P4 | 62.25 | 30.86 | 8.97 | 15.04 | 14.06 | 14.53 |
| | | M1 | 76.57 | 27.85 | 9.46 | 14.16 | 12.51 | 13.47 |
| | | M2 | 69.5 | 28.84 | 9.34 | 14.1 | 13 | 13.11 |
| | | M3 | 54.08 | 22.23 | 8.95 | 11.06 | | 9.97 |
| AT5 L | | P2 | 57.6 | 31.98 | 8.21 | 14.67 | 15.68 | 12.53 |
| | | P3 | 70.69~ | 29.04 | 10.25 | 15.99 | 14.23 | 15.21 |
| | | P4 | 84.26~ | 27.49 | 9.57 | 13.49 | 12.2 | 13.38 |
| | | M1 | 73.14 | 27.64 | 9.68 | 14.27 | 11.61 | 15.71 |
| | | M2 | 80.27~ | 27.17 | 9.53 | 13.07 | 12.45 | 13.41 |
| | | M3 | 77.84~ | 29.83 | 8.74 | 11.39 | 10.44 | 10.78 |
| AT5 R | | P2 | 62.08~ | 31.51 | 9.25 | 15.12 | 15.33 | 12.47 |
| | | P3 | 73.29~ | 29.19 | 9.64 | 16.3 | 14.17 | 15.25 |
| | | P4 | 84.29~ | 26.91 | 8.89 | 13.38 | 12.07 | 12.92 |
| | | M1 | 78~ | 26.82 | 9.75 | 13.93 | 11.8 | 15.66 |
| | | M2 | 83.13~ | 27.34 | 9.61 | 13.1 | 12.12 | 13.22 |
| | | M3 | 77.13~ | 29.58 | 8.42 | 11.32 | 10.43 | 10.79 |

| EQUID NO. | SIDE | TOOTH | MEASUREMENTS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| AT6 L | | P2 | 35.88~ | 30.27 | 6.15 | 17.3 | 14.71 | |
| | | P3 | 45.56 | 26.75 | 7.55 | 17.43 | 12.66 | 15.27 |
| | | P4 | 58.4 | 26.18 | 8.16 | 16.52 | 12.26 | 15.11 |
| | | M1 | 46.03~ | 24.99 | 7.36 | 12.98 | 8.43 | 13.46 |
| | | M2 | 56.25 | 24.49 | 7.34 | 12.66 | 8.63 | 12.52 |
| | | M3 | 51.09 | 29.94 | 7.5 | 12.44 | 10.03 | 12.57 |
| AT6 R | | P2 | 43.37~ | 30.49 | 6.02 | 17.23 | 14.87 | 11.91 |
| | | P3 | 44.76~ | 27.18 | 8.3 | 18.3 | 12.92 | 15.91 |
| | | P4 | 59.62 | 26.8 | 8.74 | 17.19 | 11.85 | 15.16 |
| | | M1 | 59.13~ | 25.19 | 7.15 | 13.26 | 8.99 | 13.29 |
| | | M2 | 69.62~ | 24.43 | 7.57 | 13.27 | 9.36 | 12.97 |
| | | M3 | 63.61~ | 30.57 | 8.05 | 12.63 | 11.04 | 12.36 |
| AT9 L | | P2 | | | | | | |
| | | P3 | | | | | | |
| | | P4 | 72.8 | 28.49 | 8.97 | 17.17 | 12.96 | 17.97 |
| | | M1 | | 27.08 | 9.19 | 15.14 | 9.52 | 14.31 |
| | | M2 | | 26.86 | 8.79 | 13.84 | 9.89 | 15.12 |
| | | M3 | 71.26 | 32.84 | 9.79 | 14.96 | 9.69 | 12.45 |
| AT9 R | | P2 | 53.76 | 33.67 | 8.53 | 16.12 | 17.89 | 9.02 |
| | | P3 | | 29.22 | 9.84 | 17.87 | 14.69 | 16.57 |
| | | P4 | | 28.9 | 9.34 | 16.86 | 13.07 | 17.9 |
| | | M1 | | 26.06 | 8.62 | 14.89 | 9.67 | 14.41 |
| | | M2 | | 27 | 8.79 | 13.78 | 9.96 | 14.46 |
| | | M3 | 73.37 | 34.04 | 10.5 | 15.41 | 9.65 | 13.12 |

Notes: All measurements are after Eisenmann et al., Methodology. The measurements are given in mm.
~ indicates estimated measurements.

## Appendix 7.3. Post cranial measurements of the equids from Vadum Iacob

| EQUID | ELEMENT | SIDE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT2 | Scapula | R | | 72.22 ~ | 103.53 | 58.68 | 52.79 | | | | | | | | | | | |
| | Humerus | R | | | | | | | 81.97 | | 52.84 | 39.74 | 49.24 | | | | | |
| | Radius | R | 365 | 360 | 42.83 | 32.51 | 83.49 | 42.85 | 92.3 | 68.51 | 41.83 | 82.02 | 33.26 | 17.61 | | | | |
| | Ulna | R | | 91.76 | 50.82 | 50.11 | 67.01 | | | | | | | | | | | |
| | Metacarpal | R | 230.5 | 220.7 | 35.91 | 27.01 | 53.85 | 34.32 | 40.91 | 18.7 | 5.45 | 52.6 | 50.47 | 39.98 | 31.23 | 33.75 | | 8.37 |
| | Femur | R | 430 | 393 | 46.98 | 53.85 | 124.15 | 106.7 | 99.28 | 130.2 | 69.43 | 58.97 | | | | | | |
| | Tibia | L | | | | | | | | | 52.97 | | | | | | | |
| | Tibia | R | | 359 ~ | 44.15 | 36.07 | 101.63 | 100.1 | 80.31 | 49.70 ~ | 69.56 ~ | | | | | | | |
| | Astragalus | L | 65.07 | 67.76 | 30 | 64.78 | 53.84 | 36.78 | 57.94 | | | | | | | | | |
| | Astragalus | R | 65.06 | 64.84 | 30.25 | 65.01 | 54.03 | 36.93 | 59.46 ~ | | | | | | | | | |
| | Calcaneum | L | 121.5 | 84.91 | 19.82 | 29.88 | 51.89 | 59.74 | 54.64 | | | | | | | | | |
| | Calcaneum | R | | | 20.4 | | | | 56.19 ~ | | | | | | | | | |
| | Metatarsal | L | | | | | | | | | | | | 39.46~ | 29.24 | | | |
| | 1st phalanx | R | 89.85 | 80.69 | 33.83 | 56.82 | 40.83 | 45.44 | 43.66 | 26.21 | 53.12 | 71.2 | 68.79 | 19.79 | 20.13 | | | |
| | 1st phalanx | L | 89.15 | 80.05 | 33.89 | 57.27 | 41.2 | 46.2 | 44.06 | 25.48 | 50.66~ | | | | | | | |
| | 2nd phalanx | R | 52.02 | 40.57 | 42.79 | 52.1 | 33.45 | 49.16 | | | | | | | | | | |
| AT97 | Humerus | R | | | | 46.72 | 53.05 | | | | | | | | | | | |
| | Humerus | L | | | | 36.02 | 45.51 | | | 77.99 | 89.98 | 52.25 | 36.9 | 43.47 | | | | |
| | Humerus | R | | | | 37.48 | 51.67 | | | | | | | | | | | |
| | Radius | R | | | | | | 85.1 | 46 | 88.75 | | | | | | | | |
| | Radius | L | | | | | | | | | 65.61 | 41.41 | 80.81 | 26.67 | 17.17 | | | |
| | Radius | L | | | | | | | | | 64.71 | 39.56 | 78.3 | 26.86 | 16.71 | | | |
| | Radius | R | | | | | | | | | | | 77.16 ~ | | 17.31 | | | |
| | Radius | L | | | | | | | | | 43.11 | 25.36 | 53.36 | 19.55 | 9.99 | | | |
| | Radius | L | | | | 40.71 | 33.31 | | 42.51 | | | | | | | | | |
| | Radius | R | | | | | | 72.39 ~ | 39 | | | 39.35 | | 26.75 | | | | |
| | Ulna | L | | | | | 50.12 | 65.13 | | | | | | | | | | |
| | Ulna | R | | | | 41.53 | 51.94 ~ | 65.49 | | | | | | | | | | |

| EQUID | ELEMENT | SIDE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metacarpal | R | | | | 37.43 | 28.37 | | | | | | | | | | | |
| | Metacarpal | R | 195 | 187 | | 25.36 | 19.81 | 40.23 | 27.98 | 32 | 11.45 | 4.77 | 37.76 | 36.29 | 27.37 | 21.62 | 24.86 | |
| | Metapodial | | | | | | | | | | | | 52.99 | 54.9 | | 31.9 ~ | 31.55 | |
| | Femur | R | | | | | | | | | 132.63 | | | | | | | |
| | Tibia | R | | 374 | | 43.67 | 38.55 | | | 81.53 | | | | | | | | |
| | Tibia | L | | | | 43.3 | 28.57 | | | 74.67 | 44.2 | | | | | | | |
| | Tibia | L | | | | 28.77 | 19.88 | | | 48.51 | 32.2 | | | | | | | |
| | Astragalus | L | 65.47 | 64.84 | | | | | 35.68 | | | | | | | | | |
| | Astragalus | R | 64.77 | 67.14 | | 31.76 | 71.17 | 58.56 | 37.61 | 58.58 | | | | | | | | |
| | Calcaneum | L | 124.5 | 81.65 | | 22.53 | 35.56 | 57.58 | 58.85 | 58.43 | | | | | | | | |
| | Calcaneum | R | 123.6 | 81.4 ~ | | 22.5 | 35.65 | 56.36 | 60.42 | | | | | | | | | |
| | Metatarsal | L | | | | | | | | | | | 32.98 | 31.96 | 24.55 | 19.22 | 20.81 | |
| | Metatarsal | R | | | | | | | | | | 6.38 | | | | | | |
| | Metatarsal | L | | | | | | | | | | 6.41 | | | | | | |
| | Metatarsal | | | | | | | | | | | | 51.1 | | | | 28.68 | |
| | Metatarsal | L | | | | 31.38 | 30.24 | 50.09 | 36.61 | 43.57 | 10.56 | 7.73 | | | | | | |
| | Metatarsal? | L | | | | | | | | | | | 52.69 | 54.96 | 39.68 | 30.89 | 33.65 | |
| | 1st phalanx | | 84.51 | 77.09 | | 33.52 | 53.96 | 39.81 | 44.05 | 41.72 | 23.21 | 49.29 | 68.43 | 68.9 | 17.13 | 14.37 | | |
| | 1st Phalanx | | 75.34 | 69.83 | | 23.44 | 38.59 | 28.5 | 34.6 | 33.47 | 19.06 | 44.65 | 64.77 | 62.99 | 11.46 | 11.19 | | |
| | 1st Phalanx | | 76.44 | 69.52 | | 23.33 | 38.1 | 28.98 | 34.43 | 33.23 | 20.26 | 43.96 | 64.89 | 64.52 | 10.48 | 11.5 | | |
| | 1st phalanx | | 99.32 | 91.06 | | 35.63 | 60.19 | 40.47 | 51.01 | 47.74 | 28.49 | 55.59 | 83.63 | 85.92 | 15.7 | 14.7 | | |
| | 2nd metapodial | | 37.02 | 28.26 | | 33.41 | 38.64 | 24.94 | 36.81 | | | | | | | | | |
| | 2nd phalanx | | 51.07 | 41.51 | | 51.18 | 58.58 | 33.34 | 55.63 | | | | | | | | | |
| | 2nd phalanx | | 50.39 | 40.86 | | 50.33 | 55.92 ~ | 33.33 | 54.70 ~ | | | | | | | | | |
| AT6 | Humerus | | 292.2 | 272.59 | | 45.25 | | 102.9 | | 87.06 | | | | | | | | |
| | Radius | L | | | | | | 37.8 | 73.94 | | | | | 15.16 | | | | |
| | Ulna | L | | 81.84 | 50.19 | 53.55 | 65.04 | | | | | | | | | | | |
| | Metacarpale | L | | | | | 50.35 | | 41.25 | 15.29 | | 50.69 | 48.15 | 37.05 | 29.48 | | | |
| | Metacarpale | R | | | | | 50.64 | 31.45 | 40.58~ | 15.88~ | 7.26 | | | | | | | |
| | Femur | R | | | | | | | | | | 60.39 | | | | | | |
| | Tibia | R | | | 44.53 | 34.93 | | | | 49.99 | | | | | | | | |
| | Metatarsal | R | 270~ | 262 | 32.18 | 33.28 | 51.78 | | | | 6.27~ | | 48.97 | 37.31 | 28.07 | 30.57 | | |

| EQUID | ELEMENT | SIDE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1st phalanx | R | 85.55 | 77.89 | 34.97 | 53.43 | 39.44 | 45.05 | 44.89 | 23.97 | 48.14 | 70.19 | 70.61 | 14.9 | 14.93 | | | |
| | 1st phalanx | | 79.46 | 73.19 | 32.78 | 52.68 | 34.83 | 45.41 | 43.29 | 24.19 | 46.77 | 66.23 | 67.68 | 13.39 | 12.59 | | | |
| | 2nd phalanx | R | 47.05 | 38.17 | 44.18 | 53.19 | 30.4 | 48.59 | | | | | | | | | | |
| | 3rd phalanx | | | | 67.88 ~ | 48.88 | 28.64 | 33.31 ~ | 10.11 ~ | | | | | | | | | |
| AT7 | Femur | L | | | 48.58 | 59.99 | 123.81 | 87.96 | | | | 68.42 | | | | | | |
| | Tibia | L | 379.4 | | 44.96 | 39.92 | | | 80.81 | 64.93 | 55.33 | | | | | | | |
| | Astragalus | L | | | | | | | 58.35 ~ | | | | | | | | | |
| | Calcaneum | L | 124.6 | 85.33 | 24.89 | 36.08 | 55.58 | | 54.07 ~ | | | | | | | | | |
| | Metatarsal | R | 290.7 | 280.3 | 35.51 | 34.48 | 52.5 | | | | | 54.6 | 53.43 | 40.07 | 28.84 | 32.58 | | |
| | Metatarsal | L | 290.7 | 280.2 | 35.57 | 36.8 | 54.45 | 42.55 | 48.84 | 15.14 | 6.05 | 51.9 | 52.12 | 40.84 | 29.06 | 32.75 | | |
| | 1st phalanx | L | 94.57 | 86.16 | 37.24 | 59.38 | 42.48 | 48.31 | 45.4 | 25.27 | 49.74 | 95.12 | 94.36 | 21.25 | 19.44 | | | |
| AT8 | Astragalus | L | 66.52 | 69.29 | 26.95 | 69.14 | 54.79 | 36.9 | 64.41 | | | | | | | | | |
| | Astragalus | R | 65.88 | 69.15 | 30.08 | 71.3 | 53.89 | 38.86 | 62.16 | | | | | | | | | |
| | Calcaneum | L | 123.6 | | 20.73 | | | | | | | | | | | | | |
| | Calcaneum | R | 123.3 | 87.03 | 20.77 | 35.71 | 60.58 | 57.32 | 68.19 | | | | | | | | | |
| | Metatarsal | R | 294.9 | 285.44 | 35.4 | 36.9 | 54.22 | 45.27 | 45.82 | 15.44 | 7.35 | 52.38 | 55.91 | 43.16 | 30.93 | 35.47 | | |
| | Metatarsal | L | 294.6 | 283.55~ | | | | | | | | 53.61 | 56.98 | 41.7 | 31.28 | 35.24 | | |
| | 1st phalanx | L | 96.7 | 88.2 | 36.94 | 64.41 | 45.28 | 51.91 | 46.44 | 27.47 | 51.75 | 74.85 | 76.25 | 22.25 | 20.8 | | | |
| | 1st phalanx | R | 97.05 | 87.97 | 37.46 | 63.43 | 44.54 | 51.76 | 46.36 | 28.34 | 52.23 | 76.87 | 78.68 | 18.12 | 20.94 | | | |
| | 2nd phalanx | L | 52.18 | 39.35 | 47.47 | 58.75 | 38.56 | 50.57 | | | | | | | | | | |
| AT9 | Radius | R | | | | | | | | | | | | 16.95 | | | | |
| | Metacarpal | L | 258.6 | 247.62 | 36.02 | 28.64 | 55.5 | 36.88 | 45.23 | 15.04 | 7.11 | 55.1 | 54.27 | 40.66 | 30.31 | 34.69 | | |
| | 1st phalanx | R | 99.12 | 87.46 | 35.22 | 61.2 | 43.34 | 48.92 | 46.21 | 28.92 | 56.34 | 79.54 | 79.16 | 16.95 | | | | |
| | 1st phalanx | L | 100.1 | 92.74 | 37.56 | 60.51 | 41.89 | | | 26.46 | 57.32 | 85.46 | | 13.11 | | | | |
| AT? | Metatarsal | - | | | | | | | | | | 55.18 | 53.92 ~ | 40.94 | 30.5 | 34.45 | | |
| | 1st phalanx | - | | | | | 38.32 | | | | | | | | | | | |

Notes: All measurements are after Eisenmann et. al. 1988. The measurments are given in mm.
~ indicates estimated measurements.

# Appendix 7.4. Descriptive morphological characteristics of the occlusal surface

## Upper cheek teeth

| AT1 — L | P2 | P3 | P4 | M1 | M2 | M3 |
|---|---|---|---|---|---|---|
| Shape of Protocone | | | | 7 | 6–7 | 6 |
| Caballine fold | | | | 0 | 0 | 1 |
| AT1 — R | | | | | | |
| Shape of Protocone | | | 7 | 7 | 6–7 | 6 |
| Caballine fold | | | 1 | 0 | 1 | 1 |
| AT2 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Protocone | 2 | 6–7 | 6 | 6 | 6 | 6 |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 0 |
| AT2 — R | | | | | | |
| Shape of Protocone | 2 | 6 | 6 | 6 | 6 | 6 |
| Caballine fold | 1 | 1 | 0 | 2 | 1 | |
| AT4 — L | P2 (503) | P3 (505) | P4 (504) | M1 (484) | M2 (506) | M3 (485) |
| Shape of Protocone | 2 | 7–6 | 6 | 6 | 7–6 | 6 |
| Caballine fold | 1 | 1 | 2 | 0 | 2 | 1 |
| AT4 — R | (482) | (483) | | | | |
| Shape of Protocone | 2 | 7–6 | | | | |
| Caballine fold | 1 | 1 | | | | |
| AT5 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Protocone | 2 | 7–6 | 6 | 7–6 | 6 | 6 |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 0 |
| AT5 — R | | | | | | |
| Shape of Protocone | 1–2 | 7 | 6–7 | 7–6 | 6 | 6 |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| AT6 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Protocone | 2 | 3–7 | 3 | 6 | 6–7 | 6 |
| Caballine fold | 0 | 0 | 0 | 0 | 0 | 1 very small |
| AT6 — R | | | | | | |
| Shape of Protocone | | 3–7 | 3–7 | 3–7 | 6–7 | 6 |
| Caballine fold | | 1? | 0 | 0 | 0 | 1 |
| AT9 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Protocone | 2 | 7 | 7 | 7 | 6–7 | 6 |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| AT9 — R | | | | | | |
| Shape of Protocone | 2 | | 7–6 | 6 | 6 | 6 |
| Caballine fold | 1 | | 1 | 1 | 1 | 1 |

**Lower cheek teeth:**

| AT1 — L | P2 | P3 | P4 | M1 | M2 | M3 |
|---|---|---|---|---|---|---|
| Shape of Lingual fold | U | U | U | U | U–V | U–V |
| Depth of Ectoflexid | Out | Out | Out | Between | Between | Near |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Yes | Yes | Yes |
| AT1 — R | | | | | | |
| Shape of Lingual fold | V | U | U–V | U | U | U–V |
| Depth of Ectoflexid | Out | Out | Out | Between | Between | Near |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Yes | Yes | Yes |
| AT2 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Lingual fold | U | V | V | V | V | U |
| Depth of Ectoflexid | Out | Out | Out | Near | Near | Out |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Yes | Yes | Yes |
| AT2 — R | | | | | | |
| Shape of Lingual fold | U | V | V | V–U | U | U |
| Depth of Ectoflexid | Out | Out | Out | Near | Near | Out |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Yes | Yes | Yes |
| AT4 — L | P2 | P3 (502) | P4 | M1 (479) | M2 (480) | M3 (478) |
| Shape of Lingual fold | | U | | U | V | V |
| Depth of Ectoflexid | | Out | | Between | Between | Near |
| Caballine fold | | 1 | | 1 | 1 | 1 |
| Lingual fold attached | | Yes | | Yes | Almost | Yes |
| AT4 — R | | (500) | (501) | (481) | | (499) |
| Shape of Lingual fold | | U | U | U | | Open V |
| Depth of Ectoflexid | | Out | Near | Between | | Out |
| Caballine fold | | 1 | 1 | 1 | | 1 |
| Lingual fold attached | | Yes | No | Almost | | Yes |
| AT5 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Lingual fold | Open V | U | U | U | V–U | V–U |
| Depth of Ectoflexid | Out | Out | Out | Near | Out | Out |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Almost | Yes | Yes |
| AT5 — R | | | | | | |
| Shape of Lingual fold | Very open | Very U | Open V | U | V–U | U–V |
| Depth of Ectoflexid | Out | Out | Out | Near | Near | Out |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Yes | Almost | Almost | Yes |
| AT6 — L | P2 | P3 | P4 | M1 | M2 | M3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Shape of Lingual fold | | V–U | V–U | U–V | V | V |
| Depth of Ectoflexid | | Out | Out | Between | Between | Between |
| Caballine fold | | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | | Almost | Almost | No | No | Almost |
| AT6 — R | | | | | | |
| Shape of Lingual fold | U | U | V–U | V–U | V–U | V |
| Depth of Ectoflexid | Out | Out | Near | Between | Between | Near |
| Caballine fold | 1 | 1 | 1 | 1 | 1 | 1 |
| Lingual fold attached | Yes | Yes | Almost | No | No | Almost |
| AT9 — L | P2 | P3 | P4 | M1 | M2 | M3 |
| Shape of Lingual fold | | U | U | U | U | U |
| Depth of Ectoflexid | | Out | Near | Between | Between | Inside |
| Caballine fold | | 1 | 1 | 1 | 1 | |
| Lingual fold attached | | Yes | Almost | Yes | Yes | Yes |
| AT9 — R | | | | | | |
| Shape of Lingual fold | U | U | U | U | U | U |
| Depth of Ectoflexid | Out | Out | Near | Between | Between | Inside |
| Caballine fold | 1 | 1 | 1 | | 1 | |
| Lingual fold attached | Yes | Yes | Yes | Yes | Yes | Yes |

CHAPTER 8

# WEAPON INJURIES IN THE 12TH CENTURY CRUSADER GARRISON OF VADUM IACOB CASTLE, GALILEE

*Piers D. Mitchell, Yossi Nagar and Ronnie Ellenblum*[1]

The discovery of the undisturbed site of an historic battle is a rare find in archaeology. The excavations of fallen soldiers at Visby, Aljubarrota and Towton have greatly improved our understanding of battlefield injuries in the medieval period.[2] While it is widely thought that medieval warfare and wounds are well understood, we would argue that we actually know desperately little. The biggest problem is that these three medieval battlefield excavations are the only ones to have ever published a detailed study of the weapon injuries among the casualties. This is profoundly limiting for several reasons. The dates of the battles are all in late medieval period (14th-15th centuries), and so we are ignorant regarding the 10th–13th centuries. Battle tactics, armour design, and weapons all changed tremendously over this period. The geographical locations of the published battles are on the peripheries of Europe (Sweden, Portugal, England), so we cannot rely on them to be representative of areas such as central Europe or the Mediterranean world. Each of the published battles are between European cultures, so we have no archaeological evidence for the wounds sustained when fighting other cultures around the Mediterranean, such as Muslim or Byzantine troops. These medieval superpowers were much larger, more powerful and culturally richer than any country in Europe at that early time. Finally, none of these published studies are of battles involving the siege and sacking of a castle. They were all pitched battles in the open field.

These points highlight how mistaken we may be if we presume that all medieval battle casualties would have followed the pattern noted at Visby.[3] To rectify this, it is important that we undertake archaeological projects that fill in these major gaps in our knowledge. This is not always easy, as often a group of males with wounds may be excavated

---

1 Piers D. Mitchell, Imperial College London, University of London. Yossi Nagar, Israel Antiquities Authority. Ronnie Ellenblum, Hebrew University of Jerusalem. This chapter is based on: Mitchell, P.D., Nagar, Y. and Ellenblum, R. Weapon Injuries in the 12th Century Crusader Garrison of Vadum Iacob Castle, Galilee. *International Journal of Osteoarchaeology* 16 (2006): 145–155.

2 Ingelmark, B. E. The skeletons. In B. Thordman, O. Norlund and B. E. Ingelmark (eds.) *Armour from the Battle of Visby, 1361* (Stockholm, 1939), vol.1,149–209; Cunha, E. and Silva, A. M. War Lesions from the Famous Portuguese Medieval Battle of Aljubarrota. *International Journal of Osteoarchaeology* 7 (1997): 595–599; Fiorato, V., Boylston, A. and Knüsel, C. (eds.) *Blood Red Roses. The Archaeology of a Mass Grave from the Battle of Towton, AD 1461* (Oxford, 2000).

3 Ingelmark, The skeletons, vol.1,149–209.

from a town cemetery but the particular battle, its location, and date remain an educated guess.[4]

Despite this difficulty, the study of town cemeteries, as well as battlefields, can still be useful. Using this approach we can identify those with healed wounds who survived the battle and were buried back in their communities many years later, in contrast to those who sustained fatal injuries on the battlefield itself.[5] A number of excavated medieval sites of this kind in the eastern Mediterranean have demonstrated evidence of trauma and weapon injuries.[6] Although limited in number, these sites do help us place the finds at Vadum Iacob into some kind of perspective. However, it is only when a sufficient number of battlefield excavations have taken place can we say that we are starting to understand medieval war injuries in all their forms.

The skeletal remains from Vadum Iacob castle presented here help us advance one step closer to that goal. The numbers under study are limited, but for a whole host of reasons the findings are highly illuminating. This is an excavation of a battle during the Crusades, taking place at a castle, dated to the twelfth century, where Europeans fought Muslim troops. All these facts make this case extremely unusual. Unlike so many other castles, the area was largely undisturbed since the siege, as it was never used as a fortification since it was destroyed in 1179. This is rare, as castles were often cleaned up, renovated, and then defended by the victor after a siege. This means that not only are the bodies of the garrison still in situ, but so are other items from the battle such as the weapons. We also have at our disposal detailed written records from the twelfth century which give many details that excavation alone could never tell us. For all these reasons, Vadum Iacob castle has been a particularly illuminating excavation.

As has been related in the previous chapters, a garrison of eighty Templar knights, foot soldiers and many craftsmen resided at the site when the fortress was besieged by Saladin on Saturday 24 August 1179. Saladin apparently executed the Frankish archers responsible for many of his casualties. The rest were taken captive and sold into slavery. Sources claim that Saladin took the armour of about 1,000 knights and footmen and large numbers of weapons as booty. The Muslim soldiers then destroyed the castle, throwing some of the corpses of the defenders into a deep cistern, and others into the burning buildings.[7] This cistern has never been found, despite a thorough search by the excavation

4 Stroud, G. and Kemp, R. L. *Cemeteries of the Church and Priory of St. Andrew, Fishergate* (York, 1993).

5 Boylston, A. Evidence for Weapon-Related Trauma in British Archaeological Samples. In M. Cox and S. Mays (eds.) *Human Osteology in Archaeology and Forensic Science* (London, Greenwich Medical Media, 2000), 357–380; Weber, J. and Czarnetzki, A. Neurotraumatological Aspects of Head Injuries Resulting from Sharp and Blunt Force in the Early Medieval Period of Southwestern Germany. *American Journal of Physical Anthropology* 114 (2001): 352–356.

6 Barnes, E. The Dead Do Tell Tales. In C. K. Williams and N. Bookidis (eds.) *Corinth: The Centenary, 1896–1996* (Princeton, American School of Classical Studies at Athens, 2003), 435–443; Mitchell, P. D. The Integration of the Palaeopathology and Medical History of the Crusades. *International Journal of Osteoarchaeology* 9/5 (1999): 333–343; Mitchell, P. D. The Palaeopathology of Skulls Recovered from a Medieval Cave Cemetery at Safed, Israel (thirteenth to seventeenth century). *Levant* 36 (2004a): 243–250; Smith, P. and Zegerson, T. Morbidity and Mortality of post-Byzantine Populations from Caesarea. In K. G. Holum, A. Raban and J. Patrich (eds.) *Caesarea Papers* 2: *Herod's Temple, the Provincial Governor's Praetorium and Granaries, the Later Harbor, a Gold Coin Hoard and Other Studies*. Journal of Roman Archaeology Supplementary Series 35 (Portsmouth, 1999), 433–440.

7 Barber, M. Frontier Warfare in the Latin Kingdom of Jerusalem: The Campaign of Jacob's Ford, 1178–79. In J. France and W. G. Zajac (eds.) *The Crusades and their Sources: Essays Presented to Bernard Hamilton* (Aldershot, 1989), 9–22; Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–97.

team. However, the skeletal remains of a number of individuals have been found within a layer of ash beneath a collapsed building. It is these individuals that are the subject of this study.

## Description of the pathology

The skeletal remains of five adult males (Fig. 8.1) were excavated from Vadum Iacob castle by the second author (Y.N.). Standard criteria were employed to determine sex and age at death from the skeletal material. Their estimated ages ranged between 20 and 40 years. All were recovered in a Frankish context. These individuals were found in a layer of ash under the collapsed vaults of the only building that had been completed by the time the castle was destroyed. None were formally buried. The bodies lay in an apparently random orientation and with remaining limbs randomly positioned.

Large numbers of arrowheads have been recovered during the course of the excavation (Fig. 8.2). They are typically 4.5–6.5 cm long, square or triangular in cross section, narrow and pointed in shape. These are located throughout the site, both inside and outside the castle walls. The first individual, aged 30–40 years (L203s), was found with an arrowhead embedded within the anterior aspect of the left iliac bone. A second skeleton, aged 20–30 years (L212), was found with a similar arrowhead intimately associated with the outer aspect of the left humerus, but not buried within the bone. A third man, aged 30–40 years (L929), was recovered with three arrowheads intimately associated with the cervical vertebrae (Fig. 8.3).

The skeletal remains of two individuals (L203 and L929) also had multiple abnormalities of man-made appearance. They were typically straight, with smooth shiny margins and sharp edges. One was partial thickness, but the others were full thickness through the involved bone. There was no evidence of periosteal reaction or bone remodeling around any lesion. The appearance of the lesions was most compatible with a diagnosis of weapon injuries from sharp, thin blades such as a sword. The positions of these lesions are detailed below.

An adult male, aged 30–40 years (L929), sustained one wound on the left distal humerus at the level of the elbow joint. An oblique lesion ran superolaterally to inferomedially and completely divided the bone in two (Figs. 8.4–8.5). The forearm was missing, suggesting that amputation occurred before he reached the building. Another wound was present in the left side of the mandible, which divided it in two (Fig. 8.6). A nearby wound was noted on the adjacent maxilla. The prominence of the maxilla was missing on account of this wound, suggesting a sideways blow to the cheek. A further wound was located at the front of the skull (Fig. 8.7). It was full thickness, oriented in the sagittal plane and divided the surviving cranium into two.

The second individual, aged 25–30 years (L203n), had only one wound, in the humerus of the left shoulder (Fig. 8.8). This was a deep, straight, longitudinal lesion in the head and proximal shaft of the bone, lying in the sagittal plane. It extended into the shoulder joint but did not transect the bone as occurred in L929. As the bone largely remained intact except for this wound, it was possible to measure its diameter (2 mm) along its entire length.

The final soldier, aged 25–30 years (L930) had no visible wounds, and it is thus presumed that he died from soft tissue injuries (Fig. 8.9).

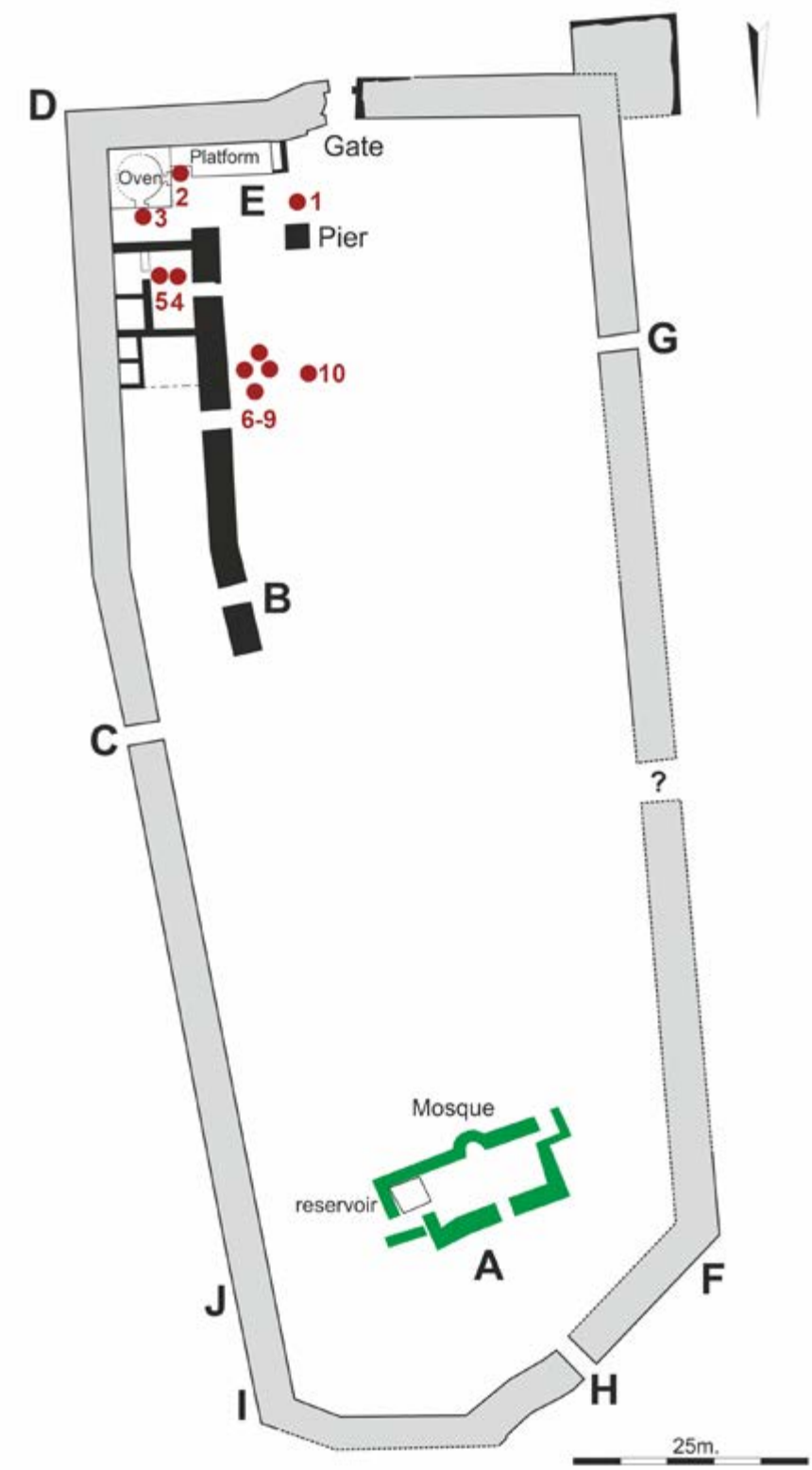



**Figure 8.1.** Fortress plan with the location of Frankish skeletons (plan renewed by Jay Rosenberg).

**Figure 8.2.** Iron arrowheads from the excavation (photo by Bouky Boaz).

**Figure 8.3.** The third man with three arrowheads intimately associated with the cervical vertebrae Area E, L929 (Photo by Eran Aleph).

**Figure 8.4.** Sword injury to left elbow, with transection of the distal humerus. View of posterior aspect of elbow. Area E, L929. (Photo by Piers D. Mitchell, reproduced with permission of Cambridge University Press).

**Figure 8.5.** Sword injury to the left shoulder, with partial thickness wound to the humeral head. (L203n). Anterosuperior view. Part of the metaphysis has been lost post mortem. (Photo by Piers D. Mitchell, reproduced with permission of Cambridge University Press).

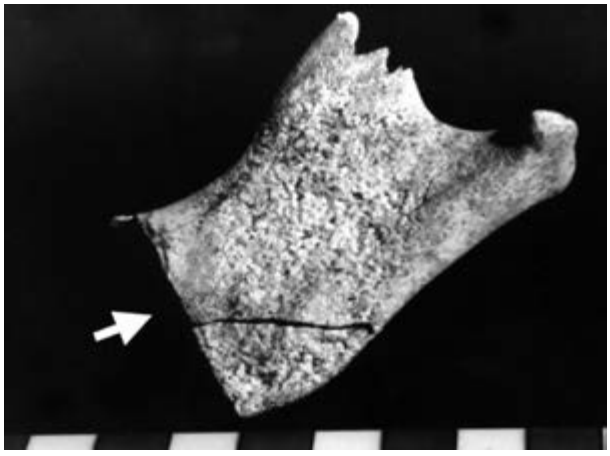


**Figure 8.6.**Sword injury to the left side of the mandible (L929)
(Photo by Piers Mitchell reproduce with permission of Cambridge University Press).

**Figure 8.7.** Sword injury to the frontal bone of the skull (L929)
(Photo by Piers Mitchell reproduce with permission of Cambridge University Press).

**Figure 8.8.** Sword injury to the left shoulder (L203) (Photo by Piers Mitchell reproduce with permission of Cambridge University Press).

**Figure 8.9.** Soldier aged 25-30 years (Area E, L.930) No wounds were visible and it is presumed that he died from soft tissue injuries.

## Differential diagnosis

The well-defined nature of these findings mean that a conventional, wide-ranging differential diagnosis is unnecessary. However, it is sensible to consider the various options that might explain the findings, to ensure our interpretation is reasonable. There are two different types of abnormality described in these remains, the arrowheads and the sharp-edged bony lesions suggestive of blade injuries.

Although many of the arrowheads are badly corroded, a number are relatively well preserved (Fig. 8.2). The arrowheads are designed to penetrate chain mail in a battlefield setting.[8] The next point to consider is whether finding arrowheads next to bone can safely be interpreted as showing the arrow was actually in the soft tissues at the time of death. If the arrow lay on the ground and the soldier fell on top

8 Raphael, K. Crusader Arms and Armour. In S. Rozenberg (ed.) *Knights of the Holy Land*: *the Crusader Kingdom of Jerusalem* (Jerusalem: The Israel Museum, 1999), 149–159.

of it as he died from a different wound, the arrowhead may be misinterpreted as originally being in the soft tissues. Clearly, if the arrow was embedded in the bone, as occurred in one case here, then we can be sure the association confirms an arrow wound. If the arrowhead lay on top of the bones, then we know the soldier did not fall onto the arrow. If the soldier lay on top of the arrowhead but the tip of the arrow pointed downwards into the soil, this would suggest the arrow had landed in the ground during the battle. If the tip pointed upwards towards the soldier, then this would be more compatible with an arrow wound. However, due to the potential for movement of the arrowheads during the decomposition process, there will never be one hundred percent certainty that such arrows were within the soft tissues at death, if they are found underneath the skeletal remains during excavation.

The other abnormalities under discussion were straight, sharp-edged lesions of the bone with smooth, polished sides. One was measured to be 2 mm wide along its entire length. These certainly had the appearance of human-instigated alterations; no organic, *in vivo* pathology causes such straight edges. An excavation using poor techniques can lead to damage to skeletal remains with straight edges, if trowels or similar implements gouge into the bones. However, the appearances of such pseudopathology are very different to those seen here. Trowel damage during excavation tends to leave crumbling, rounded edges as no protein remains in the bone to give it strength. For sharp edges and smoothly polished surfaces the changes must be made around the time of death, before the protein is lost. Furthermore, the lesions were of the same colour as the bone elsewhere, and not pale as occurs in excavation damage. Therefore, these lesions are not compatible with peri-excavation trauma. They certainly have the appearance of perimortem sharp-force weapon injuries.

## Discussion

In just these five wounded soldiers we have a range of weapon injuries that are highly informative of twelfth century siege warfare. We are now in a position to discuss the characteristics of the soldiers, the severity of their wounds, the role of different weapons in different stages of the battle, the relationship between Frankish armour and wounds from Muslim weapons, and treatment of the bodies by the victors after the battle. We can also integrate this archaeological information with written descriptions of medieval battles and wounds.[9]

### The soldiers in the garrison

Written records tell us that the garrison at Vadum Iacob castle was comprised of knights and foot soldiers from the Order of the Temple, archers and the army of the King of Jerusalem, together with the craftsmen who were building the castle. We will never know exactly who the five individuals found in the destruction debris were. They may have been high ranking officers separated out for execution.

9 Mitchell, P. D. *Medicine in the Crusades: Warfare, Wounds and the Medieval Surgeon* (Cambridge, 2004b).

However, they may just have been foot soldiers killed at that spot, which was then engulfed by the burning building. Since the majority of soldiers in the army of the King of Jerusalem were craftsmen and farmers called up to fight in times of need, there would have been little or no distinction between professional and non-professional soldiers during such a battle. The ages of these men are interesting. All five were between 20 and 40 years old. Despite the known shortage of military personnel in the Frankish states in the Latin East during the time this castle was built,[10] there is no evidence here for child soldiers or conscription of the elderly to bolster numbers in the army.

## Battle wounds or execution?

The written sources mention that some of those captured when the castle fell were executed.[11] It is important to consider whether the dead under examination here died from battle wounds, or execution wounds. Executions in this context would have involved weapons in hand, rather than constructing other methods of execution, such as gallows. Records describe how some twelfth century Muslim rulers executed their Crusader captives.[12] In 1119 the troops of Il-Ghazi of Aleppo used their Frankish captives for arrow and lance practice.[13] However, at Vadum Iacob there was no evidence for such injuries to the chest or upper abdomen, where we might expect to find them. In 1191 Saladin beheaded a number of his Frankish captives.[14] However, there was no evidence for blade injuries to the cervical spine in these Vadum Iacob individuals. While we cannot be completely certain, it seems more likely that the five excavated individuals described here died from battle wounds, rather than execution after the garrison surrendered.

## Fatal and non-fatal wounds

The next point to consider is the nature of the wounds sustained. One soldier had the front of his skull cleaved in two, with a blow deep into the brain. He also had his left arm amputated through the elbow. Both of these wounds would have been fatal, due to brain damage and blood loss, respectively. He also sustained non-fatal blade wounds to the left side of his face, completely dividing his mandible in two and slicing off part of the maxilla. This same man sustained three arrow wounds to his neck. In theory he may have bled to death from such wounds, if major blood vessels were punctured, or he may have asphyxiated if the airway was damaged. However, the severity of his blade wounds suggests that he probably did not die from the arrows, but from the sword wounds he sustained in close quarter fighting. The man found with the arrow in his pelvis might, in theory, have died from that wound too. Based on the orientation of the arrowhead at excavation, the arrow should have entered the abdomen from the soldier's right side and

10 Hamilton, B. *The Leper King and his Heirs*: *Baldwin IV and the Crusader Kingdom of Jerusalem* (Cambridge, 2000), 54–55.
11 See Chapter 5.
12 Mitchell, P. D. The Torture of Military Captives During the Crusades to the Medieval Middle East. In N. Christie and M. Yazigi (eds.) *Noble Ideals and Bloody Realities*: *Warfare in the Middle Ages, 1378–1492* (Leiden and Boston, 2006), 97–118.
13 Walter the Chancellor. *The Antiochene Wars.* Ed. H. Hagenmeyer. Trans. T. S. Asbridge and S. B. Edgington (Aldershot, 1999), 163.
14 Ibn Shaddad, *The Rare and Excellent History of Saladin*. Editor & translator D. S. Richards (Aldershot, 2001), 168–177.

passed through the soft tissues to become lodged in the left side of the pelvis. If it transected the large blood vessels that run close to this area he could have quickly bled to death. The evidence for wounds in the other soldiers is vivid, but while the injuries must have been painful and debilitating, they were not life-threatening. A partial thickness sword blow to the shoulder, or an arrow embedded in the outer aspect of the upper arm, could not have damaged the major blood vessels. It seems that these members of the garrison probably died from other soft tissue injuries, of which no evidence remains today.

## Common wounds in the battle

It is helpful to know which were the most common wounds and infer from this which weapons were most useful in battle. Muslim texts on warfare and art depicting soldiers show a range of weapons used by Muslim troops.[15] We know such soldiers used the sword, dagger, axe, mace, and projectile weapons, such as the bow, crossbow and javelin. The cavalry also used the lance and spear. From the deaths of these Frankish soldiers, it is clear that the wounds were largely due to arrows and blade injuries. It is more than likely that with a larger sample we would find depressed skull fractures from mace blows or stab wounds from daggers, but they were not visible on the material available for study. Lance thrusts might not be common in those defending a castle, as the lance was most effective in the open field where a horseman was free to maneuver. Any horsemen who broke into the castle compound may have used their close-quarter weapons instead, such as their swords.

It is hard to know exactly when the dead Frankish soldiers sustained their arrow wounds. Projectile weapons such as arrows and trebuchet stones were the easiest way for the besiegers to attack the garrison until such time as the walls had been breached, and so the arrow wounds may have been sustained during the siege. However, medieval written sources describing battles often mention how such arrows were pulled out during the battle. The wounded man performed this himself, or it was performed by his companions or a nearby medical practitioner on the battlefield.[16] Consequently, the finding of these arrows still within the bodies suggests an alternative explanation. It seems most likely that these wounds occurred shortly before death, and that the soldiers did not live long enough to remove the arrows. It may be that they died shortly after being shot with no opportunity to remove the arrows, or that they sustained the wounds during the sack of the castle when it was every man for himself.

## Defensive body armour

It is interesting to look at the distribution of wounds on the bodies, bearing in mind the configuration of the defensive armour usually worn by Crusader and Frankish soldiers in the twelfth century. Typical twelfth century Frankish chain mail (the hauberk) covered the head, chest, abdomen, thighs and

15 Nicolle, D. *Arms and Armour in the Crusading Era,1050–1350* (New York, 1988), vol.1, 318–335 and vol. 2, 804–811; Nicolle, D. The Reality of Mamluk Warfare: Weapons, Armour and Tactics. *Al-Masaq* 7/1 (1994): 77–110.

16 Mitchell, Medicine in the Crusades.

shoulders. The face was left exposed, and the mail stopped just above the elbow and the knee.[17] Under this was often worn a padded lining which helped to dissipate blows from the mace and impede the penetration of any arrows. By the 1170s the helmets worn by knights were mostly rounded over the skull with some facial protection, but a few may have worn the newly developed great helm which gave much more facial protection. By the end of the twelfth century the kettle hat became popular among foot soldiers. This was rounded over the skull and had a wide brim, which gave reasonable protection without impeding vision, but did little to protect the face.[18] It seems that there was enough chain mail within the castle to protect most, but perhaps not all, of the men in the castle. This must be kept in mind when interpreting the remains, but we have only a limited idea today as to what each excavated individual might have been wearing at his death.

Two of the five skeletons had sustained deep sword blows to the bones. If we concentrate on the blows to the limbs, we can see that one was a deep cut, while the other completely amputated the arm. It is possible that the former blow was just not struck as hard as the latter, but another explanation may be the presence of chain mail. The blow to the shoulder would have been significantly impeded by the mail and underpadding that would typically protect that area. However, the site of the wound to the elbow was just below the level where mail usually stopped, and the elbow would have been largely unprotected. In consequence, the contrast in wound depth may be demonstrating the effectiveness of medieval chain mail. While it could not always prevent injury from a heavy blow with a sharp sword, it could slow the blade sufficiently to convert a fatal wound such as limb amputation to a less severe wound where survival was more likely.

Chain mail would have given little protection from blows to the face and forehead, as the hauberk did not cover this area. The helmet may have given protection, depending upon the type worn. Only the great helm gave much facial protection, but we do not actually know if they were used in the castle, as they were a recent invention at that time. Other helmets gave little facial protection and would not have prevented the wounds to the mandible and maxilla noted in one garrison soldier. The blade injury to the forehead that entered deep into the brain may just have been from an immensely powerful attacker or may have followed the loss of the helmet in battle.

Another point we need to consider is what the distribution of the sword wounds actually signifies. Four of the five wounds were in areas of the body that were not protected by the hauberk. One possibility is that blows with the sword landed all over the soldiers' bodies, but that hardly any penetrated the chain mail. However, another possibility is that the attackers were actively targeting those areas of the body that were not protected by the hauberk. This would explain the distribution of the wounds, and also suggest the expenditure of less energy with each effective blow and a reduction in the blunting of swords against armour.

If we accept that the soldiers were wearing chain mail, then the presence of arrows in soft tissues at the time of death is important. It seems that whatever degree of protection the mail and underpadding gave the soldier, at least some of

17 Edge, D. and Paddock, J. M. *Arms and Armor of the Medieval Knight* (London, 1996).
18 Edge and Paddock, *Arms and Armor*.

the arrows were able to penetrate these layers. This agrees with evidence from written sources.[19] Clearly medieval soldiers would not have bothered to wear armour if it did not help protect them to some extent. However, even the best armour could be penetrated by the right kind of arrowhead.

## Comparison with other battles

Having thoroughly analyzed the location, number and type of wounds sustained by these men it seems sensible to compare the findings with the results gleaned from the few published medieval battlefield excavations. All the five sword wounds were inflicted on the soldiers' fronts. This is most compatible with hand-to-hand fighting while facing an opponent. All sword wounds were on the left side of the body, which is where a right-handed attacker would naturally have landed his strongest blows. Almost all were full thickness wounds, right through the bone. These findings are in contrast to the pattern seen at Visby, Towton and Corinth, where wounds were present on all sides of the skull (albeit more common on the left at Visby) and a large proportion of them were partial thickness.[20] It seems that those garrison soldiers who sustained sword wounds were not in disarray or trying to flee, but were standing their ground in an attempt to defend themselves. This may represent good military discipline among the troops, or may merely reflect that in a besieged castle with enemy soldiers pouring through a breach in the walls, there is nowhere to run.

## Conclusions

Analysis of the garrison men who died in the siege of this medieval castle has been surprisingly illuminating. Although only a limited number of soldiers have been recovered, it is the nature of the site that allows us to recreate their last hours so vividly. The exact date of the siege, and the two armies that clashed, make this site unique. The abundant historical records and intact archaeological contexts also contribute greatly to analysis and interpretation.

Despite the known shortage of Frankish soldiers at the time, no evidence was recovered for the conscription of children or the elderly in the garrison. The findings testify that arrows and swords were responsible for many of the wounds inflicted during the battle of Vadum Iacov. The weapons used were not of the full range seen at open battlefield sites, which may reflect the nature of this battle: that of a siege. Variation in the depth of some sword wounds fits in well with our knowledge of medieval defensive armour. The distribution of sword blows can be explained either by chain mail being highly effective in stopping a sword, or by the deliberate targeting of unprotected areas of the body by the attacker. Archaeological excavation cannot provide information about soft tissue injuries sustained in the battle; which can only be gleaned from historical records. The bony injuries do indicate, however, that the fighting was brutal, and must have been harrowing for those who died that summer's day in 1179.

19 Mitchell, *Medicine in the Crusades*.
20 Ingelmark, The skeletons, vol. 1, 149–209; Fiorato et al. *Blood Red Roses*; Barnes, The Dead.

CHAPTER 9

# WITH THE MONEY, YET WITHOUT THE HEAD! SKELETAL REMAINS FROM THE CRUSADER FORTRESS AT JACOB'S FORD

*Yossi Nagar*

Four human skeletons were found at the central entrance to the long, vaulted gallery (Figs. 9.1–9.2), below a pile of large stones that fell from the gallery's wall (Wall 30, Area E, L115, B1021). The bones were found in a layer of ash among burnt pig bones. The four men no doubt found their death during the battle that took place after Saladin's


**Figure 9.1.** The red circle marks the location of the four human skeletons (photo by Itai Hinch, SAR Unit Mevo'ot Hahermon).

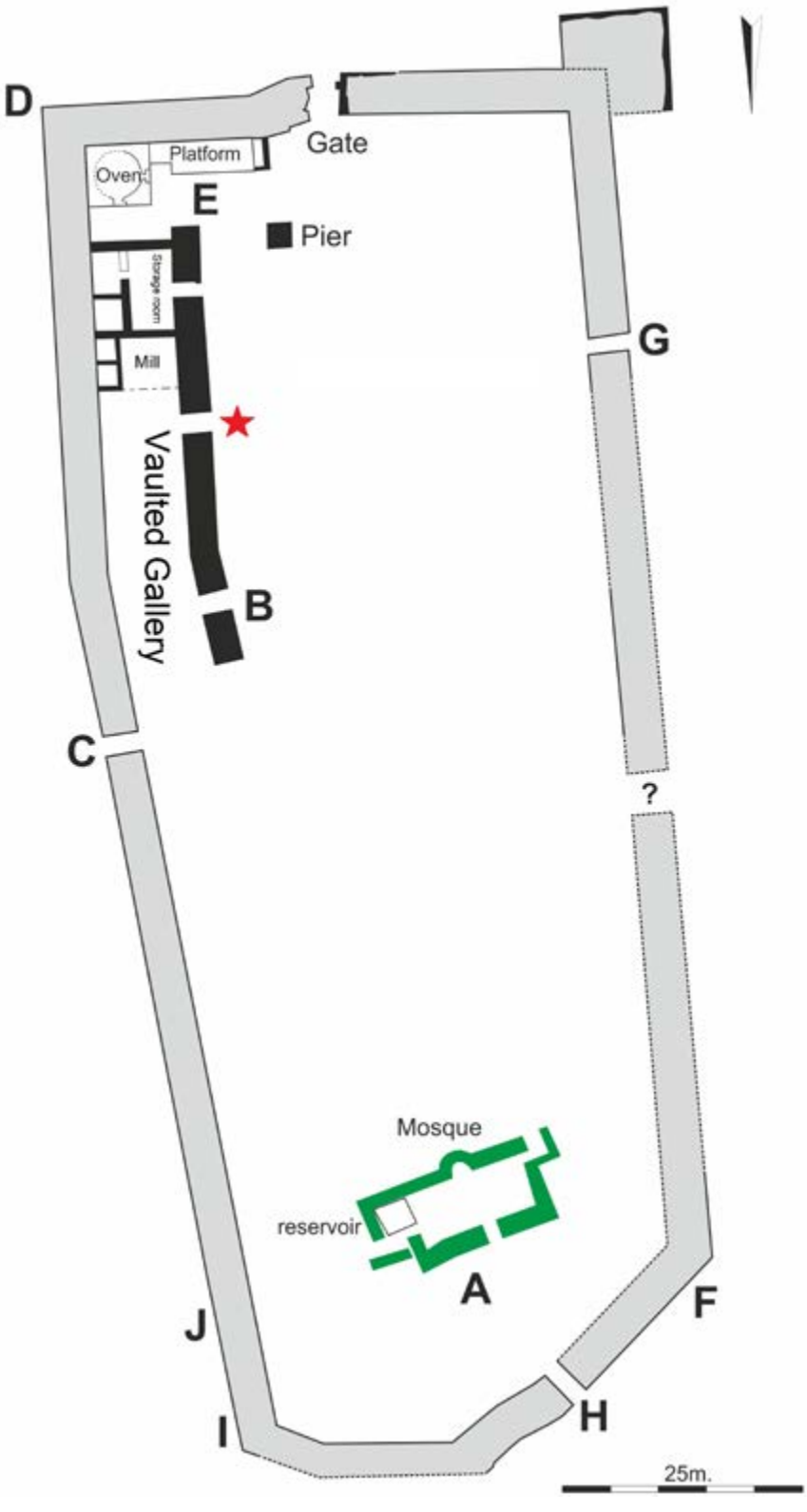



**Figure 9.2.** Plan of the fortress. The red star marks the location of the skeletons.

**Figure 9.3.** Three of the skeletons in L115 next to the large grinding stone, below and between the collapsed stones.

forces breached the wall and entered the fortress grounds.[1]

Although the remains were in a poor state of preservation, they were inspected on site and some basic anthropological data was retrieved. The bones were anatomically articulated, indicating their current position as the original one (Fig. 9.3).

**Skeleton H1**

The remains included fragmentary skull and post-cranial bones. However, the lower limbs, apart from the left femoral head, had disintegrated. The skeleton was found on its back, in the east/west direction, with the head to the east. The skull manifested male characteristics: the glabella and mastoid process were relatively developed. The vertical diameter of the proximal head of the left femur measured 47 mm, indicative of a male.[2] The epiphyses of the long bones were all fused, and the ring epiphyses of the vertebrae were fused, indicative of an adult, over 20 years old.[3] No osteophytes were noticed. In the lower jaw, a canine showed small dentine cup, the first and second premolars showed small dentine cup in one cusp, a first molar showed dentine cup in three cusps, a second molar showed dentine exposure in one of the cusps, while a third molar had erupted, showing enamel attrition only (Fig. 9.4). In the upper jaw, a first premolar showed dentine exposure in both cusps, a first molar showed dentine cup in one of the cusps. Age at death, based on tooth attrition stages, was estimated as 25–40 years.[4]

1 For a more detailed account of the archaeological and historical context see Raphael, this volume, Chapter 5.

2 Bass, W. M. *Human Osteology. A Laboratory and Field manual.* 5th Edition (Columbia: Missouri Archaeological Society, 2005), 230.

3 Johnston, F.E. and Zimmer, L. O. Assessment of Growth and Age in the Immature Skeleton. In M. Y. Iscan and K.A.R. Kennedy (eds.) *Reconstruction of Life from the Skeleton* (New York, 1989), 11–22.

4 Hillson, S. *Teeth* (Cambridge, 1986), 176–201.

**Figure 9.4.** Skull of skeleton H1.

**Figure 9.5.** The coin hoard next to the arm (humerus) of Skeleton H2, indicated by a red circle.

**Skeleton H2**

The remains included fragmentary postcranial bones. The head was absent. The axial part of the skeleton, apart from a piece of a cervical vertebra, clavicles, and a small fragment of a rib, was totally disintegrated. The deceased was found on his front, oriented east/west, with the head (absent) to the east.

The vertical diameter of the proximal head of the femur was measured 50 mm (right) and 51 mm (left), indicative of a male. The epiphyses of the long bones were all fused, and the ring epiphysis of the cervical vertebra was fused, indicative of an adult, over 20 years old. The bones were visually examined for the presence of pathologies. No pathologies were noticed. The Crusader coin hoard was found in a pouch next to the joint of the right elbow of Skeleton H2 (Fig. 9.5).[5]

**Skeleton H3**

The remains included fragmentary postcranial bones. The head was absent. The deceased was placed on its front, in the east/west direction, with the head (absent) to the east. The vertical diameter of the proximal head of the right femur was measured as 44 mm, non-indicative of its sex.[6] The epiphyses of the long bones were all fused, and the ring epiphyses of the vertebrae were fused, indicative of an adult, over 20 years old.[7] No osteophytes were noticed. The bones were visually examined for the presence of pathologies. No pathologies were noticed.

**Skeleton H4**

The remains included a few skull-vault fragments, four teeth, the right scapula, and a humeral head. The rest of the skeleton was not excavated. The deceased was found on its back, in the east/west direction, with the head to the east. The proximal epiphysis of the humerus was fused, indicative of an adult, over 19 years old.[8] Its diameter could not be measured. Scattered teeth: two lower canines (right and left) showed small dentine cup, a lower premolar showed dentine cup in one cusp, the upper left third molar erupted, showed enamel attrition. Age at death, based on tooth attrition stages, was estimated as 25–40 years.[9]

## Discussion and conclusions

The human skeletal remains from Locus 115 in Area E consist of four adult individuals. The bones were found in anatomical articulation, suggesting the original postures of the dead. All four individuals were oriented in an east-west direction, with the heads to the east. However, their unusual positioning might suggest that their bodies were thrown from the west side to the east, and covered by large stones that collapsed when the building was destroyed by the Muslim force, rather than deliberately buried in a specific posture. The two missing heads suggest that these individuals were decapitated before their bodies were thrown. These two persons were found lying on their front, which is unusual. The age and sex of the skeletons is presented in Table 9.1. Two were identified as males, all were >20 years old.

5 For a detailed analysis of the coin hoard, see Chapter 17.
6 Bass, *Human Osteology*, 230.
7 Johnston and Zimmer, Assessment of Growth.
8 Johnston and Zimmer, Assessment of Growth.
9 Hillson, *Teeth*, 176–201.

**Table 9.1.** Summary of the anthropological data, Locus 115.

| INDIVIDUAL | BODY POSTURE | ESTIMATED AGE | SEX | REMARKS |
|---|---|---|---|---|
| H1 | on its back, in the east/west direction, head in the east | 25–40 years | Male | |
| H2 | on its front, in the east/west direction, head in the east | 20< years | Male | Decapitated |
| H3 | on its front, in the east/west direction, head in the east | 20< years | ? | Decapitated |
| H4 | on its back, in the east/west direction, head in the east | 25–40 years | ? | |

According to Professor Ellenblum, Saladin took his own men who died during the battle with him and gave them a proper burial. Therefore, the skeletons found at the site were of individuals that belonged to the garrison and/or the worker contingent. According to ʿImād al-Dīn, Saladin ordered the execution of the archers. The term used in Arabic ضرب عنقه. ḍaraba ʿunuqahu, literally means "the head was cut off."[10]

وقد حمدالله سبحانه وحده فمن احضر من الاسارى
عنده استنطقه فان كان مرتدا او رميا يخرج ضرب عنقه

"Praise be to Allah, Glory be to Him alone, the prisoners who were brought [to the sultan] were question by him, and if [the prisoner] was a renegade or an archer, he was beheaded."[11]

It thus seems possible that the above skeletons without the skulls were among the archers employed by the Templar garrison, who were executed by Saladin. Finding a pouch with coins next to one of the skeletons suggests they were killed and thrown down, with their clothes on. No one bothered to search the bodies for any personal valuable items. Perhaps the heat of the August days, the stench of the putrefying corpses, and the outbreak of disease among the Muslim force,[12] left no time for a thorough examination of the dead enemy.

In a previous excavation, five more skeletons, identified as adult males, were found at this site.[13] These individuals, regarded as Crusader soldiers by the excavators, manifested cut marks due to weapon injuries, and were also randomly thrown down, rather than conventionally buried. No doubt both finds represent victims of the same traumatic event.

10 Ayalon, D. and Shinar, P. *Arabic-Hebrew Dictionary of Modern Arabic* (Jerusalem, 1991), 206.

11 ʿImād al-Dīn al-Isfahani, *Sana al-Barqu al-shami*, 170. This passage is also quoted in Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl, *Kitāb al-rawḍatayn*, *fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3, 37. Renegade (*murtadd*), i.e., one who converted to Christianity or a Muslim who fought on the Templars' side.

12 ʿImād al-Dīn, *Sana al-Barqu*, 171.

13 Mitchell, P.D., Nagar, Y. and Ellenblum, R. Weapon Injuries in the 12th Century Crusader Garrison of Vadum Iacob Castle, Galilee. *International Journal of Osteoarchaeology* 16 (2006):145–155; and see this volume, Chapter 8.

CHAPTER 10

# THE FAUNAL REMAINS FROM THE TEMPLAR FORTRESS AND THE MAMLUK HAMLET

*Ron Kehati*

This chapter focuses on the fauna found in the Frankish level that dates to the eleven months during which the fortress was built and its destruction phase at the end of this period (October 1178–August 1179). Part of this chapter also examines the fauna of the Ayyubid and Mamluk hamlet that developed above the fortress ruins. The equid bones were researched by Hadas Motro and are reported in Chapter 7.

According to Muslim sources, c. 1500 men occupied the site when the fortress was conquered. This large number included Templar knights, archers foot soldiers, craftsmen, and Muslim prisoners who were incorporated into the work force.[1] Large quantities of nourishing, high-caloric food were needed for the fighting forces and workers. While the food had to be readily available, the foodstuffs also had to be of a type that could be preserved and stored for long periods of time, in the event of a prolonged siege. According to Abū Shāma: "The fortress was stocked with food for several years, good and abominable[2] types of meat and various goods that could keep for long periods of time."[3]

The excavations exposed layers of siege and destruction in which a large number of bones were recovered. Partial and complete skeletons as well as single bones, of both humans and animals, were found throughout the site.

While some bones were only singed, many bones were found to be burnt. In contrast to most sites, where animal bones represent the leftovers of meals and food remains, the assemblage of animal bones at the Crusader fortress of Jacob's Ford is unique in that many of the bones belonged to animals killed during the siege and the fighting.

## The Finds

The bones in this study are from clear, well-documented contexts from the two levels of occupation: the fortress and the hamlet. A total of 3359 bones were examined and catalogued in a data base. Most

1 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusade* 2 (2003), 83–98; Ellenblum, R. Crusader Castles and Modern Histories (Cambridge, 2007), 258–274.

2 Probably referring to pork.

3 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl, *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* vol. 3 (Beirut, 1997), 44.

of the bones were handpicked; in a number of important loci the bones came from fills that were sifted. A number of skeletons were found in articulation. Some bones were single finds and some were gathered in various cooking installations.

Tables 10.1 and 10.2 present the numerical data from each occupation phase, by excavation area and species.[4] The animals in the fortress were domesticated farm animals common in both the region and the period. Wild animals are barely represented. It is, however, important to note that differentiation of wild boars from domesticated pigs is often difficult (see further discussion below).

A further examination of Table 10.1 shows that most of the bones (80.5%) in the Crusader level came from Area E (Fig. 10.1).[5] Considerably smaller quantities came from Areas A (8.3%), C (8.3%) and G (2.9%).

## Sheep and Goat (*Ovis/Capra*)

Wild goats and sheep no longer existed in the region in the Crusader period. Domestic goats and sheep, on the other hand, had been part of the traditional homestead for thousands of years, kept for their meat and milk, their skin, hair, and wool. The Crusader level yielded 225 bones identified as 'goat', 'sheep' or *Ovis/Capra* (when it was not possible to provide an exact identification) — 8.1% of the total assemblage.

The vast majority of these bones (n=175) was found in Area E, and the rest mainly in Area C (n=38) and Area G (n=10). One bone was identified with certainty as belonging to a male sheep, according to its cranial horn core. The field excavation reports, as well as the assemblages examined, show that none of the sheep remains were found in articulation. Of the bones found in Area E, 25% (n=43) are from the large oven. Of these, 33 have burn marks while 10 have none. Of the remainder of the bones in Area E, only six bear light or medium burn marks.

The sheep remains included all parts of the body. There was no noticeable difference or preference in the consumption and use of parts (see Table 10.3). In Area E, the sheep bones excavated from the oven also represent all parts of the animal, including the skull and teeth and the ends of limbs — usually defined as waste and rarely chosen for cooking and grilling. It is possible that these animals were placed in the oven whole and served intact. This may explain why the entire skeleton was found in the oven (Fig. 10.2). Only three bones exhibited cutting marks: two scapulae with cutting marks at the proximal end of the joint and one tibia with crude chopping marks at the center of the bone shaft.

Table 10.4 shows that only 20% of the young sheep and goats were used for meat. Most of the animals were raised until they were 2–4 years old; this suggests that the herd was managed and reared for the multiple purposes of meat, milk and wool. From among nine sheep lower jaw bones, four had milk teeth and belonged to animals of about a year

4 When comparing the data from Jacob's Ford to other sites it must be remembered that the equid bones were not incorporated into this study.

5 Area E, in the southeast corner of the fortress, was the largest area excavated; it is not surprising that the largest number of bones was found there.

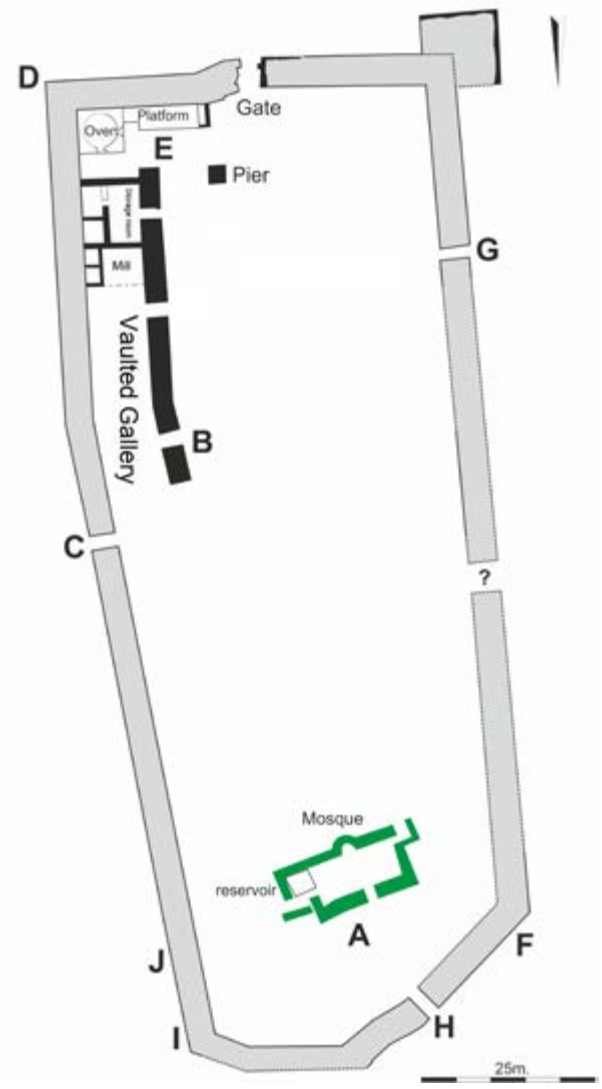



**Figure 10.1.** Plan of the Templar fortress with the excavation areas marked in capital letters (plan renewed by Jay Rosenberg).

**Figure 10.2.** The large Crusader oven in the southeast corner of the fortress (Area E).

**Figure 10.3.** A Mamluk period tabun on the ruins of the main gate (Area E, L858).

**Figure 10.4.** A Mamluk tabun on the ruins of the western postern (Area G, L202).

and a half old; five teeth belonged to animals that were at least two and a half years old.

In the Ayyubid and Mamluk level 52 sheep bones were identified, amounting to 90% of the total number of bones found in this level. Most of the bones were found in Area C (25), some in Area E (19) and a minority in Area A (5). With the exception of Area A, where only parts of the skulls and lower limbs were found, in the other two Areas all parts of the body were found. Only three bones were found with burn marks; all were excavated from or near a tabun (Figs. 10.3–10.4).

None of the bones bore cutting marks. There was probably a change in the management of the goats and sheep in this stratum, and they were consumed mainly for meat. Table 10.4 indicates consumption of about 50% of the flock at an early age and full utilization until age 4. Out of three lower jaws of sheep, one bore only milk teeth, one bore milk teeth and first molars (M1), and one jaw belonged to an adult individual with all its permanent teeth. It seems that after the fortress was sacked the flock was kept for meat only; hence the change in the pattern of consumption.

## Pigs

Both wild and domesticated pigs were found in the region during the Crusader period. Pigs were raised or hunted mainly for their meat. Their skins were rarely used. A total of 916 pig bones were found in the Crusader stratum, constituting 32.9% of the Crusader animal bones. Two bones were identified as belonging to a male pig (complete cranium and mandible with teeth). The vast majority of the pig bones were found in Area E (n=794), 41 of which were found in the large oven. The remainder were scattered in this area. Several pig skeletons were found in articulation, most of them charred, in Area A, in the north part of the fortress.

The pig bones belonged mostly to young animals. Table 10.5 summarizes the bone fusion data of the pigs and sums up their age at the time of death. From this table it can be clearly seen that almost half (47.2%) of the pigs were about a year

old. About two-thirds of the pigs (76.5%) reached the age of two–two and a half. Only about 8.7% of the pigs reached full maturity. The data regarding the age is supported by the analysis of the pigs' teeth. Table 10.8 shows that most of the lower jaws in which teeth were found belonged to young pigs that had milk teeth, or milk teeth alongside permanent teeth at an early stage of their growth.

Twenty percent of the pig bones were burnt — most of them whole bones. Single bones bore no signs of burning. Single bones should be interpreted as food remains, while the whole burnt skeletons are related the destructive conflagration inside the fortress. Only four bones bore cutting marks. The knucklebone (astragalus) of an adult pig found in the Area E oven bore a rough chop mark, indicating a severing of the lower leg. Knucklebones have almost no meat on them and are usually removed at the dismemberment stage.

Four ulnas of young pigs found in the Area E oven bore fine cutting marks on the proximal part. Cutting at this joint breaks off the central part of the front leg (the 'elbow').

Differentiating wild from domesticated pigs was difficult, and is based mainly on the form, chiefly of the skull, but also on differences in bone size. No method (or combination of methods) gives reliable, absolute results, because the wild boar and

**Figure 10.5.** Top: the burnt adult pig skull from the Crusader level (Area A, L176, B1265); Bottom: burnt adult pig jaw (photo by Ron Kehati).

**Figure 10.6.** Skull of an adult male pig from the Crusader level (left, Area A, L176, B1265) and a skull of a contemporary wild boar (right, author's collection, photo by Ron Kehati).

the domesticated pig are very close and there are feral populations of wild boars that have merged with domesticated pigs into a mixed species.[6]

Measurement of the pig bones found at the fortress showed an overlap in size that does not allow for unequivocal identification, since many of the bones belonged to very young pigs whose bones had not yet merged and had not reached their full size. Even a relatively complete skull of an adult pig did not provide a clear-cut species identification, although it is more similar to that of a wild boar (Fig. 10.5).

Pig bones were also discovered in the Ayyubid–Mamluk stratum, but in a much lower percentage than in the Crusader stratum. Only 17 pig bones were found, which make up 2.9% of the bones found in the Muslim level. Two skull bones were discovered in Area C and fifteen bones from all parts of the body in Area E. The bones from Area E belonged to infant pigs; two bones had faint burn marks.

## Cattle

Domestic cattle in the Crusader period served as a source of meat, milk and as a beast of burden in farmsteads. The value of the cattle as a meat supplier is larger than other farm animals due to its weight and its meat output which reaches as much as six times that of a pig and as much as seven times that of a sheep or a goat.[7]

Seventy-six cattle bones (*Bos taurus*) were discovered in the Crusader stratum; two bones came from the postern floor in Area C, and 11 bones from fills in the Area G postern. Most of the cattle bones were found in Area E (n=63). Only five of them were discovered in the large oven; the rest came from floors and fills. A single lower jaw

6 Rowley-Conwy, P., Umberto, A. and Dobney, K. Distinguishing Wild Boar from Domestic Pigs in Prehistory: A Review of Approaches and Recent Results. *Journal of World Prehistory* 25 (2012), 2, 36.

7 Croft, P. The Faunal Remains. In R. P. Harper and D. Pringle (eds.) *Belmont Castle* (Oxford, 2000), 175.

of a young cow bore cutting marks. It came from below the collapse of the vault in Area E.

Bone fusion data (Table 10.6) show that more than three-quarters of the cattle bones belonged to animals that were 2.5 years old and more; most of the cattle had probably reached maturity. The age determinations of the cattle are supported by the dental data. Out of the 34 teeth found in the Crusader level,[8] 20 were from upper jaws, of which two were worn milk teeth. The permanent teeth showed only medium wear. From lower jaws there were 14 teeth: two milk teeth and 12 permanent teeth with medium wear.

Sixty cattle bones were found in the Ayyubid and Mamluk stratum, constituting 10.4% of the total bones (Table 10.2). Most of the bones (n=45) were discovered in Area C and a minority in Area B (n=4), and Area E (n=6). In Area C, the bones include all parts of the skeleton except the femur, and all the bones without exception were found in tabun ovens (in the other two areas they do not originate in the tabun ovens). Only one bone bears burn marks; none of the bones bore any cutting marks. This suggests the bones were cooked in pots and did not come in direct contact with fire. The lack of cutting marks testifies to a skilled butcher who left no evidence of his work.

## Poultry

The domestic chicken (*Gallus gallus*) was common in the Levant since the Byzantine period. It was an important component in the diet of the inhabitants, a source of both meat and eggs (Fig. 10.7).

Thirty-six bones, that constitute 1.3% of the bone assemblage, were found in the Crusader level (Table 10.1). Nineteen of the bones were identified as belonging to hens (*Gallus gallus*). At least one bone was identified as belonging to a rooster according to a spur core at the tarso-metatarsus bone. Twenty-nine of the bones were recovered in Area E, 14 of which were found inside the large oven. Three of the chicken bones were not fused and belonged to a very young bird. One large

**Figure 10.7.** Chicken leg bones (*Galus galus*, photo by Roni Alush).

8 No jaws were found, and individual teeth are insufficient to gauge the age of the animal.

bird wing, whose species was not identified, bore a cutting mark. It is also the only bone that bore burn marks. The rest of the bones found in the oven bore no signs of burning.

Chickens were an important component of the Frankish diet. A lively trade in chickens is known from Jerusalem. At Har Hotzvim a chicken coop and chicken bones were discovered, and in Beit She'an, a pit was found containing many chicken bones. They were identified as the meal remains of the Crusader guards who occupied the site.[9] Chicken bones were found also at Belmont and Khan al-Ahmar.[10]

Fifteen poultry bones were found in the Muslim stratum of Jacob's Ford (Table 10.2). Twelve were identified as belonging to the domestic rooster and three to other birds. Thirteen of the bones were found in tabun oven fills, mainly in Area C, but also in other areas. Three of the bones bore burn marks, but not every bone from the oven fills bore such marks.

## Fish

Thirty-two fish bones were identified at Jacob's Ford, thirty from the Crusader period and two from the Ayyubid–Mamluk periods.[11]

From the Crusader period, one species of fish, the common catfish (*Clarias gariepinus*) was identified; other bones could not be identified to the species level. All parts of the skeleton are found in equal proportions in the assemblage, including parts of the skull, spine, and fins. Twenty-nine of the bones were found in Area E, 23 of them inside the large oven. Nineteen bones bore severe burn marks.

The common catfish is found in the Jordan River, its natural habitat. It is relatively easy to fish. The finds indicate that catfish was eaten on a regular basis.

A skull of a long-headed carp (*Barbus longiceps*) and another bone from the skull of a common catfish were found in the Ayyubid and Mamluk levels (Fig. 10.8).

Regulations of the military orders required the supply of fresh or salted fish, among other food products. The rules of the Hospitaller Order stipulated that on Fridays fish would be served as the main meal.[12]

**Figure 10.8.** Common catfish teeth from the Mamluk period (photo by Roni Alush).

9 Boas, A. J. *Domestic Settings: Sources on Domestic Architecture and Day-to-Day Activities in the Crusader States* (Leiden and Boston, 2010), 138.

10 Croft, Faunal Remains, 176.

11 The taxonomic identification was accomplished with the assistance of Professor Omri Lernau.

12 Bronstein, Y. The Hospitallers and the Templars, Food and Refractories in the Twelfth–Fourteenth Centuries. In I. Ziffer and O. Tal (eds.) *Last Supper in Apollonia* (Tel Aviv, 2011), 62–68 (Hebrew); Boas, *Domestic Settings*, 143.

## Molluscs

Seventeen mollusc shells were discovered in the excavations and identified by means of the reference collection in the National Shellfish Collection at the Steinhardt Museum of Natural History, Tel Aviv University.[13] *Melanopsis* shells, a freshwater snail, were found in the Crusader layer. They can still be found today in the Jordan River at the foot of the fortress. Two of the shells were found in a water installation. In addition to the above, four *Cypraeidae*, which may have originated in the Red Sea, and a *Unio terminalis terminalis* from the Sea of Galilee, were found (Fig. 10.9).

**Figure 10.9.** Shells (*Unio terminalis terminalis*) from the Sea of Galilee (photo by Roni Alush).

While all these molluscs are edible, they are rarely gathered as food, because of their small size and because they are not tasty. *Cypraeidae* shells are often used for decorative purposes. In the Muslim stratum, one *Melanopsis* and seven *Unio terminalis terminalis* were found. None of the molluscs from either period were found in the context of food preparation and there is no evidence that they were eaten.

## Other animals

Single bones of the following animals were recovered in the excavations:

*Camel*. The lower section of the metapodial was found below a pile of stones dated to the Crusader period (Area G, L229). A further bone, similar to the metapodial, was found in the Ayyubid–Mamluk level inside a tabun (Area C, L555). It belonged to a mature camel and had no cutting or burn marks.

*Dog*. Four dog bones were found in the Crusader layer. Two bones were found inside the large oven (Area E, L908, L918)—a part of the pelvis with burn marks and a hind leg (tibia) with a bite mark of some predator. One atlas vertebra was found in Area C among the collapse and an upper jaw tooth was found in a trough in Area E. In the Ayyubid–Mamluk stratum, an atlas vertebra of a dog was found in a tabun (Area C, L555), and two more metapodials of adult dogs were discovered in fills related to the Ayyubid–Mamluk stratum.

*Fox*. A front leg (ulna) of a young fox was found in the Ayyubid–Mamluk layer inside a tabun (Area K, L732). It did not bear burn or cut marks.

*Cat*. Two lower jaws of two adult cats were found in the Crusader layer, both in Area E, one in the rectangular trough and the other next to the

13 The mollusc shells were identified with the help of Henk Mienis.

main gate. Another finger of an animal from the cat family (Felidae) was found in Area C.

*Deer*. Two deer bones, a metatarsus and a phalange 1, were found in Area E in the Crusader level. Both probably belonged to the Carmel Deer (*Capreolus capreolus*).

*Badger*. One whole arm bone belonging to an adult was found with cutting marks.

## Treatment of the Bones

### Cutting marks

The majority of the bones had no cutting marks, even in places where the knife was typically used in the dismembering of the animal. This may indicate the work of a skilled butcher who had confidence in his craft and left no such marks on the bones. The fact that the fortress had an organized kitchen suggests that the cooks left the task of dismemberment in the hands of an expert butcher. Dismemberment of an animal body using the joints as dislocation points, using sharp butchering knives together with an understanding of anatomy, allows efficient work that does not damage the bones and does not leave cutting marks.

A whole humerus of a badger (*Meles*) was found with cutting marks (Fig. 10.10). The marks were made by a sharp knife and appear in the lower third of the bone shaft on its anterior side. The cutting is typical of the fur removal technique (though fur can be removed without leaving such marks).

Cutting marks appeared on a number of bones at the midpoints of long bone shafts in a manner not typical of the dissection phase. This is evidence of inefficient butchering requiring unwarranted effort (Fig. 10.11). This kind of cutting may be related to an attempt to divide portions evenly according to weight.

A similar technique probably existed in Roman army camps, where each soldier was rationed of a certain weight of meat. Stokes analysed the cutting marks on cattle bones from a Roman army camp in South Shields, England, and observed the multiplicity of large bone fragments and cutting marks in unusual places. He suggested that this was an attempt to divide the meat into equal portions so

**Figure 10.10.** Cutting marks on a humerus of a badger (*Meles*) (photo by Roni Alush).

**Figure 10.11.** Cutting marks in the central shaft (photo by Roni Alush).

that each soldier received a similar meal, ignoring the anatomy of the animal.[14]

**Burn Marks**

All the bones in the Crusader stratum (n=886) bore burn marks to one degree or another. This is unusual. Bones found in the vicinity of a significant heat source change colour. Experiments have shown that it is difficult to determine the exact temperature of the fire from the color of the bone, but a range of temperatures can be attributed to each colour.[15] Experiments in which bones were burnt in various ways revealed two clear stages: initial carbonization and then oxidation. In the first stage, the collagen coalesces and the bone becomes black; in the second stage, the black carbon oxidizes and the bone becomes calcareous and white. At the latter stage the bone sometimes becomes distorted. At extremely high temperatures, the bone is completely destroyed.[16]

Bones that were heated to a temperature of up to 400 degrees Celsius become yellowish, bones that were heated to a temperature between 300–800 degrees acquire a yellow/red to red/purple hue and bones heated above 600 degrees for a considerable length of time became lilac/blue to blue. Bones that were completely burned at a higher temperature tended to turn blue/white to grey.[17]

Additional experiments have concluded that under natural burning conditions (i.e., not controlled by humans), bone rarely oxidizes. Bones become completely burnt on all sides only if the bone was burned after the meat was removed or the bone with the meat was in the fire for a long time.[18]

Of the total amount of burnt bones, 391 were found in the large oven (Area E, L908/915/918). Unlike the small household tabun oven, the large oven in the southeast corner of the fortress was used to prepare food for the entire population that lived and worked on the site.[19]

Forty-six of these bones bore burn marks in colours that indicated a temperature of up to 800 degrees (yellowish, reddish, black, bluish) and 264 bones bore grey/white and white colouring indicating temperatures above 800 degrees. It should be noted that bones with no burn marks at all were also found in the oven and were probably cooked in a closed pot or roasted while the meat was wrapped in some insulating material that prevented the bones from being scorched. Presumably, the reason for the presence of burnt bones in the large oven is related to the preparation of food. It is also possible that the active oven was abandoned when the Muslim force breached the walls and entered the fortress, and that its contents burned. Possibly, too, the oven was used by the Muslims for the disposal of animal corpses.

The oven contained the remains of pigs, cattle, fish, crabs, deer, goats, sheep and chickens. In addition, part of a pelvis and a hind limb (tibia) bearing bite marks of an animal from the feline family were found. The body parts of the various animals include all the skeletal parts, including the lower limbs and toes.

---

14 Stokes, P. A cut above the rest? Officers and men at South Shields Roman fort. In P. Rowley-Conwy (ed.) *Animal Bones, Human Societies* (Oxford, 2000), 147.

15 Shipman P., Foster, G. and Schoeninger, M. Burnt bones and teeth: an experimental study of colour, morphology, crystal structure and shrinkage. *Journal of Archaeological Science* Vol 11/4 (1984), 307–325.

16 Lyman, R. L. *Vertebrate Taphonomy.* Cambridge Manuals in Archaeology (Cambridge, 1994), 385.

17 Shipman P. et al., Burnt bones and teeth; Lyman, *Vertebrate Taphonomy*, 389.

18 Lyman, *Vertebrate Taphonomy*, 389.

19 See Chapter 4.

The rest of the bones that bear burn marks were found on floors and below the collapsed barrel vault. Burned skeletons of animals were found in the Crusader destruction layer. The corpses were intentionally burned or caught fire in the course of the battle. In some cases, the bones were charred black and had a shimmering hue that was the result of a low-oxygen fire. This indicates that some of the animals' bodies burnt for many hours, and possibly days, while buried under the collapsed debris, or that the bodies were burned in piles. In this case, the corpses at the bottom of the pile burned in a low-oxygen environment. Some of the burned bones were found at the entrance and on the floor of the oven (Area E, L918) and may have been used as combustible material.[20] Bones can be considered a fuel, providing they are fresh.[21] The fat left on the bones, bone marrow and the spongy parts at the ends of the bones burn quicker.

The percentage of burnt bones was significantly lower in the Ayyubid and Mamluk stratum. Only 7.7% of the bones (n=46) had burn marks; 62.2% of the bones in this layer originated in tabun ovens and only 3% of these bones (n=18) were found to be burnt. The tabun ovens contained the remains of cattle, pigs, fish, and chickens. All parts of the skeletons were found in these assemblages, including lower limbs and skulls that are often considered butcher's leftovers,

Thirty-three of the bones bore burn marks in colours that indicated a temperature range of up to 800 degrees (yellowish, reddish, black, bluish) and thirteen bones bore burn marks in grey/white and white, colours indicating temperatures above 800 degrees. As in the Crusader oven, in the tabun ovens, too, there were bones that did not bear burn marks. Again, this probably indicates they were cooked in closed vessels.

**Figure 10.12.** Pig vertebrae (Area E, L873, B8576) from the Crusader stratum with holes and significant deformities (photograph by Roni Alush).

**Pathologies**

A group of four pig vertebrae (L873, B8576) from the Crusader stratum in Area E had a pathology characterized by holes and significant deformities in the bones (Fig. 10.12).

The "holes" in the two vertebrae are a deformity of the bone indicating lysis (lack of bone) or bone proliferation (rapid culture of bone cells), probably caused by inflammation (spondylitis

20 Motro, H., Rabinovich, R. and Ellenblum, R. Equid and Mule Skeletons at the Crusader Battlefield — What can we learn from them? In O. Ackerman, A. Faust and A. Maeir. *Archaeology and Environment 25th Conference* (Bar Ilan University, 2005), 89–104 (Hebrew).

21 In an experiment carried out in 2020, I placed cattle bones in an open fire and some of them burned well until they were completely consumed.

**Figure 10.13.** A bone flute (Area A, L162, B1210) found in the Crusader stratum, made from the wing bone (ulna) of an eagle (photograph by Roni Alush).

or osteomyelitis).[22] The fact that there are at least two such vertebrae suggests that the cause was an infection. However, this pathology may also be attributed to a load on the vertebrae or a genetic problem.[23] This type of vertebral deformation is typical of domesticated pigs.[24]

A rare bone flute (Fig. 10.13) was found in a clear context of the Crusader battle stratum at the northern edge of the fortress, between the fortress wall and the mosque, in a layer of ash next to a charred wooden beam, pig bones, human bones and five iron arrowheads.

Parts of the flute are missing. Its preserved length is 167 mm, its width in the centre is 13.27 mm, and the thickness at the same point is 11.41 mm. The flute is made from the left wing bone (ulna) of an eagle (*Gyps fulvus*). The preserved part constitutes about two-thirds of the bone — the central and distal part. At one end of the flute (belonging to the distal part of the original bone), a fingering or embouchure hole can still be seen.

The irregular hole was probably made with a knife or was first drilled and then shaped with a knife. The remains of another hole is 20.58 mm from the first (in the proximal direction of the original bone; the distance is measured at the two closest points of the holes to each other). This hole is also irregular; its diameter is 6.3–6.45 mm. Further down the bone in its proximal direction, at a distance of 25.75 mm, there is a mark made with a sharp knife for the next hole. This tiny marking, and the fact that in a similar traditional flute there are six holes, suggest that the flute was in preparation. Signs of a file can be seen along its entire length. The file marks are in the same places where the feather muscles (ulnar papillae/quill knobs) existed. These small bumps, located along the ulna bone, interfered with the smooth movement of the player's fingers,

22 The bones were examined by Dr. Itzhak Aizenberg from the University Veterinary Hospital, Rehovot, Israel.
23 https://www.infomed.co.il/diseases/spondylitis/.
24 According to Dr. Liora Horwitz (archaeozoologist) who also examined the bones.

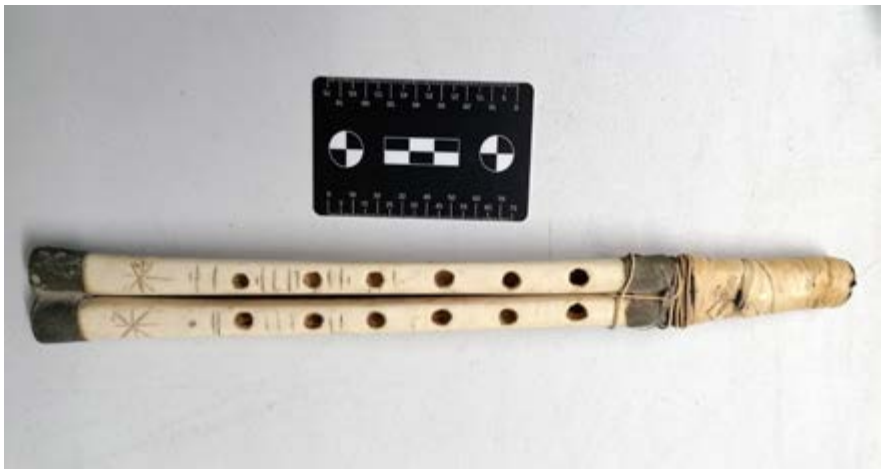


**Figure 10.14.** A double pipe Bedouin flute known as a *majawz* made from the wing bones of an eagle (photo by Ron Kehati). This flute was on display in the now defunct Joe Alon Museum for Bedouin Culture. It was made by a member of the Negev Bedouin Abū Rabīʿa tribe. The bone is reinforced with metal bands, wire, and a sticky plastic tape.

which required their removal. There is a Bedouin tradition of building flutes from the wing bones of an eagle, usually a two-cane flute known as a *majawz* (Fig. 10.14). To date, no flute of an eagle bone has been found in archaeological excavations and the flute from Jacob's Ford is the first of its kind.

A documentary by Tal Bartov describes the construction of such a flute from two wing bones (ulnae) of an eagle. He presents Rajah Morrissat from the town of Deir Hanna, who built such a flute in which six holes pierce each bone.[25] The holes were prepared using a red hot piece of iron.[26] The bones were fastened together with string and beeswax. The mouthpiece was the last part to be added. Morrissat explains that the distance between holes is like the width of his finger, and is not always very precise.

The flute from the fortress had not been finished, the bone is incomplete, and it is only half of a double-pipe flute. Nevertheless, it is clearly a *majawz* flute in preparation. This conclusion derives from the use of a specific bone (ulna) of a specific bird — the eagle. Similar long, hollow parts of the eagle skeleton and those of other animals were also used to make wind instruments. Making flutes from eagle bones was also a European tradition. Similar long, hollow bones could be used for other purposes, such as drinking and sniffing straws, and cannot always be distinguished from wind instruments, especially if the artifacts are incomplete.

The flute from Jacob's Ford is further evidence of how life in the fortress ended in one fell swoop.

Another worked bone found in the excavations is an astragalus or knucklebone (tibial tarsal bone). The intact bone, that belonged to a goat or a sheep, was excavated from the Crusader layer in the western postern, in the fill above the floor (Area G, L213, Basket 7208). The bone bears signs of abrasion and levelling directed at its dorsal and ventral sides in a way that makes them flat and straight along the entire surface (Fig. 10.15). On the medial and lateral sides there are slight abrasion marks that hardly changed the bone surface; on the proximal and distal ends there are no abrasion marks at all.

25 Bartov, T. When I Play, the Eagle Sings. *Masa Acher* (2009); https://www.masa.co.il/article/כשאני-מנגן-הנשר-שר.

26 According to Etan Ayalon, who met with Morrissat, a red-hot punch was used to burn the holes; the bone is too delicate for drilling. The flute from Jacob's Ford shows no sign of the use of hot metal and the holes were clearly made in a different manner. See Ayalon, E. *The Assemblage of Bone and Ivory Artifacts from Caesarea Maritima, Israel 1st-13th Centuries CE*. BAR International Series 1457 (Oxford, 2005), 46.

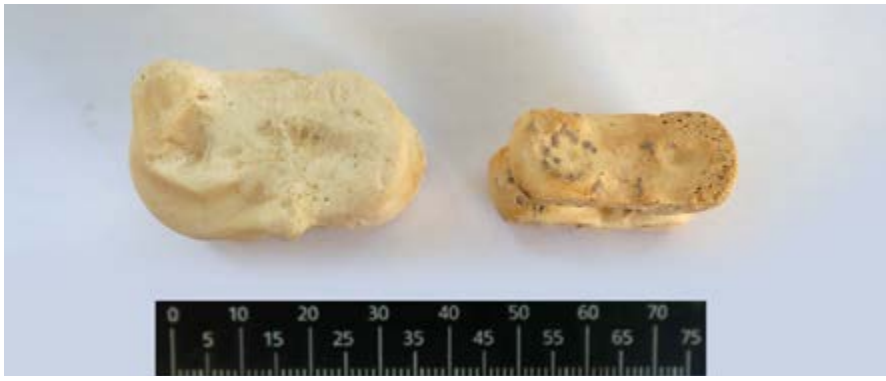



**Figure 10.15.** A polished knucklebone (astragalus) of a goat or sheep (photo by Ron Kehati).


**Figure 10.16.** Bone die from the Crusader level (photo by Hadas Motro).

Astragalus bones processed in this way are well known from many periods and were commonly used for play, fortune telling or gambling, or as offerings, decorative items, good luck charms, and possibly for other purposes. It is not unusual to find astragalus bones together; they were often kept in a cloth or leather bag, or a clay vessel.[27]

Game bones are also known from Europe, and finding such a bone in the Crusader layer is not necessarily related to a local person who was in the service of the Templars, or a local custom adopted by a European soldier. It may have been brought over or made by one of the soldiers.

A bone die (Fig. 10.16), measuring 6.94–7.36 mm, was found in the Crusader layer (Area A, L125 B1206). The cube may have been carved from the hind leg of a large animal. Series of two concentric circles are engraved on its six sides, fashioned using a tool called a *center bit*. This device, in the present case, had the shape of a fork with two options for arranging the "teeth": a central tooth slightly longer than two pairs of teeth on either side of it, a side tooth longer than the other, and two teeth next to it. In both options, the tool is operated by inserting the long tooth into the bone and rotating the device around this tooth so that the other tooth inscribes a circle around it. Similar dice were discovered in the Crusader fortress at Atlit[28] and Caesarea, where the researcher notes that they were made from the hind leg bones (metatarsus) of cattle.[29] Similar to the lone astragalus found in the fort at Jacob's Ford, we do not know whether the die was used in simple games of chance and gambling or in more complex dice games.

27 Sade M. Archaeozoological Finds from Strata IX–III and Z. Herzog and L. Singer-Avitz (eds.) *Beer-Sheba* III. *The Early Iron IIA Enclosed Settlement and the Late Iron IIA — Iron IIB Cities*, Vols. I–III. Monograph Series of the Institute of Archaeology of Tel Aviv University 33 (Tel Aviv, 2016).

28 Johns C. N. Excavations at Pilgrims' Castle, Atlit (1932). *QDAP* III (1934): 145–164, Pl. LX.

29 Ayalon, *The Assemblage of Bone*, 252–253.

## Discussion

The bones from the fortress of Jacob's Ford belong to a precise time and space — a time capsule containing the story of the fort; its daily life and its violent end.

The pig bones are dominant among the Crusader animal bones, followed by the sheep and then the cattle. In similar sites from the period, such as the Crusader fortress of Yoqneam, sheep are dominant and constitute more than 50% of the bones while pig bones constitute only 2%.[30] In the Crusader fortress of Belmont in the Jerusalem mountains, sheep make up 37.9% of the assemblage, cattle make up 27.3% and pigs 34.8%.[31] Twelfth–century assemblages were excavated in two Crusader fortresses in Jordan. At al-Wu'ayra castle, sheep were found to be dominant (ca. 230 bones), while pig came second (ca. 30 bones) and cattle third, with a few single bones. At the fortress of Shawbak, sheep were also the dominant animal (ca. 58 bones); pig and cattle followed (ca. 18 bones each).[32]

The dominance of pig bones at Jacob's Ford may be due to the men's preference for pork. It is also an animal that is relatively easy to raise in a closed fortress during times when they cannot be let out to graze.

All the assemblages in Crusader fortresses are similar in that there is a complete reliance on domesticated farm animals. There are few bones that belong to wild animals (Carmel deer and badger in Jacob's Ford, red deer in Belmont Fortress and Yoqneam, partridges in fortresses in Jordan). It seems that hunting was only for food, sports and perhaps for obtaining raw materials such as horns, feathers for arrows, skins, and the like. The members of the Crusader military orders who manned the various forts lived according to strict regulations. According to the Templar rule hunting was banned, but the "gathering" of fish, poultry and wild animals was allowed, a kind of loophole that enabled some reliance on wildlife.[33]

Comparison between the Crusader and the Ayyubid–Mamluk periods at Jacob's Ford clearly shows a decrease in the consumption of pork (from 33% to 3%) from the Crusader period to the Muslim period, a similar decrease in the consumption of sheep, and an increase in the consumption of beef. It seems that the Muslims, who refrained from eating pork, killed the pigs that were on the site and took the sheep and cattle as booty. I have no explanation for the pig bones found in the Ayyubid–Mamluk level. Similar results, however, were found in other Crusader fortresses which the Muslims occupied.[34]

At Jacob's Ford, sheep came second to the pig in terms of quantity. Very few bones specifically belonging to either sheep or goat were clearly identified. At Belmont Fortress, Croft concluded that the Crusaders kept an equal number of goats and

30 Kolska Horwitz, L. and Dahan, E. Animal Husbandry Practices during the Historic periods. In A. Ben-Tor, M. Avissar and Y. Portugali (eds.) *Yoqne'am* I: *The Late Periods*. Qedem Reports, Vol. 3 (Jerusalem, 1996), 246–247.

31 Croft, Faunal Remains, 186, Table 1.

32 Mazza, P. and Corbino C. The Crusader's food: faunal analyses. The faunal remains from UT 83 at Al-Wu'ayra and from Area 10000 at Shawbak castle. In G. Vannini and M. Nucciotti (eds.) *'Medieval' Petra — Shawbak Project Archaeological Season 2007* (Amman, 2007), 55–62.

33 Bronstein, The Hospitallers and the Templars, 62–68.

34 For example, at Belmont fortress, where a decline can be seen from 34.8% in the 12th century to less than 10% in later centuries. See Croft, Faunal Remains, 186, Table 2.

sheep in their flocks. This contrasts with the preference for goats in the centuries that followed. The reason may have been the use of sheep wool among the Franks.[35] It is possible that the flocks of Jacob's Ford were managed in this way, although this cannot be proven.

Unlike members of other monastic orders, members of the military orders were allowed to eat meat. The orders were instructed to provide their members with up to three meat meals a day: including beef, mutton and chicken stews. In some sites fish was also included (Apollonia). The variety of animals found at Jacob's Ford could certainly fulfil the needs of the members of the order and even provide meat for the Muslim prisoners who worked in the construction of the fortress and were prohibited from eating pork.[36]

**Table 10.1.** Animal species from the Frankish level of Vadum Iacov

| SPECIES | COMMON NAME | AREA A | | AREA B | | AREA C | | AREA E | | AREA G | | AREA K | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % |
| *Capra hircus* | Goat | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.1 | 0 | 0.0 | 0 | 0.0 | **3** | **0.1** |
| *Ovis aries* | Sheep | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.1 | 0 | 0.0 | 0 | 0.0 | **3** | **0.1** |
| *Ovis/Capra* | Sheep/Goat | 2 | 0.9 | 0 | 0.0 | 38 | 16.4 | 169 | 7.6 | 10 | 12.5 | 0 | 0.0 | **219** | **7.9** |
| *Sus* | Pig | 109 | 47.2 | 0 | 0.0 | 12 | 5.2 | 794 | 35.5 | 1 | 1.3 | 0 | 0.0 | **916** | **32.9** |
| *Bos taurus* | Cattle | 0 | 0.0 | 0 | 0.0 | 2 | 0.9 | 63 | 2.8 | 11 | 13.8 | 0 | 0.0 | **76** | **2.7** |
| *Camelus bactrianus* | Camel | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.3 | 0 | 0.0 | **1** | **0.0** |
| *Cervidae* | Deer | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 | **2** | **0.1** |
| *C preolus capreoul* | Roe Deer | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 | **2** | **0.1** |
| *Canis* | Canine | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 3 | 0.1 | 0 | 0.0 | 0 | 0.0 | **4** | **0.1** |
| *Vulpes* | Fox | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *meles* | Badger | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *Felidae* | Cat | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 | **3** | **0.1** |
| | Small Mammal | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 2 | 0.1 | 1 | 1.3 | 0 | 0.0 | **4** | **0.1** |
| | Medium Mammal | 113 | 48.9 | 0 | 0.0 | 168 | 72.4 | 871 | 38.9 | 35 | 43.8 | 0 | 0.0 | **1187** | **42.7** |
| | Large Mammal | 1 | 0.4 | 0 | 0.0 | 8 | 3.4 | 219 | 9.8 | 18 | 22.5 | 0 | 0.0 | **246** | **8.8** |
| *Procavia capensis* | Syrian Hyrax | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | **1** | **0.0** |
| | Micro Fauna | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 4 | 0.2 | 0 | 0.0 | 0 | 0.0 | **5** | **0.2** |
| *Aves* | Birds | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 14 | 0.6 | 2 | 2.5 | 0 | 0.0 | **17** | **0.6** |

35 Croft, Faunal Remains, 175.

36 Abū Shāma, *Kitāb al-rawḍatayn* 3, 43.

| SPECIES | COMMON NAME | AREA A | | AREA B | | AREA C | | AREA E | | AREA G | | AREA K | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % |
| *Galus galus domesticus* | Chicken | 3 | 1.3 | 0 | 0.0 | 1 | 0.4 | 15 | 0.7 | 0 | 0.0 | 0 | 0.0 | **19** | **0.7** |
| *Cyclosto-mata* | Fish | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 12 | 0.5 | 0 | 0.0 | 0 | 0.0 | **12** | **0.4** |
| *Clarias gariepinus* | Catfish | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 17 | 0.8 | 0 | 0.0 | 0 | 0.0 | **18** | **0.6** |
| *Barbus longiceps* | Jordan barbel | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| Melanopsis | Freshwater snail | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.3 | 0 | 0.0 | **1** | **0.0** |
| *Melanopsis costata* | Freshwater snail | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 | **2** | **0.1** |
| *Cypraeidae* | *cowries* | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.2 | 0 | 0.0 | 0 | 0.0 | **4** | **0.1** |
| *Unio terminalis terminalis* | | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 | **2** | **0.1** |
| *Potamon potamios* | semi-terrestial carb | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 39 | 1.7 | 0 | 0.0 | 0 | 0.0 | **39** | **1.4** |
| | *Unidentified* | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| **NISP TOTAL** | | **231** | **100.0** | **0** | **0.0** | **232** | 100.0 | **2237** | 100.0 | **80** | 100.0 | **0** | **0.0** | **2780** | **100.0** |

**Table 10.2.** Animal species from the Mamluk level of Vadum Iacov

| SPECIES | COMMON NAME | AREA A | | AREA B | | AREA C | | AREA E | | AREA G | | AREA K | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % |
| *Capra hircus* | Goat | 1 | 1.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.9 | 0 | 0.0 | 0 | 0.0 | **3** | **0.5** |
| *Ovis aries* | Sheep | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *Ovis/Capra* | Sheep/ Goat | 5 | 5.2 | 0 | 0.0 | 25 | 10.5 | 19 | 8.3 | 0 | 0.0 | 0 | 0.0 | **49** | **8.5** |
| *Sus* | Pig | 0 | 0.0 | 0 | 0.0 | 2 | 0.8 | 15 | 6.5 | 0 | 0.0 | 0 | 0.0 | **17** | **2.9** |
| *Bos taurus* | Cattle | 6 | 6.2 | 0 | 0.0 | 45 | 18.8 | 8 | 3.5 | 0 | 0.0 | 1 | 11.1 | **60** | **10.4** |
| *Camelus bactrianus* | Camel | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **1** | **0.2** |
| *Cervidae* | Deer | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |

| SPECIES | COMMON NAME | AREA A | | AREA B | | AREA C | | AREA E | | AREA G | | AREA K | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % |
| *C. preolus capreoul* | Roe Deer | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *Canis* | Canine | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 2 | 0.9 | 0 | 0.0 | 0 | 0.0 | **3** | **0.5** |
| *Vulpes* | Fox | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 11.1 | **1** | **0.2** |
| *meles* | Badger | 1 | 1.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **1** | **0.2** |
| *Felidae* | Cat | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| | Small Mammal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 1 | 25.0 | 1 | 11.1 | **3** | **0.5** |
| | Medium Mammal | 45 | 46.4 | 0 | 0.0 | 36 | 15.1 | 152 | 66.1 | 1 | 25.0 | 3 | 33.3 | **237** | **40.9** |
| | Large Mammal | 32 | 33.0 | 0 | 0.0 | 119 | 49.8 | 27 | 11.7 | 1 | 25.0 | 1 | 11.1 | **180** | **31.1** |
| Procavia capensis | Syrian Hyrax | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| | Micro Fauna | 1 | 1.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | **2** | **0.3** |
| Aves | Birds | 0 | 0.0 | 0 | 0.0 | 2 | 0.8 | 0 | 0.0 | 0 | 0.0 | 1 | 11.1 | **3** | **0.5** |
| Galus galus domesticus | Chicken | 1 | 1.0 | 0 | 0.0 | 8 | 3.3 | 1 | 0.4 | 1 | 25.0 | 1 | 11.1 | **12** | **2.1** |
| Cyclostomata | Fish | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| Clarias gariepinus | Catfish | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | **1** | **0.2** |
| Barbus longiceps | Jordan barbel | 1 | 1.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **1** | **0.2** |
| Melanopsis | Freshwa-ter snail | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *Melanopsis costata* | Freshwa-ter snail | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | **1** | **0.2** |
| *Cypraeidae* | *cowries* | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| *Unio terminalis terminalis* | | 5 | 5.2 | 0 | 0.0 | 0 | 0.0 | 2 | 0.9 | 0 | 0.0 | 0 | 0.0 | **7** | **1.2** |
| *Potamon potamios* | semi-ter-restial carb | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| | *Unidenti-fied* | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | **0** | **0.0** |
| **NISP TOTAL** | | **97** | 100.0 | **0** | **0.0** | **239** | 100.0 | **230** | 100.0 | **4** | 100.0 | **9** | 100.0 | **579** | **100.0** |

**Table 10.3.** Body part distribution*

| BODY PART | | FRANKISH LEVEL | | | |
|---|---|---|---|---|---|
| | OVIS ARIES, CAPRA HIRCUS AND OVIS/CAPRA | | BOS TAURUS | | |
| | NISP* | % | NISP | % | |
| Cranial | Maxilla, Mandible, loose teeth | 85 | 37.8% | 36 | 47.4% |
| Upper Forelimbs | Humerus, Scapula | 27 | 12.0% | 7 | 9.2% |
| Upper Hindlimbs | Femur, Pelvic | 11 | 4.9% | 2 | 2.6% |
| Middle Forelimb | Radius, Ulna | 6 | 2.7% | 5 | 6.6% |
| Middle Hindlimbs | Tibia, Fibula, Patella | 16 | 7.1% | 0 | 0.0% |
| Lower Forelimb | Carpal, Metacarpal | 11 | 4.9% | 3 | 3.9% |
| Lower Hindlimb | Tarsal, Metatarsal | 25 | 11.1% | 6 | 7.9% |
| Feet | Phalanx | 37 | 16.4% | 8 | 10.5% |
| Forelimb | "long bone" fragment | 0 | 0.0% | 0 | 0.0% |
| Hindlimb | "long bone" fragment | 0 | 0.0% | 0 | 0.0% |
| Limb | "long bone" fragment | 0 | 0.0% | 1 | 1.3% |
| Lower limbs | Carpal/Tarsal, Metapodial | 7 | 3.1% | 4 | 5.3% |
| Trunk | Vertebras, Ribs, Sternum | 0 | 0.0% | 4 | 5.3% |
| **TOTAL** | | **225** | **100.0%** | **76** | **100.0%** |

*identified specimens

**Table 10.4.** Fusion by month for Ovis Capra

| | | | FRANKISH LEVEL | | | MAMLUK LEVEL | | |
|---|---|---|---|---|---|---|---|---|
| STAGE | ELEMENT | FUSION AT (MONTHS) | FUSED | UNFUSED | % DEAD | FUSED | UNFUSED | % DEAD |
| | Metacarpus P. | Before birth | 0 | 0 | | 0 | 0 | |
| | Metatarsal P. | Before birth | 0 | 0 | | 0 | 0 | |
| **Infant** | Scapula, bicipital tuberosity | 7-10 | 0 | 1 | | 0 | 0 | |
| | Phalanx 1 P. | 18-24 | 0 | 0 | | 0 | 1 | |
| | Phalanx 2 P. | 18-24 | 0 | 0 | | 0 | 0 | |
| | Humerus D. | 12-18 | 12 | 2 | | 2 | 1 | |
| | Radius P. | 12-18 | 0 | 0 | | 0 | 0 | |
| **Total** | | | **12** | **3** | **20.00%** | **2** | **2** | **50.00%** |
| **Juvenile** | Metacarpus D. | 24-30 | 2 | 0 | | 0 | 0 | |
| | Tibia D. | 24-30 | 6 | 2 | | 1 | 0 | |
| | Metapodial D. | | 5 | 1 | | 0 | 0 | |
| | Metatarsal D. | 27-36 | 0 | 0 | | 0 | 0 | |
| **Total** | | | **13** | **3** | **18.75%** | **1** | **0** | **0.00%** |

| | | | FRANKISH LEVEL | | | MAMLUK LEVEL | | |
|---|---|---|---|---|---|---|---|---|
| **STAGE** | **ELEMENT** | **FUSION AT (MONTHS)** | **FUSED** | **UNFUSED** | **% DEAD** | **FUSED** | **UNFUSED** | **% DEAD** |
| **Sub-adult** | Ulna D. | 30 | 0 | 0 | | 0 | 0 | |
| | Ulna, olecranon | 30 | 0 | 0 | | 0 | 0 | |
| | Femur P. | 42 | 0 | 0 | | 0 | 0 | |
| | Tarsal Calcaneum, tuber calcis | 42-48 | 1 | 6 | | 0 | 1 | |
| | Radius D. | 42-48 | 0 | 0 | | 0 | 1 | |
| | Femur D. | 42-48 | 0 | 6 | | 0 | 1 | |
| | Humerus P. | 42-48 | 0 | 1 | | 0 | 0 | |
| | Tibia P. | 42-48 | 0 | 2 | | 0 | 0 | |
| **Total** | | | **1** | **15** | **93.75%** | **0** | **3** | **100.00%** |

All fusion data from Silver 1969 exept Phalanx 1/2, from Schmid 1972

*the first to fuse is fully fused and the other one is unfused

P. - proximal D. - distal

**Table 10.5.** Fusion by month for Sus

| | | FRANKISH LEVEL | | | MAMLUK LEVEL | | |
|---|---|---|---|---|---|---|---|
| | **ELEMENT** | **FUSED** | **UNFUSED** | **% DEAD** | **FUSED** | **UNFUSED** | **% DEAD** |
| **Infant (below about 1 year of age)** | Scapula Distal | 0 | 0 | | 0 | 0 | |
| | Humerus Distal | 2 | 9 | | 0 | 0 | |
| | Radius Proximal | 2 | 3 | | 0 | 0 | |
| | Phalanx 2 | 24 | 13 | | 0 | 0 | |
| | **Total** | **28** | **25** | **47.2%** | **0** | **0** | **0.0%** |
| **Juvenile (1 year to 2-2.5 years of age)** | Tibia Distal | 1 | 5 | | 0 | 1 | |
| | Fibula Distal | 1 | 0 | | 0 | 0 | |
| | Calcaneum | 3 | 9 | | 0 | 0 | |
| | Phalanx 1 | 15 | 52 | | 0 | 2 | |
| | Metapodial Distal | 3 | 9 | | 0 | 0 | |
| | **Total** | **23** | **75** | **76.5%** | **0** | **3** | **100.0%** |
| **Sub-adult (2-2.5 years to 3-3.5 years of age)** | Humerus Proximal | 0 | 10 | | 0 | 0 | |
| | Ulna Proximal | 0 | 1 | | 0 | 0 | |
| | Radius Distal | 1 | 12 | | 0 | 0 | |
| | Femur Proximal | 0 | 4 | | 0 | 0 | |
| | Femur Distal | 3 | 12 | | 0 | 1 | |
| | **Tibia Proximal** | 0 | 3 | | 0 | 0 | |
| | **Total** | **4** | **42** | **91.3%** | **0** | **1** | **100.0%** |

**Table 10.6.** Fusion by month for Bos taurus

| | | FRANKISH LEVEL | | | MAMLUK LEVEL | | |
|---|---|---|---|---|---|---|---|
| | ELEMENT | FUSED | UNFUSED | % DEAD | FUSED | UNFUSED | % DEAD |
| **Infant (below about 1 year of age)** | Scapula Distal | 0 | 0 | | 0 | 0 | |
| | Humerus Distal | 1 | 0 | | 1 | 0 | |
| | Radius Proximal | 0 | 0 | | 0 | 0 | |
| | Phalanx 2 | 3 | 0 | | 2 | 0 | |
| | **Total** | **4** | **0** | **0.0** | **3** | **0** | **0.0** |
| **Juvenile (1 year to 2-2.5 years of age)** | Tibia Distal | 0 | 0 | | 0 | 0 | |
| | Fibula Distal | 0 | 0 | | 0 | 0 | |
| | Calcaneum | 1 | 2 | | 1 | 0 | |
| | Phalanx 1 | 2 | 0 | | 4 | 0 | |
| | Metapodial Distal | 2 | 0 | | 0 | 0 | |
| | **Total** | **5** | **2** | **28.6** | **5** | **0** | **0.0** |
| **Sub-adult (2-2.5 years to 3-3.5 years of age)** | Humerus Proximal | 0 | 0 | | 0 | 0 | |
| | Ulna Proximal | 0 | 0 | | 0 | 0 | |
| | Radius Distal | 0 | 0 | | 0 | 0 | |
| | Femur Proximal | 0 | 0 | | 0 | 0 | |
| | Femur Distal | 0 | 0 | | 0 | 0 | |
| | Tibia Proximal | 0 | 0 | | 0 | 0 | |
| | **Total** | **0** | **0** | **0.0** | **0** | **0** | **0.0** |

**Table 10.7.** Ovis, Capra and Ovicapra tooth eruption, from loose teeth and mandibles with teeth.

| | | M3L ERUPTING 18–24 MONTHS | | P4L ERUPTING 21–24 MONTHS | | DP4L ERUPTING BIRTH TO 6 WEEKS | |
|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % |
| Unerupted (unworn) | | 6 | 26 | 1 | 14 | 1 | 7.7 |
| Fully Erupted | Unworn | 0 | 0 | 0 | 0 | 0 | 0.00 |
| | Slightly worn | 3 | 13 | 1 | 14 | 6 | 46.2 |
| | Worn (with infundibulum) | 14 | 61 | 4 | 57 | 2 | 15.4 |
| | Very worn | 0 | 0 | 1 | 14 | 0 | 0.00 |
| | Extremely worn | 0 | 0 | 0 | 0 | 4 | 30.8 |
| **TOTAL** | | **23** | **100** | **7** | **99** | **13** | **100** |

**Table 10.8.** Sus tooth eruption (from loose teeth and mandibles with teeth)

| | | DP4L ERUPTING AT 4 WEEKS | | P4L ERUPTING AT 16 MONTHS | | M1L ERUPTING AT 6 MONTHS | | M2L ERUPTING AT 13 MONTHS | | M3L ERUPTING AT 25 MONTHS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NISP | % | NISP | % | NISP | % | NISP | % | NISP | % |
| Unerupted (unworn) | | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 0 | 0 | 0 |
| Fully Erupted | Slightly worn | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Worn (with infundibulum) | 8 | 10 | 15 | 88 | 10 | 83 | 1 | 25 | 0 | 0 |
| | Very worn | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extremely worn | 0 | 0 | 2 | 12 | 2 | 17 | 2 | 50 | 2 | 10 |
| **TOTAL** | | **8** | **10** | **17** | **10** | **12** | **10** | **4** | **10** | **2** | **10** |

CHAPTER 11

# A UNIQUE SMALL MAMMAL ASSEMBLAGE FROM VADUM IACOB FORTRESS: INSIGHTS FOR THE SITE DESTRUCTION PROCESS AND ENVIRONMENT

*Miriam Belmaker and Emma Miller*

Small mammals (sometimes called micromammals), defined here as mammals of less than 5 kg live weight,[1] include members of the orders Rodentia, Eulipotyphla, Lagomorpha, Hyracoidea and Chiroptera. Small mammals have been used as palaeoecological indicators due to their rapid evolution, small home range size, unique niche requirements, and their frequent preservation in the archaeological record.[2] Small mammal distributions, abundances and community structure have been used extensively for palaeoecological reconstructions,[3] as indicators of sedentism,[4] and of urban, rural and agricultural settlement patterns.[5] In addition, commensal rodents are carriers of many zoonotic diseases, the most common of which is the bubonic plague.

In contrast to prehistoric assemblages, where fine mesh sieving is a regular practice, archaeologists excavating later historical sites do not often sieve for microvertebrates through a fine 1 mm mesh, which is needed to recover the smallest bones. Most of our information on the distribution of historic small mammals is derived from the chance find of

1 Andrews, P. *Owls, Caves and Fossils*. British Museum of Natural History (Chicago, 1990).

2 Chaline, J. Rodents, Evolution and Prehistory. *Endeavor* 1 (1977): 44–51; Cuenca-Bescós, G., Straus, L.G., Morales, M.R.G. and Pimienta, J.C.G. The Reconstruction of Past Environments Through Small Mammals: from the Mousterian to the Bronze Age in El Mir'on Cave (Cantabria, Spain). *Journal of Archaeological Science* 36/4 (2009): 947–955; Cuenca-Bescós, G., Melero-Rubio, M., Rofes, J., Martínez, I., Arsuaga, J.L., Blain, H.-A., de Castro, J.M.B. The Early–Middle Pleistocene Environmental and Climatic Change and the Human Expansion in Western Europe: A Case Study with Small Vertebrates (Gran Dolina, Atapuerca, Spain). *Journal of Human Evolution* 60/4 (2011): 481–491. Retrieved from http://eprints.ucm.es/26878/1/1-s2.0-S0047248410000655.

3 Belmaker, M. Using comparative micromammal taphonomy to test palaeoecological hypotheses: 'Ubeidiya, a Lower Pleistocene site in the Jordan Valley, Israel, as a Case Study. *Biosphere to Lithosphere: New Studies in Vertebrate Taphonomy* (2005): 110–125; Belmaker, M., Nadel, D., and Tchernov, E. Micromammal Taphonomy in the Site of Ohalo II (19 Ky., Jordan Valley). *Archaeofauna* 10 (2001). https://revistas.uam.es/archaeofauna/article/viewFile/8462/8831; Belmaker, M., Bar-Yosef, O., Belfer-Cohen, A., Meshveliani, T. and Jakeli, N. The Environment in the Caucasus in the Upper Paleolithic (Late Pleistocene): Evidence from the Small Mammals from Dzudzuana Cave, Georgia. *Quaternary International* 425 (2016): 4–15. Doi:10.1016/j.quaint.2016.06.022; Andrews, *Owls, Caves and Fossils*; Cuenca-Bescós et al., Reconstruction of past environments; Cuenca-Bescós et al., Early–Middle Pleistocene.

4 Belmaker et al., Environment in the Caucasus.

5 Weissbrod, L., Bar-Oz, G., Cucchi, T., and Finkelstein, I. The Urban Ecology of Iron Age Tel Megiddo: Using Microvertebrate Remains as Ancient Bio-Iindicators. *Journal of Archaeological Science* 40/1 (2013): 257–267. doi:10.1016/j.jas.2012.07.001; Weissbrod, L., Malkinson, D., Cucchi, T., Gadot, Y., Finkelstein, I. and Bar-Oz, G. Ancient Urban Ecology Reconstructed from Archaeozoological Remains of Small Mammals in the Near East. *PloS one* 9/3 (2014): e91795.

the larger species (e.g., the brown rat, *Rattus rattus*) which are retrieved from sieving through a larger sized sieve. Thus, we lack much information about the processes (biological, taphonomic, and anthropogenic) that affect the preservation of small vertebrates in historical archaeological sites. Often chance finds of small vertebrates is interpreted as intrusive and not indicative of human ecology in the past. In recent years, there has been a push to sample sediments from specific loci in historical archaeological sites to sieve through a fine mesh and even flotation. This has resulted in an increase in studies of small vertebrate remains, although such studies remain sporadic and are not the standard.

Proto-historic and historic anthropogenically modified habitats, such as built structures like barns, allow raptors to nest, roost and deposit pellets there. Carnivores, mostly domestic dogs and cats, consume pests and deposit scat across sites. Indeed, archaeological excavation often reveals a high concentration of small mammal remains derived from pellets.[6]

In Israel, there have been few systematic studies on small vertebrate bones in historic archaeological sites[7] and none focused on medieval periods. This chapter represents a novel study of small mammals in the fortress of Ateret (Vadum Iacob). Overlooking a critical crossing of the Jordan River, Vadum Iacob was one of the most important fortresses for the Frankish Crusaders of the late 12th century. The fortress existed for 11 months, from October 1178 when the foundations were built, until August 1179 when the Muslims captured it.[8] Sieving was utilized during the excavation, resulting in a unique assemblage of small vertebrate bones. In this study, the remains of micromammals provided information about the timeline of castle's habitation, site formation processes, and the palaeoecology of the region.

According to historical records, once the Muslim siege ended, Saladin ordered the destruction of the fortress.[9] Eight hundred bodies were thrown into the cistern, probably to contaminate the drinking water, and the Muslim force began dismantling the inner buildings of the fortress. Saladin also ordered the restoration of the sacred shrine (at the northern edge of the fortress) dedicated to the patriarch Jacob. Although Saladin did his best to destroy the fortress, the sickness that broke out among his men led to his early departure prior to the complete destruction of the fortress. Excavation of the site revealed articulated skeletons of equids and humans on the kitchen floor, under a thick layer of debris and stones of the kitchen's collapsed vault. The articulation of the skeletons suggested that they were covered quickly and not scavenged by wild animals. It was hypothesized that the vault and other nearby structures were destroyed by Saladin's forces. However, once the collapse was removed, the oven's dome could still be seen, suggesting that the oven may well have stood for a long time after the site was abandoned.

---

6 Armitage, P. L. Small Mammal Faunas in Later Medieval Towns: A Preliminary Study in British Urban Biogeography *Biologist* 32/2 (1985): 65–71; De Cupere, B., Thys, S., Van Neer, W., Ervynck, A., Corremans, M. and Waelkens, M. Eagle Owl (*Bubo bubo*) Pellets from Roman Sagalassos (SW Turkey): Distinguishing the Prey Remains from Nest and Roost Sites. *International Journal of Osteoarchaeology*19/1 (2009): 1–22.

7 Bar-Oz, G., Bouchnik, R., Weiss, E., Weissbrod, L., Bar-Yosef Mayer, D.E. and Reich, R. "Holy Garbage": A Quantitative Study of the City-Dump of Early Roman Jerusalem. *Levant* 39/1 (2007): 1–12; Fried, T., Weissbrod, L., Tepper, Y. and Bar-Oz, G. A Glimpse of an Ancient Agricultural Ecosystem Based on Remains of Micromammals in the Byzantine Negev Desert. *Royal Society Open Science* 5/1 (2018): 171528. doi:10.1098/rsos.171528; Weissbrod et al., Ancient Ecology; Weissbrod et al. Urban ecology of Iron Age.

8 See this volume, Chapter 4.

9 See this volume, Chapter 5.

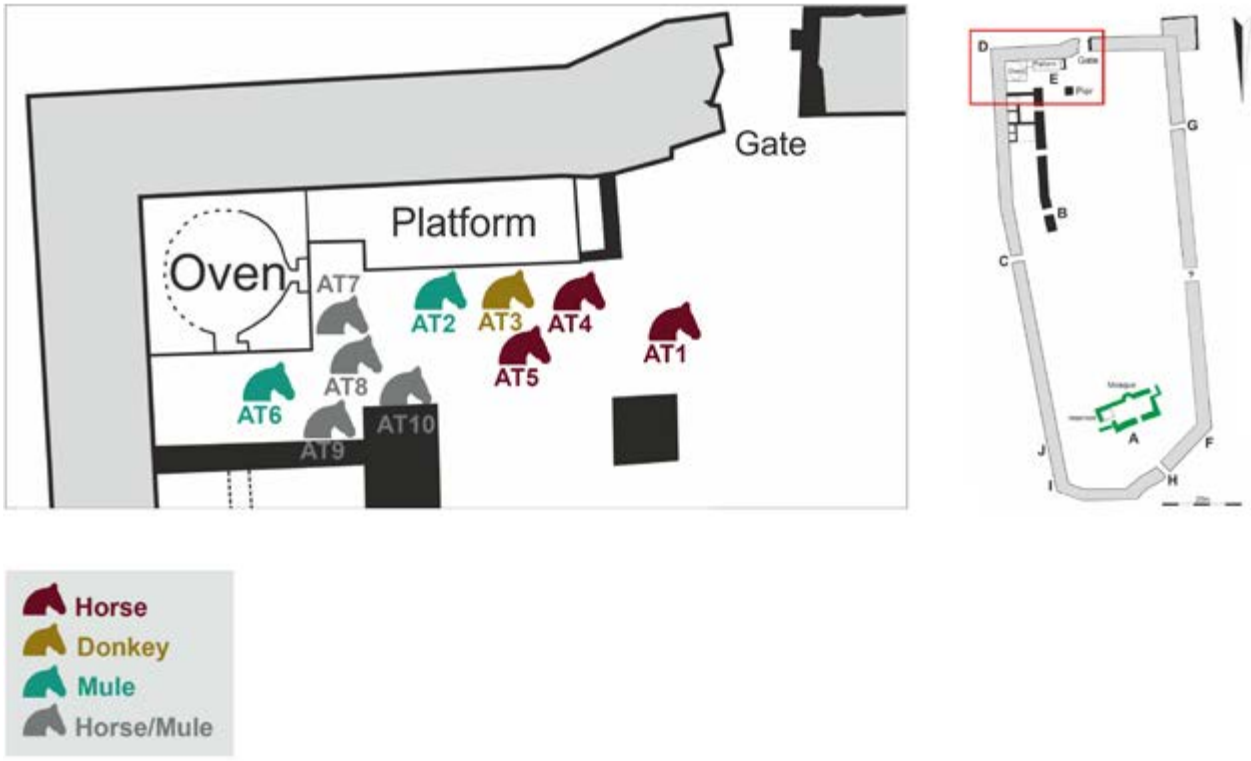



**Figure 11.1.** Area E, Locus 104, located within the red frame (drawing by Hadas Motro).

## Methods

Area E, Locus 104 was excavated in September 2005. This locus spans a vaulted area in the south-eastern corner of the fortress, adjacent to an installation identified as a domed oven (Fig. 11.1). Excavation was conducted in 1 x 1 m squares. All sediments were dry sieved and 10% of the sediments were wet sieved through a 1mm mesh.

A total of 633 fragments were analysed for this chapter. Dental remains were identified to species using the zooarchaeology and paleoecology comparative collection at the University of Tulsa. Post-cranial remains were not identified to species following common procedures, but to element only. Taphonomic parameters were noted on all the elements including fragmentations, burning and raptor digestions. To study the palaeoecology of the site, twenty samples were then sent to the University of Arkansas Stable Isotope Lab for 13C isotope analysis.

## Results

### Taxonomy

Three species were identified among the dental remains: Gunther's vole (*Microtus guentheri*), Tristram's jird (*Meriones tristrami*) and the bi-coloured, white-toothed shrew (*Crocidura leucodon*). Two quantification methods were used: Number of Identified Specimens or NISP and Minimum Number of Individual (MNI). Results indicate that the abundance distribution using both quantifications is similar, suggesting a low level of cranial fragmentation (Table 11.1).

**Table 11.1.** Three species identified by dental remains

| SPECIES | NISP | MNI |
|---|---|---|
| *Microtus guentheri* | 224 (88.88%) | 56 (86.71%) |
| *Meriones tristrami* | 22 (8.73%) | 7 (10.15%) |
| *Crocidura leucodon* | 6 (2.38%) | 2 (2.34%) |

### Taphonomy

Andrews developed a taphonomic method to distinguish between micromammal predators in archaeological sites.[10] By using a combination of body part representation, fragmentation, and digestion he showed that one can distinguish between five categories of predators. Body part representation includes all large post cranial elements. Here we did not differentiate between the species (Table 11.2).

**Table 11.2.** Micromammal body part representation

| ELEMENT | NISP | MNI | EXPECTED ABUNDANCE BASED ON MNI OF 64 | RELATIVE ABUNDANCE OF ELEMENTS |
|---|---|---|---|---|
| Pelvis | 70 | 35 | 128 | 54.69 |
| Humerus | 56 | 28 | 128 | 43.75 |
| Femur | 56 | 28 | 128 | 43.75 |
| Tibia | 67 | 34 | 128 | 52.34 |
| Mandible | 127 | 64 | 128 | 99.22 |
| Skulls | 27 | 27 | 64 | 42.19 |
| Loose molars | 98 | 9 | 768 | 12.76 |
| Ribs | 7 | 1 | 1664 | 0.42 |
| Vertebra | 38 | 2 | 1664 | 2.28 |
| Scapula | 3 | 2 | 128 | 2.34 |
| Ulna | 27 | 14 | 128 | 21.09 |
| Incisor | 57 | 15 | 256 | 22.27 |

10 Andrews, *Owls, Caves and Fossils.*

### Isotope Analysis

The bulk carbon isotopes average values of 20 *Microtus guentheri* specimens (whole tooth and skull) are 27.99±0.4267 (Table 11.3). We compared these results to those of modern *Microtus guentheri*.

**Table 11.3.** Bulk carbon stable isotope values for Ateret Microtus guentheri and two modern comparative populations.

| | Δ 13CARBON | |
|---|---|---|
| | N | VALUE |
| Ateret | 20 | -10.303±0.5584 |
| Israel Modern North (Hula) | 2 | -24.27±0.165 |
| Israel Modern South (Shoham) | 5 | -22.53±0.174 |

## Discussion

All three species that were found at the site occur naturally in the wild in Israel around the location of the Ateret fortress. Of interest is the absence of commensal species such as mice and rats. We can hypothesize that if the micromammals were remains of species that lived there when the fortress was active, it would have been dominated by species that lived off the rubbish and agricultural products kept in the fort. This hypothesis is further bolstered by the location of the majority of finds. Locus 104 was found near the oven and the threshing area. We propose that the pellets were dropped after the fort was abandoned, but not long after since the remains overlay the horse skeletons with no accumulation of soil between them. Since barn owls need a place to roost in order to deposit pellets, this supports the idea that some form of architecture was still standing post destruction.

So far, three species of micromammals have been found during the sorting process: voles (Fig. 11.2), jirds and moles. All three are likely from wild, rather than commensal, populations. This, along with a lack of mice, points to birds of prey hunting wild populations outside of the fortress. In contrast, a study of a Roman-era urban community found evidence of rats in owl pellets; rats were drawn to a domestic food source associated with a structure that was inhabited when the owl laid the pellets.[11] To reiterate, the small mammal remains at Vadum Iacob were deposited after abandonment.

**Figure 11.2.** A vole (*Microtus guentheri*) skull from the Ateret fortress exhibiting tell-tale breakage of the back of the skull by barn owls.

11 Walker, T., Sharpe, J.R. and Williams, H. Barn Owls and Black Rats from a Rural Roman Villa at Gatehampton, South Oxfordshire. *Environmental Archaeology* 26/5 (2019): 487–496.

The third line of evidence is the breakage of post crania. With the exception of the cranial breakage, typical of barn owls, the other post cranial elements were not broken. This suggest that post depositional trampling, which often occurs with pellets deposited during habitation of the site, did not occur. It is emblematic of the fact that the pellets were deposited post occupation.

Of note are several missing elements. These are all smaller elements such as the feet bones. This may be related to inexperienced sorting, which often misses manus and pes bones, and sieving through a larger size mesh — even a 1 mm mesh can fail to capture these tiny elements.

From a palaeoecological perspective, all three species are living in the region today, so so species distribution cannot be used for paleoecological reconstruction. However, the isotope results (Table 11.3) show a marked difference from Hula valley voles, with a positive shift of δ13C values indicating a pronounced dietary shift among voles in the 12th century compared to those today. While these are only preliminary results and have not been fully analysed, they point to a much higher C4 component in the diet compared to modern populations. This is consistent with the historical evidence of a long drought during this period.

> *"This year (1178–9) the rains failed completely in all the lands of Syria, the Jezīra, Iraq, Diyār Bakr, Mosul and the Uplands, Khilāṭ and elsewhere. Famine became severe and widespread in all the lands. A ghirāra of wheat[12] which is twelve makkūks in Mosul measures, was sold in Damascus for twenty old Tyrian dinars. In Mosul barley cost one Amīrī dinar for every three makkūks. In all other lands prices were comparable. The people in all regions of the land prayed for rain but their prayers were not granted. Food became short and people ate carrion and similar things. This situation lasted until the end of 575 (May 1180), but it was followed by severe sickness, also widespread."*[13]

## Conclusion

This is the first time micromammals have been used in the analysis of a Crusader site in Israel. The taphonomy of the remains has provided insight into the timeline of habitation. The lack of breakage, besides those attributed to predators, suggests the absence of humans, as they would have trampled the remains. We can look also at the species found during the sorting process: only wild voles, jirds and moles have been found so far, meaning that raptors hunted these micromammals after humans abandoned the site. The presence of mice or rats would suggest cohabitation with humans. Taphonomy and species speak to the timeline of the fortress, while isotope analysis provides insight into the regional ecology. The remains of micromammals originating in owl pellets has provided information about the destruction and abandonment of the Crusader castle, adding an intriguing facet to the end of its story.

---

12 Literally, a 'sack' of wheat, a little over 200 kg. Hinz. W. *Islamische Masse und Gewichte: Umgerechnet ins Metrische System* (Leiden, 1970), 37–38.

13 Ibn al-Athīr, *The Chronicle of Ibn al- Athīr for the Crusading Period from Al-Kāmil fi'l-Ta'rīkh*. Tran. D. S. Richards, (Aldershot, Hampshire, U.K., 2007), vol. 2, 261–262.

CHAPTER 12

# IRON WORKING TOOLS AND OTHER METAL FINDS

Most of the tools and other metal finds in this catalogue are made of iron. They are badly corroded and poorly preserved, due to the high precipitation and humidity of the region. If the composition of a non-ferrous tool or other metal find is known for a particular object, it is noted in the relevant catalogue entry.

Not all the tools are drawn or photographed. The identification given in parentheses for each catalogued item begins with a capital letter that identifies the excavation area where the item was found; the three digit number represents the locus, and the four digit number represents the basket (for example, Catalogue Number 1 is from Area C, Locus 572, Basket 5610/1). Measurements are given in centimetres: l. = length, w. = width, th. = thickness, d. = diameter. Weights are given in kilograms. The find locations for all the catalogued metal objects in this chapter are presented in Table 12.1 at the end of the chapter.[1]

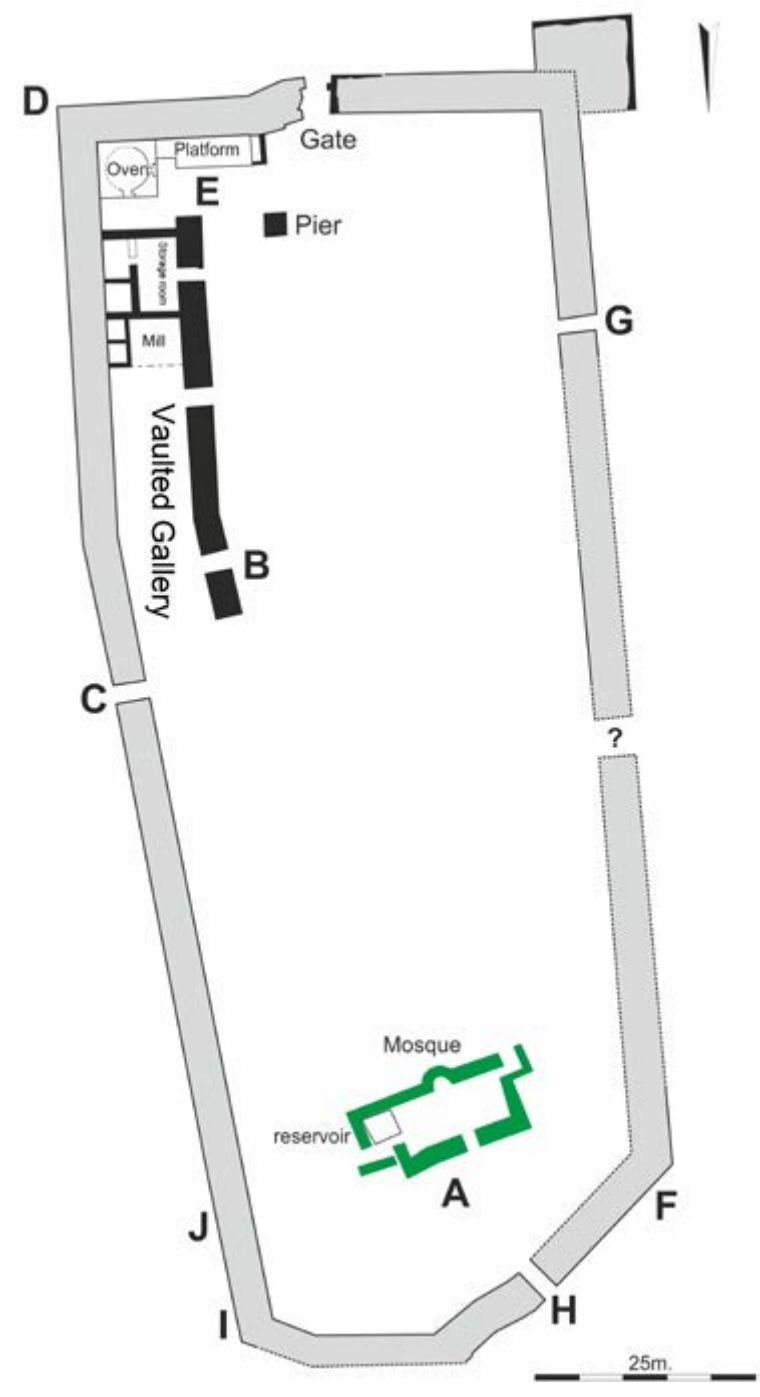
## Craftsmen and their tools

By the end of the excavation season in the summer of 1994, a fascinating collection of workmen's tools had been uncovered. They were revealed in various locations within the fortress walls and in the quarry (Fig. 12.1) and give us the location of work being carried out at the time of Saladin's attack.

The tools can be divided into three main categories: tools that were used in the construction of the fortress (Nos. 1–6), carpentry tools (Nos. 7–15) and masonry tools (Nos. 16–20). Many of the iron tools and the contexts in which they were found are mentioned in Chapter 4. Four hoes (Nos. 1–3, 5) were found close to the eastern postern, in a pile of mortar that was being mixed for packing the core of the curtain wall. The area near the heap of lime and the heap itself contained tens of arrowheads, which were no doubt aimed at the group of workers that were caught by surprise when the Muslim attack began (see Chapter 5). Wood samples were taken from the sockets of three iron tools (Nos. 7, 9 and 11); identification of the wood and its analysis was done by Professor Nili Liphschitz (see the relevant catalogue entries and Chapter 15).[2] The only tool that may have belonged to a blacksmith is a large, heavy hammer (No. 11). Two trowels

1 For a more detailed study on the metal finds from Jacob's Ford see: Gosker, J. *Metal Artifacts of the Crusader Kingdom of Jerusalem: Case Studies of the Cultural Exchange between East and West*. PhD thesis. Haifa University (2021).

2 Professor Nili Liphschitz was one of the leading archaeobotanists in Israel. It was always a pleasure to bring samples to her laboratory at Tel Aviv University, which led to illuminating conversations. Sadly, Professor Liphschitz passed away in August 2019.



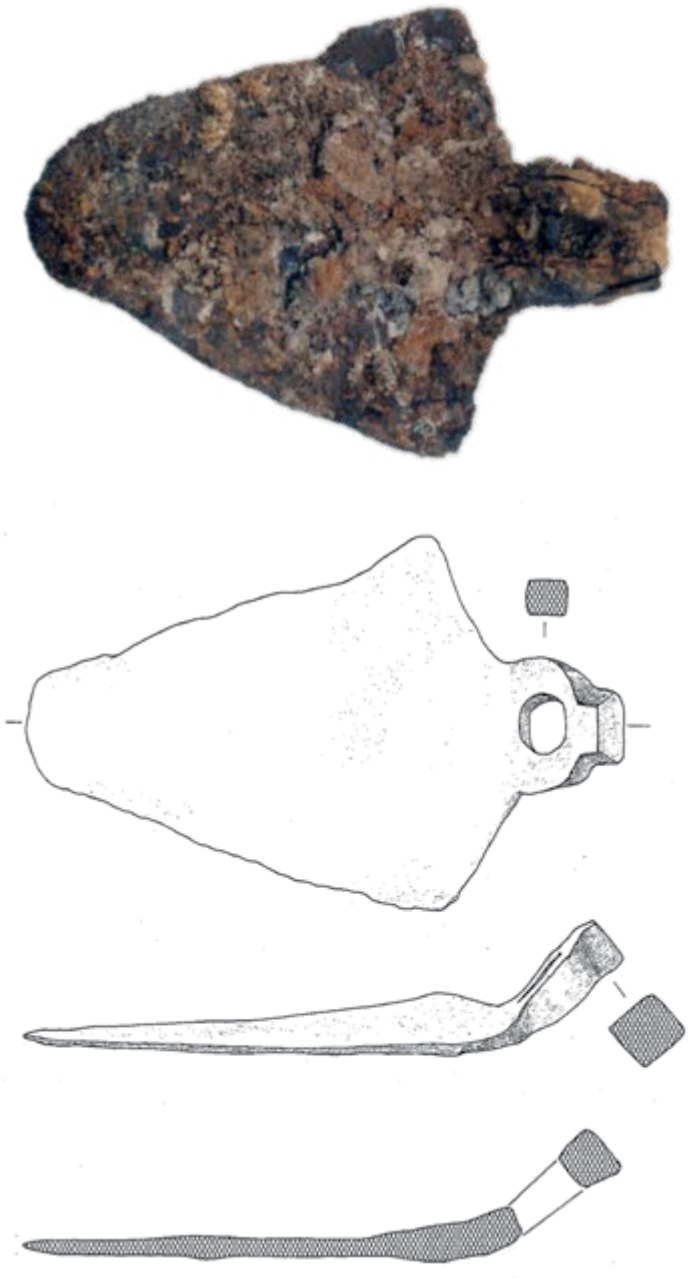

(Nos. 13–14) and the hammer were found in a layer of ash north of the main gate.

Abū Shāma, who was an eyewitness to the battle, gives a list of craftsmen who participated in the building of the fortress: masons, blacksmiths, and carpenters.[3] His list correlates with some of the tools that were found.

**Figure 12.1.** Plan of the fortress. Capital letters refer to the excavation areas.

3 Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl. *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3: 37. See chapter 5.

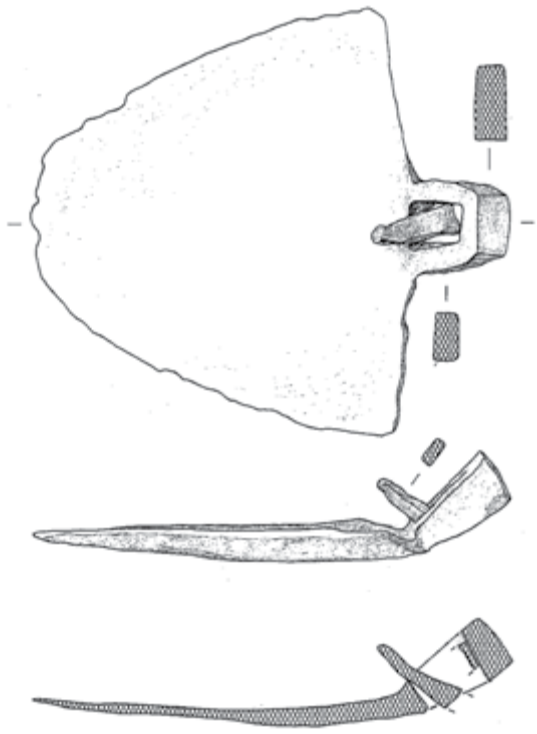
# The Catalogue



4

**Tools used in the construction of the fortress**

1. Hoe (C.572.5610/1). Triangular shape. The handle base is rectangular.l. 23, w. 24.5, th. 0.7 (not illustrated).
2. Hoe (C.572.5610). Triangular shape. The handle base has a ring-shaped design.l. 29, w. 23.5, th. 0.5 (not illustrated).
3. Hoe (C.572.5585). Triangular shape with rounded edge.l. 26.5, w. 21, th. 0.5 (not illustrated).
4. Hoe (G.213.2205). Triangular shape. The handle base is placed at an angle to the tool body. The socket is rectangular in shape. Inside the socket there is a small peg to add strength and stability to the handle.l. 23.5, w. 22.5, th. 0.5.

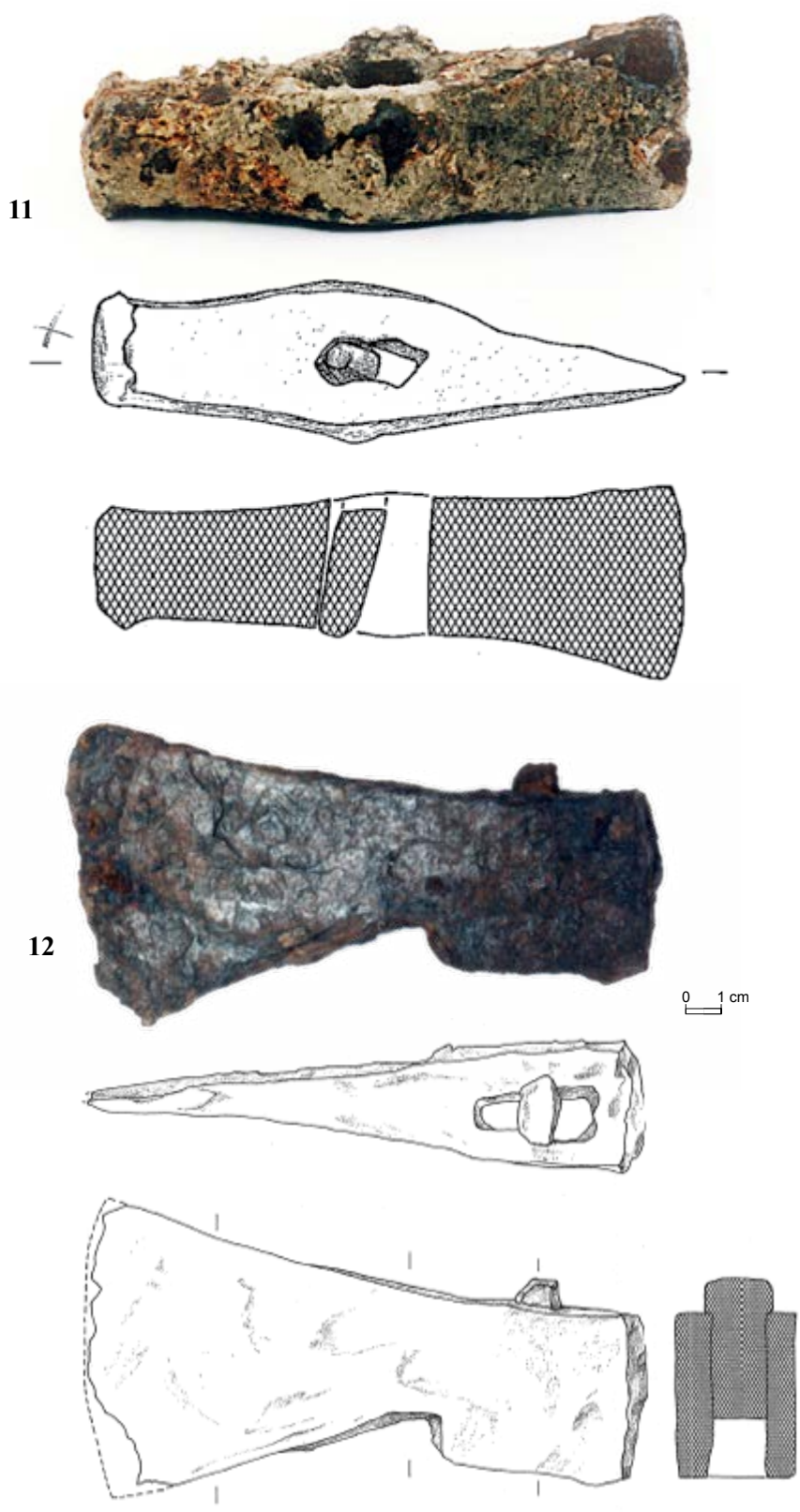

5. Hoe (C.572.5591). Triangular shape with rounded edges.l. 23.5, w. 25.5.
6. Spade (C.572.5597). Rectangular shape with rounded edges.l. 38, w. 21.

**Carpentry tools**

As expected from a site in the process of construction, hundreds of iron nails were found (see below), that may have belonged to wooden scaffolding, the fortress gates, temporary lodgings, animal pens, and furniture. It is quite possible that some of the wood was locally sourced, from the northern part of the Hula valley. The carpentry tools are represented by four adzes (Nos. 7–10) that were used for crude woodwork, but could also be used for digging, a hammer (No. 11), an axe (No. 12), trowels (Nos. 13–14) and a pick (No. 15).

7. Adze (C.572.5608). Arched back, fan-shaped blade.l. 27, w. 6–6.5, th. 0.2–4.5 (not illustrated). The wood sample taken from within the socket revealed that the handle was made from coniferous wood, possibly Lebanese cedar, which belongs to the pine family.
8. Adze (C.578.5574). Arched back, broken fan-shaped blade.l. 25, w. 7, th. 0.5.
9. Adze (C.572.5602). Edge broken and eroded.l. 25, w. 7.2, th. 0.5 (not illustrated). The charred wood sample taken from within the socket revealed that the handle was made of oak, probably Tabor oak (*Quercus ithaburensis*), remains of which were found at the site. The Tabor oak can be found in the Hula Valley and its surroundings, and further north; its trees are especially known at Horshat Tal.

**8**



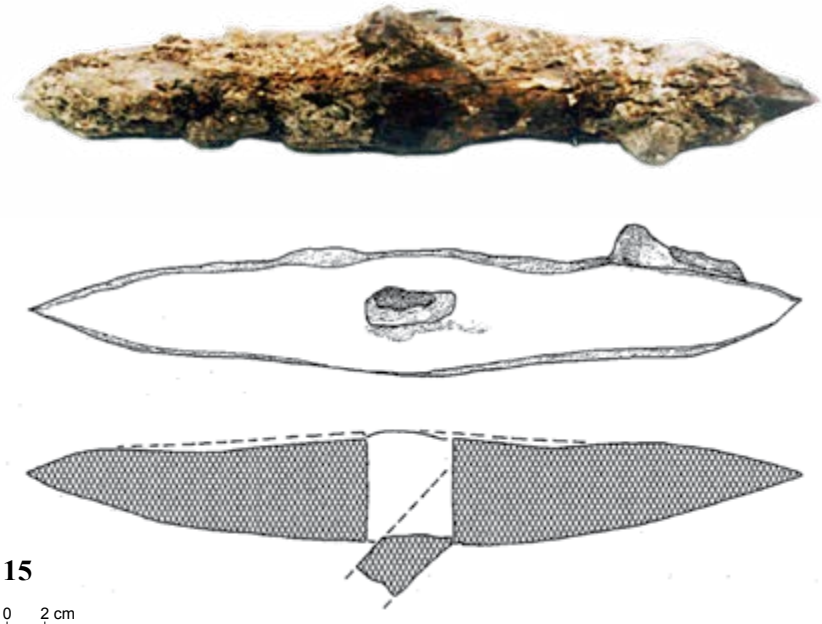

10. Adze (E.873.8579). l. 22.5, w. 5–9, th. 0.4–2.5 (not illustrated).
11. Hammer (E.873.8570). One of its edges is square and curved, the other has a straight blade. Charred remains of wood are still visible in the center of the handle socket. Like No. 9 above, testing revealed that the handle was made of oak, probably Tabor oak. The curved head and straight wide blade gives this tool the qualities required of a blacksmith's hammer.l. 20, w. 4.7–7.[4]
12. Axe (C.572.5602). l. 17, w. 9.5, th. 0.5–2.8.

4 Bealer, A. W. *The Art of Blacksmithing* (New Jersey, 1995), 343, 351.

**Nos. 13 and 14**

0 2 cm

13. Trowel (E.873.8570). Flat and diamond-shaped, attached to a long handle.l. 16, w.7, th. 0.3 (bottom photo).
14. Trowel (E.873.8570/1). Identical in shape to the previous trowel; differs only in its dimensions.l. 13, w. 8, th. 0.4 (top photo).
15. Pick (C.572.551/2). l.38, w. 5, th. 6.



**15**

0 2 cm

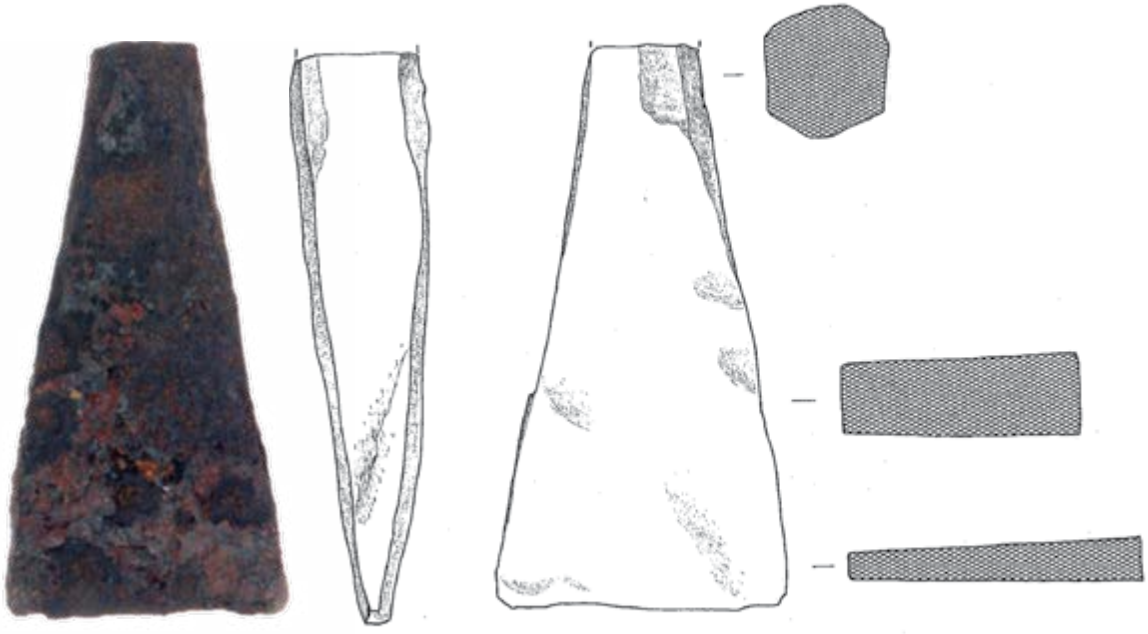
16

17

18

0 1 cm

19



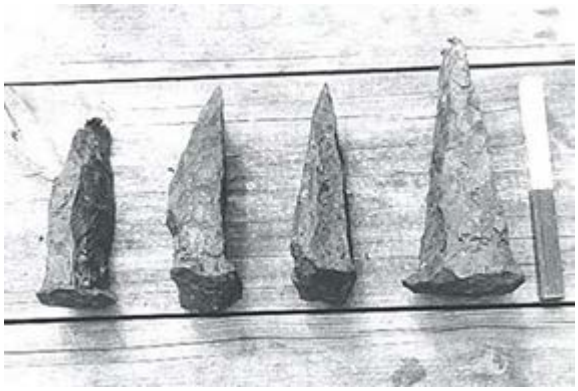
## Masonry tools

Masonry tools were found at the fortress and in the quarry; including three chisels (Nos. 16–17, 19) and five wedges (Nos. 18, 20a-20d).[5] The four large wedges found in the quarry (Nos. 20a-20d) were used for hewing and dislodging stones from the bedrock.

Two chisels and a wedge (Nos. 17–19) were found outside the fortress, while excavating the foundations of the southeast corner (Area D).

16. Chisel (A.251.2504). l. 8.7, w. 1.8, th. 1.4.
17. Chisel (D.704.7004).
18. Wedge (D.704.7031). Trapezoid shape. Wide, fan-like blade. Rectangular head, broad and flat.l. 17, w. 6–8.5, th. 2.7–0.5. It almost certainly functioned as a stone-working tool.
19. Chisel (D.704.7004). l. 13, w. 2.5–7, th. 0.5–2.5.

5 The heavy wedges that came from the quarry, located 1.5 km west of the fortress, were found during an archaeological survey conducted by Yosef Stepansky.



**20a–d**

20a–d. Wedges from the quarry (from right to left). Trapezoid in shape, with fan-shaped blades. The tools are roughly made, although their shapes could have been damaged and warped by hammer blows and quarry work.

20a.l. 22.5, oval head l. 11, d. 9, th. 6.3.

20b.l. 19, w. 8, th. 4.

20c.l. 18, w. 8, th. 3.8. rectangular head l, 5~5, w. 5.

20d.l. 15.5, w. 6.2, th. 2.5.

**Other metal finds**

A variety of other metal objects were found within and just outside the fortress, as well as in the quarry. The finds include agricultural tools (Nos. 21–22), scissors, blades and bands (Nos. 23–31), nails (Nos. 32–39), horse, mule and donkey shoes (Nos. 40–43), hooks and rings (Nos. 44–48), buckles (Nos. 49–55), jewelry (No. 56) and bullets (No. 57). While some may date to the construction and siege of the fortress, others date to later periods (see Chapter 13 for metal finds from the Mamluk hamlet).

**Agricultural tools**

**21a-b**

0 2 cm

21a. Sickle, top photo (E.873.8570). l. 44.5, w. 3, th. 0.5. From the Crusader level.

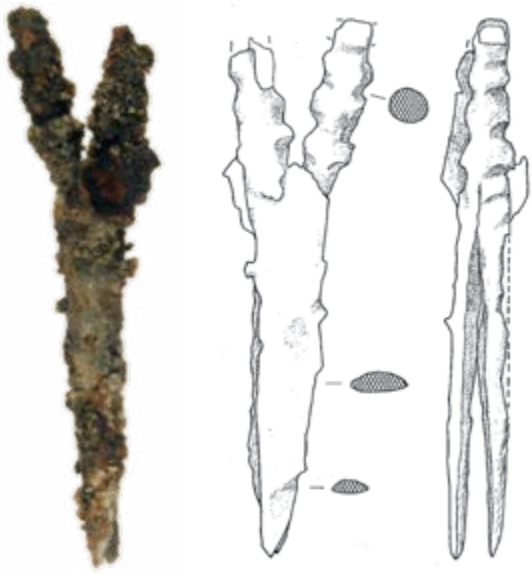
21b. Sickle, bottom photo (B.371.3571), point missing.l. 40.5, w.3.5, th.0.2. This sickle is from the Mamluk hamlet (see Chapter 13).

**22**

22. Hatchet (K.725.7063) l. 20.5, w. 4.5, th. 0.7. The blade is long and straight.

Designed for beating down thorn bushes such as raspberry, clearing woodlands or pruning orchard trees. Sometimes mounted on a long wooden pole.[6]

6 Avitzur, S. *Man and His Work: Historical Atlas of Tools and Workshops in the Land of Israel* (Jerusalem, 1976): 154 (Hebrew).

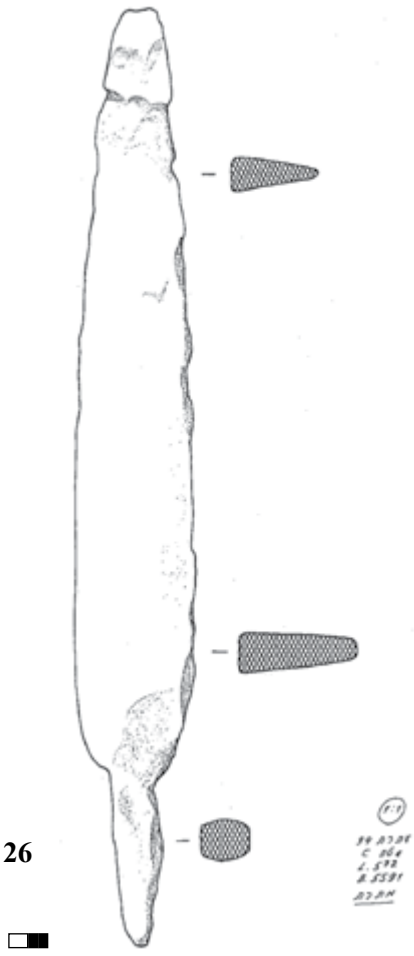


23

**Scissors and Blades**

23. Scissors (C.550.5591) l. 15.5, blade w. 1.5.
24. Knife (E.907.9017). l. 12, w.1.8, th. 0.3. The back is straight, while the blade is narrow and arched.
25. Knife (E.923.9045). l. 13.5, w. 2.2, th. 0.5. Elongated and narrow leaf-like shape. The point is missing, serrations and cracks run along the knife's edge.
26. Knife (C.572.5591). l. 22. The handle base is 4.5 cm long, th. 0.8.

24 25



26

27
0 2 cm

Symmetrical blade, with an elongated and narrow leaf-like shape.

27. Knife (K.729.7060). l. 18.6, w. 2.3, th. 0.3.

28. Knife/dagger (B.313.3067). l. 34, w. 3.5, th. 0.5.

The dagger's back is arched. The blade is straight, cracked all along its length and broken in the middle. Three rivets that held the wooden handle in place remain along the handle base.

**Metal bands**

29. Wheel rims or barrel supports (C.572.5591).

29a.l.39, w. 3.5, t. 1.4, weight 1.572 kg

28
0 1 cm

29
0 2 cm

29b.l. 41.5, w. 2.5, t. 0.8, weight 1.653 kg.

30. Metal band with nails) C.572.5608). l. 92, w. 3.5, th. 1.The strips are bent, cracked, broken, badly corroded, covered by a thick layer of lime and encrustation and studded along its entire length with nails at regular intervals of 8–9 cm.

30

**Nails**

31. Nail (C.569.5539). l. 8.5, head d. 2.2, th. 0.6.

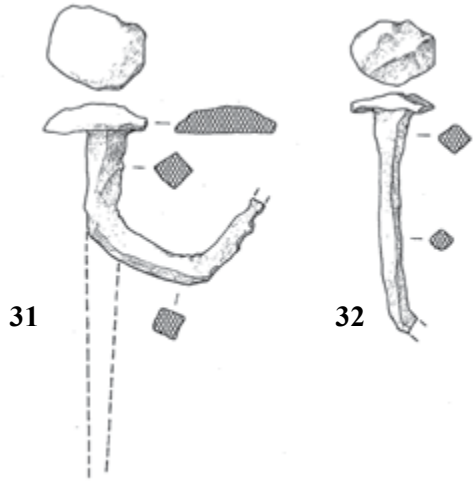
32. Nail (C.578.5574). l. 6.5.

33. Nail (E.870.8561). l. 7.

34. Nail (A.154.1519). L. 7.5.

35. Nail (B.373.3578). l. 3.5.

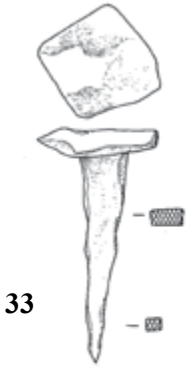
36a (left) and 36b (right). Horse-shoe nail (from the quarry). The head is rectangular.



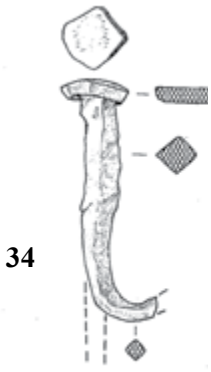
31



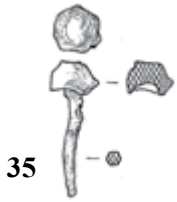
32



33



34



35

36

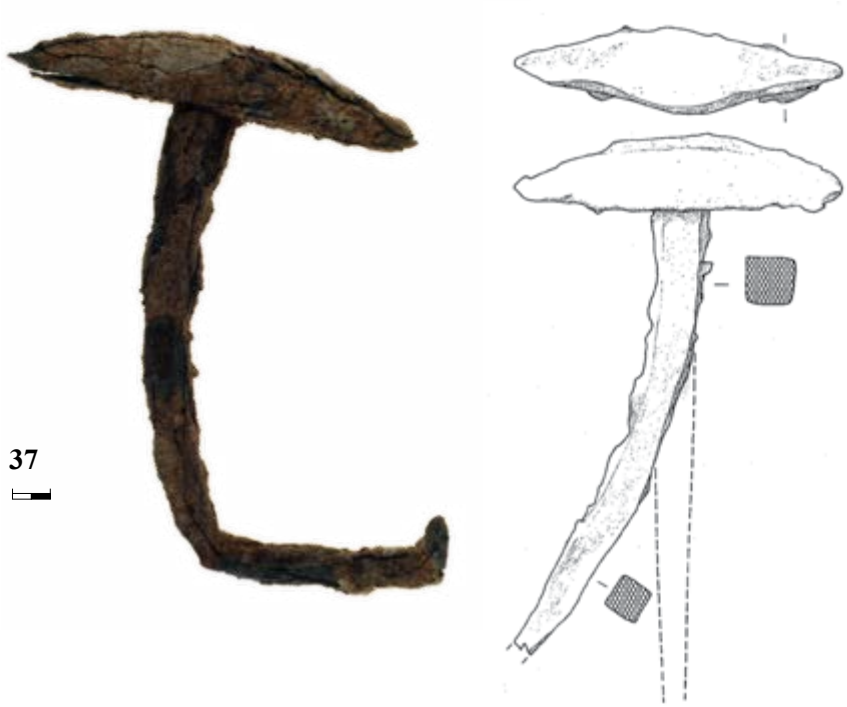
**Scale 1:2**

**Hammer-shaped pegs**

37a (G.230.2304, photo) l. 13.5, th. 1.2, w. of head: 10.

37b (C.564.5529, drawing). l. 13.2, th. 1.4, w. of head: 102.

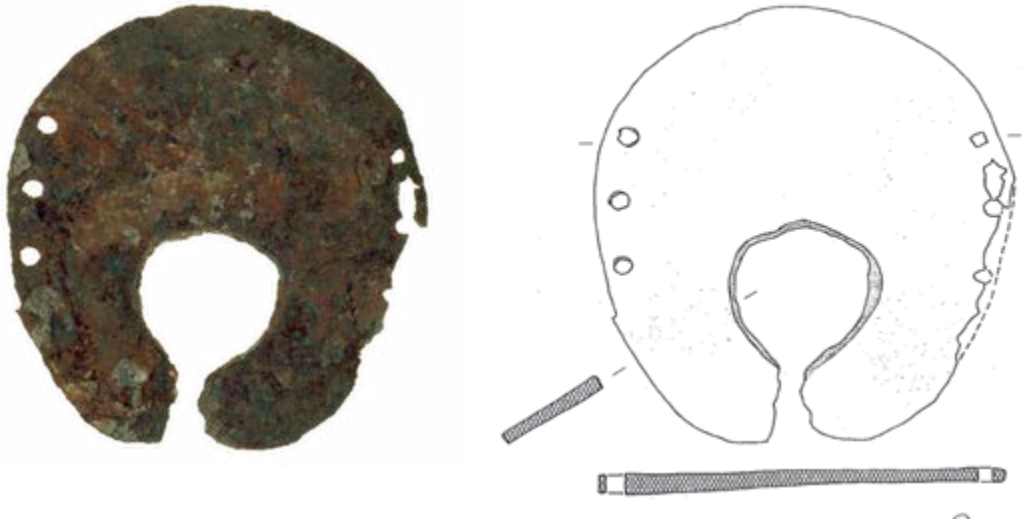
They may have been used in the construction of gates to fasten wooden beams, whose thicknesses ranged between 15–20 cm. Four of those odd looking nails were found.



37

**Horse, mule and donkey shoes**

38. Closed horseshoe. l. 11.5, w. 10.8, th. 0.5, w. 2.5–6. Found near the quarry opposite the fortress. Unlike the horseshoes below (Nos. 41–43), this one resembles an eastern-type full horseshoe. The gap between the edges of the horseshoe is about 1 cm and there is a 4 cm hole in its centre.



38

39. Horseshoe (A.108.1037) l. 7, w. 6, th. 0.2 (left).
40. Horseshoe (B.365.3557) l. 8, w. 7, th. 0.4. Open-ended type (centre).
41. Horseshoe (H.401.4001) l. 6.5. Open-ended type. Possibly an ox horseshoe (right).[7]

**39-41**

**Hooks and rings**

Iron hooks and rings were part of a range of equipment used for a variety of functions, included but limited to: harnesses, iron bands used to tether animals and hooks for hanging oil-lamps.

42. Iron fastening ring (Area E) d. 9, th. 1.5.
43. Iron ring (C. 515.5084) d. 2, th. 0.4 (not illustrated).
44. Oval ring (H. 406. 4009). l. 7, w. 4.5, th. 0.5 (not illustrated).
45. Hook (G.230.2304) l. 6.5.

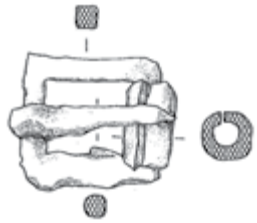
**42**

**45**

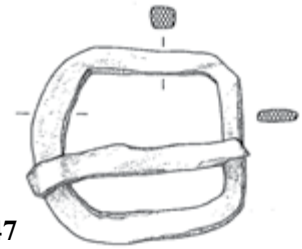
7 Avitzur, *Man and His Work*, 105.

**Buckles**

46. Iron harness buckle (E.873.8570). l. 4.5, w. 3.5.
47. Iron buckle (A.155). l. 5.5, w. 5.
48. Buckle (D.704.7033). l. 7.5, th. 0.5. Originally part of a harness buckle.
49. Buckle tongue (from the quarry). l. 5, th. 0.2.
50. Iron buckle (K.711.7026). l. 2.4, w. 2.4.

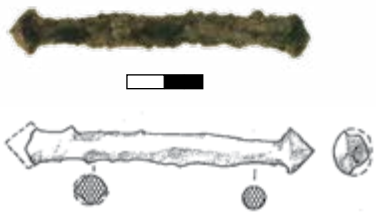


46



47

48



49

50

**Clover-shaped objects**

These possibly served as buckles, but their precise function is unclear.

51a-b(C.572.5610, left and right). Identical measurements. l 12, 1.3.

51c (G. 228.2258, center). l.9, th. 1.3.

51 a-c

**Bucket handles**

52. Bucket handles (E.104.1199) l.18, th. 1.4.

Found below a pile of equid bones in the northwest corner of the kitchen.

52

**Jewellery**

Although men also adorn themselves with rings, the only piece of jewellery found in the Crusader level was a ring that is rather delicate and feminine in design. It was revealed below some equid skeletons in the northwest corner of the kitchen. The few pieces of jewellery that date to the Mamluk hamlet are discussed in Chapter 13. None of the human skeletons found throughout the fortress was that of a woman; it seems the fortress was truly populated only by men. The ring is thus a somewhat unusual object, with a story that one can only imagine.

53. Ring (E.104.1199). d. 1.6. Copper alloy ring mounted with a glass bead coated with a fine silver patina.

53

**Table 12.1.** Find locations of items listed in the metal catalogue.

| AREA | LOCUS | CAT. NUMBER | DESCRIPTION |
|---|---|---|---|
| A (1993) | 108 | 39 — horseshoe | Fill below the western wall of the mosque |
| A (1194) | 154 | 34 — nail | Fill below floor in the eastern half of the mosque |
| A (1194) | 155 | 47 — Buckle buckle | Fill above floor in the eastern half of the mosque |
| A (1996) | 251 | 16 — chisel | Fill soil and fragments of plaster in the western half of the mosque |
| B (1994) | 365 | 40 — horseshoe | Baulk removal |
| B (1994) | 371 | 21a — sickle | Cleaning section in the most northern entrance into the barrel vault |
| B (1994) | 373 | 35 — nail | Fill in the most northern entrance into the barrel vault along W30. Above floor (?) |
| C (1994) | 515 | 43 — iron ring | Description missing |
| C (1994) | 550 | 23 — scissors | Burnt layer east of the eastern postern, outside the fortress |
| C (1994) | 564 | 37b — Hammer-shaped pegs | Burnt layer east of the eastern postern |
| C (1994) | 569 | 31 — nail | Fill on the slope outside the eastern postern |
| C (1994) | 572 | 1–3, 5 — hoe<br>6 — spade<br>7, 9 — adze<br>12 — axe<br>15 — pick,<br>26 — knife<br>29–29a- wheel rim or barrel support<br>30 — metal band<br>51a — clover-shaped objects | Pile of lime that was mixed during the siege, west of the eastern postern |
| C (1994) | 578 | 8 — adze<br>32 — nail<br>35 — nail | Fill west of the semi-circular wall (W51) |
| D (1993) | 704 | 17 — chisel<br>18 — wedge<br>19 — chisel<br>48 — buckle | Fill in the south of the southeast corner outside the fortress |
| E (1994) | 870 | 33 — nail | Layer of collapsed stones |
| E (1994) | 873 | 10 — adze<br>11 — hammer<br>13–14 trowel<br>21 — sickle<br>46 — buckle | Layer of stones, soil and ash |
| E (1997) | 907 | 24 — knife | Top soil above the eastern half of the oven's dome |
| E (1997) | 923 | 26 — knife | Top soil between the oven and W22 |
| E (2005) | 104 | 52 — bucket handles | South of the edge of W30 kitchen area (where the equid bones were excavated by Hadas Motro) |

| AREA | LOCUS | CAT. NUMBER | DESCRIPTION |
|---|---|---|---|
| G (1994) | 213 | 4 — hoe | Collapse of the upper courses of the fortress wall, into the western postern |
| G (1994) | 228 | 51c — Clover-shaped objects | Western postern |
| G (1994) | 230 | 37a — nail<br>45 — hook | Fill outside the fortress, west of the western postern |
| H (1994) | 401 | 41 — horseshoe | Topsoil west of W40 |
| H (1994) | 406 | 44 — oval ring | Fill north of W40 |
| K (1995) | 711 | 50 — buckle | Fill south of W79 |
| K (1995) | 725 | 22 — hatchet | Fill below the entrance into the barrel vault |
| K (1995) | 729 | 28 — knife | Fill ash and collapsed stones |
| Quarry | None | 20a-d — wedges<br>36a-b — nails<br>38 — horseshoe 49 — buckle tang | Outside the fortress |

CHAPTER 13

# METAL FINDS FROM THE MAMLUK HAMLET

The metal finds in this catalogue come from remnants of Mamluk dwellings in area B, C, G, E, K and area A, near the mosque. The finds include, one agriculture tool and a number of horse shoes. A few cosmetic utensils, buckles and a few pieces of simple jewelry. The collection as a whole is representative of a small, relatively poor, rural community.

The identification given in parentheses for each catalogued item begins with a capital letter that identifies the Area within the excavation where the item was found, a three digit number that represents the locus, and a four digit number that represents the basket (for example: Catalogue number 1 is from Area B; Locus 371; Basket 3571). The measurements are given in cm. l = length, w = width, th = thickness.

## Agriculture tolls and implements

The agricultural objects include a sickle (No.1), scissors (No. 2), knife blade (No. 3) horseshoes (Nos. 4–5), hook and buckle (Nos. 6–7).

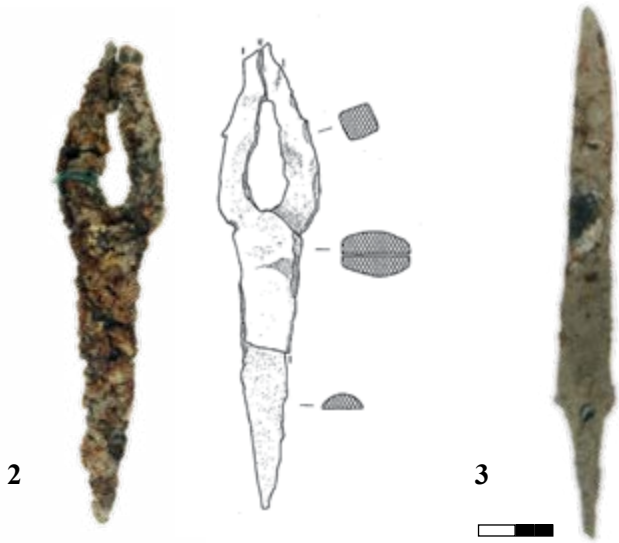
**Sickle**

1. Sickle (B.371.3571), point missing.l. 40.5, w. 3.5, th. 0.2 (the bottom item in photo; the top item, a corroded sickle, was found in the Crusader level).

**Scissors and blades**

2. Scissors (B.371.3571). badly corroded. l 13, w of blade 1.2.
3. Knife (E.468.4540). l. 15, w. 1.5, th. 0.3.

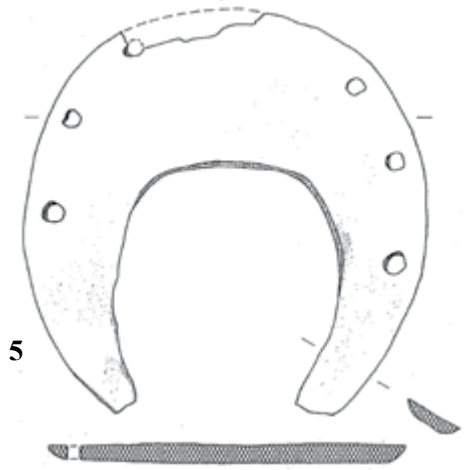
The back is straight, while the blade is narrow and arched.




**Horseshoes**

4. Horseshoe (B.302.3003). l. 11.5, w. 1.5–4.5. The shoe is round and open. Three round holes pierce the length of each side. The inner side of the horseshoe is hook-shaped.

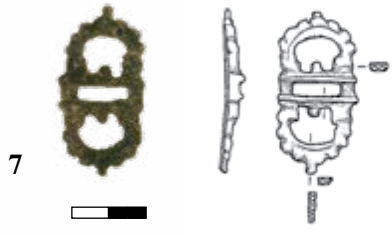

5. Horseshoe (B.307.3017). l. 10.4, w. 10.7, th. 1.8–4.8.




**Hook and buckle**

6. Hook (B.307.3032). l. 6.5, th. 0.9.


7. Bronze buckle (B.373.3574). l. 4.3, w. 2.



## Jewelry and cosmetic implements

The objects of personal adornment include jewelry (Nos. 8–15), pins (Nos. 16–17) and cosmetic utensils (Nos. 18–19).

### Jewelry

Most of the jewelry and the two cosmetic utensils are made from copper alloys and come from the Mamluk levels. Simple rings and bracelets can be found in most archaeological sites, both urban and rural, throughout the country.

8. Bronze bracelet (A.112.1042). d. 5, th. 06.

**8**

9. Bracelet fragment (C. locus and basket are missing). l. 8.5, w. 1, th. 0.2. Decorated with a braided design.

**9**

10. Earring (A. locus no. missing.1005). d. 1.8. Made of two copper alloy bands. Four turquoise and reddish-brown beads are threaded through the small band.

**10**

11. Earring (G.212.2190). d.1.5. A plain copper alloy thread with a bead.

**11**

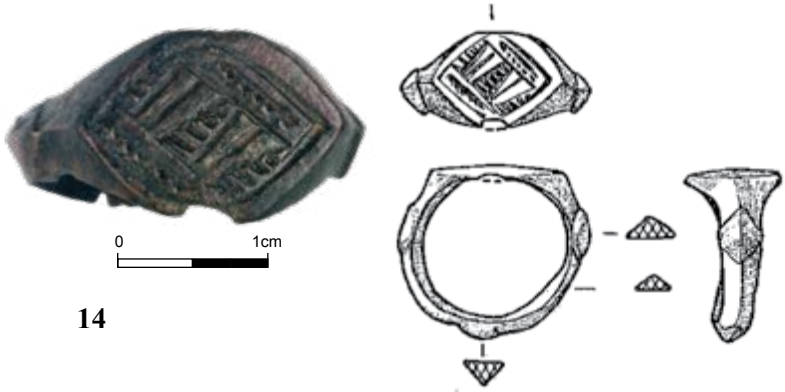
12. Heart-shaped copper alloy earring (C.569.5601). l. 3, w. 1.

**12**

13. Ring (G.205.2113). d.1.7, w. 0.3, th. 0,2. The ring's face is oval-shaped. Decorated with two parallel engraved lines, flanked on both sides by braided designs, the entire pattern enclosed in an oval frame.


**13**

14. Ring (E.468.4539). d. 2, w. 0.5, th. 0.3. The ring's face is decorated with engraved stripes and lines arranged inside a rectangle flanked by wavy lines on both sides. The band has a triangular cross-section, decorated with three diamond shapes.




**14**

15. Ring (K.731.7071). d. 1.6.
Small copper alloy ring with a diamond shaped incision.

**15**

**Pins**

16. Pin (A.150.15018). l. 8, th. 0.3. Copper alloy.

17. Pin (B.373). l. 5.4, t. 0.1. Used as a hair pin or to fasten an item of clothing (not illustrated).


**16**

## Cosmetic tools

18. Cosmetic stick (B.306.3014), used for applying kohl.l. 9.7, th. 0.2. The spoon The stick ends in a tiny spoon.

**18**

19. Spoon (C.578.5574). copper alloy.l. 13.5.

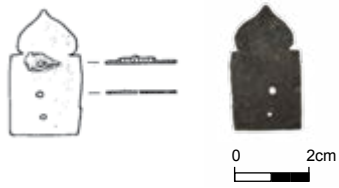

**19**

## Miscellaneous objects

20. Bell (A.208.2101). l.5, w. 3.4. Copper alloy. Pear-shaped.

**20**

22. Scale or clasp? (B.373.3574), copper alloy l. 2.8, w. 1.4




**22**

21. Ottoman lead rifle bullets, found in Area A (locus and basket missing)

**21**

CHAPTER 14

# THE POTTERY FROM THE TEMPLAR FORTRESS AND THE MAMLUK HAMLET

*Yael D. Arnon*

The excavations of the Crusader castle of Vadum Iacob yielded a large amount of pottery, both fragmentary and intact, dating from the Iron Age to the modern era. This report focuses exclusively on the medieval material and does not deal with the early or later periods.[1]

Given the known historical context and clear stratigraphy of Vadum Iacob, sealed loci were selected for analysis, which represent the period of the fortress' construction. The pottery types in these contexts date to the late 12th, 13th and 14th centuries CE.

Over 3000 shards were identified and analysed. The material was first studied typologically. The vessels were classed as tableware, basins, cooking ware and containers, as well as a few miscellaneous and Ottoman wares. Within those categories, the pottery was subdivided into open and closed vessels, by size from small to large vessels, and by decoration as unglazed and glazed vessels. In addition, the types were quantified to illustrate the functional nature of the assemblage (Fig.14.1). The oil lamps were studied separately as is customary in archaeological reports of the classical and medieval periods. Following this, the assemblage was analysed according to the stratigraphic sequence and the types were dated according to the historical documentation available. The Munsell Soil Colour Charts (1990, hereafter MSCC) were used to define the clay's hue.[2]

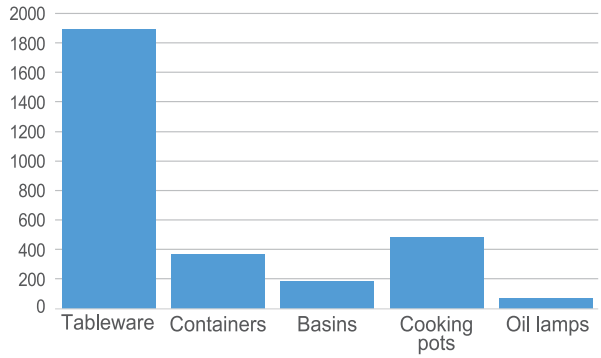



**Figure 14.1.** The distribution of pottery classes at Vadum Iacob.

1 For the Hellenistic-period pottery, see Sabar, R. The Galilee during the Hellenistic Period (4th — 1st c. BCE): Geopolitical Changes in Light of the Settlement History and the Fortified Sites. PhD thesis, The Hebrew University of Jerusalem (2023).

2 In several cases, areas, loci or basket numbers are missing and we could not relocate them. Thus a question mark was inserted.

# Typological Analysis

## Table Ware

### 1A. Unglazed Wares

*1Aa. Handmade bowls* (Fig. 14.2:1–9).

The bowls of this group, with or without painted decorations, are mainly characterized by their production technique. All of them are handmade using a mould (possibly another bowl) covered with a cloth (see also handmade red painted jugs below). The clay is usually light brown, coarse and contains white grits of various sizes, as well as organic and quartz inclusions. Some are covered with painted decorations that were applied on a slip to provide a better background for the red/brown geometric patterns. Bowls with no decoration are usually red slipped and burnished (Fig. 14.2.8).

Hand-made bowls are well known from Hama and Tel ʻArqa in Syria; Yoqneʻam, Mount Carmel, ʻAtlit, Burj al-Ahmar, Moẓa and Jerusalem in Israel; and Pella in Transjordan (Poulsen 1957: 270–74; Thalmann 1978: Fig. 31.1; Avissar 1996: 132, Fig. XIII.87, Type 34; Pringle 1984: Figs. 4.21–22; Pringle 1986: 140–142; Dolinka 2018: Fig. 2; Johns 1936: 54; Tushingham 1985: Fig. 45.13 and Smith 1973: 239–242, Group D). Although they appear in the last Crusader phase (Stratum IIIa) in Yoqne'am and in the Ayyubid occupation levels (early 13th century) in Jerusalem, handmade bowls with and without painted decorations flourished during the Mamluk period. One bowl from Ateret (Fig. 14.2:8) has a parallel from Khirbat Burin (Kletter and Stern 2006: 12: 2); a second bowl (Fig. 14.2:9) also has a parallel from Khirbat Burin (2006: 14: 1); both are dated there to the Mamluk period.

*1Ab. Handmade Jugs and Juglets* (Fig. 14.2:10–19). Although found in Crusader and Ayyubid occupation levels in Yoqne'am and Jerusalem (Avissar 1996: 169; Tushingham 1985: Figs. 37.18, 38.32), this type, with or without painted decorations, is a guiding fossil for the Mamluk period (late 13th century). It is characterized by a light red coarse clay, unevenly fired, leaving a coarse grey core. The clay contains a large amount of white grits in various sizes and negatives of organic inclusions such as straw. Some are slipped and burnished (Fig. 14.2:12) or incised and pinched (Fig. 14.2:13), while others were white or pinkish slipped on the outer and inner surface under a painted decoration in red, brown or black. The most dominant decorations are of geometric patterns. The vessel was coil-made and shaped with a linen or jute cloth, which often left a mark on the vessel.

While this type began to appear in the late 12th century at Hama (Poulsen 1957: 270–274), its floruit was during the Mamluk era (Avissar and Stern 2005: 113; Mcquitty and Falkner 1993: Fig. 19.12; Johns, McQuitty and Faulkner 1989: Fig. 25; Pringle 1985a: 176; Tushingham 1985: Fig. 42. 15–18; Pringle 1984: 95; de Vaux and Steve 1950: 133; Baramki 1944: 71 and Whitcomb 1988: Fig. 1.4B).

A petrographic analysis of Mamluk Hand-Made Geometric-Painted Ware (hereafter HMGP) was published in 2014. The results suggest that handmade plain wares were manufactured in multiple production centres, and that the painted samples in themselves cannot be viewed as a single industry, or even as having a uniform production mode; and that both plain and decorated handmade pottery are often the products of a specialized craft, with regional and likely intra-regional distribution (Gabrieli, Ben-Shlomo and Walker 2014).

*1Ac. Buff and Buff Self-Slipped Wares with or without decorations* (Fig. 14.3:1–14).

These vessels, mainly jugs, juglets, and pilgrim flasks, are characterized by the colour of their outer surfaces, which runs from light yellowish grey to very light grey or greenish/grey.

The life span of this group is fairly long, from the late 7th century (Rosen-Ayalon 1974: 193; Kervran 1977: Fig. 27:1) to the 14th century. It appears in Hama, Damascus, Jerusalem, Khirbat Din'ila, and 'Akko (Poulsen 1957: 242–264, Group DXVIIIa–f; Toueir 1973: Pl. IVa-c; Tushingham 1985: Fig. 34:20; Stern 2014: Fig. 4 and Stern 1997: 40, Fig. 4). The later examples differ from the earlier ones by their greenish hue (Stern 1997: 40) and relatively thick walls. Their manufacture was somewhat sloppy. Most of the moulded samples are decorated jugs.

These vessels were studied by Avissar and Stern and were dated by them to the Mamluk period (2005: Fig. 46:6). The strainer jug from Ateret (Fig. 14.3:8) has a parallel from Acre (Avissar and Stern 2005: 45) while several decorated jugs (Fig. 14.3:9–12, 14) have parallels from Khirbat Din'ila (Stern 2014: Fig. 5:6–7).

*1Ad. Large bowls or basins* (Fig. 14.4:1–10).

The Ateret specimens can be divided into two groups according to their production technique. The first group are large handmade bowls, the clay ranging from light brown (7.5YR 6/4) to dark red (2.5YR 6/8). The clay is coarse and contains white grits of various sizes and types: organic, quartz, basalt and crushed grog inclusions. The outer and inner surfaces are often slipped and burnished (Fig. 14.4:1–3, 8–10). The second group is of wheel- or handmade vessels well-thrown, levigated and hard fired, sometimes in a reduced atmosphere kiln, which give the vessels a grey hue. The clay includes hard black grit tempers, probably basalt, which might indicate a nearby workshop.

Two bowls from Ateret (Fig. 14.4:1, 8) have parallels from Khirbat Din'ila that are dated to the Mamluk period (Stern 2014: 2); a third bowl (Fig. 14.4:4) has parallels from Yoqne'am, Nazareth and Jerusalem dated to the late 12th-13th century (Avissar 1996: 128, Type 32, Fig. XIII.85.1; Bagatti 1947: Fig. 30: 2; and Tushingham 1985: Fig. 34:21).

**1B. Glazed Ware, Frit Ware and Lustre Ware**

*1Ba. Monochrome Glazed Bowls* (Fig. 14.5:1–23).

The dominant characteristic of this group is its monochrome lead glaze. The bowls were usually slipped before glazing in order to provide a better ground for the glaze. The clay's colour ranges from light red yellow (2.5YR 6/8 to 5YR 7/6) to red (10R 5/8), is relatively finely levigated and contains many small white grits (resembling cooking ware fabric). The inner surface is always white or pinkish slipped under a shiny thick monochrome lead glaze. The most common colours are mustard yellow or green. The outer surface is usually smoothed or trimmed with a sharp tool.

This type of glazing was termed 'Monochrome Glazed Slipped Ware' by Pringle (1985a: 177) and is well known from Yoqne'am (Avissar 1996: 91), Caesarea (Arnon 1999: Type 271: 332), Jerusalem (Tushingham 1985: Fig. 34.24–32), Burj al-Ahmar (Pringle 1986b: Fig. 49:50–57), St. Mary of Carmel (Pringle 1984), Hamat Gader (Boas 1997: 398), Cyprus (Megaw 1972: Fig. F4), the Aegean islands (Armstrong 1991: Fig. 7:19–20) and Tel 'Arqa (Hakimian and Salame'-Sarkis 1988: 12, Type AIII). The high ring base form was recorded in Khirbat Din'ila (Stern 2014: Fig. 7:13–14) and dated to the late Mamluk and Ottoman periods (Stern 2014: 84).

Three bowls with wide ledge rims from Ateret (Fig. 14.5:6, 8, 22) have parallels to bowls common

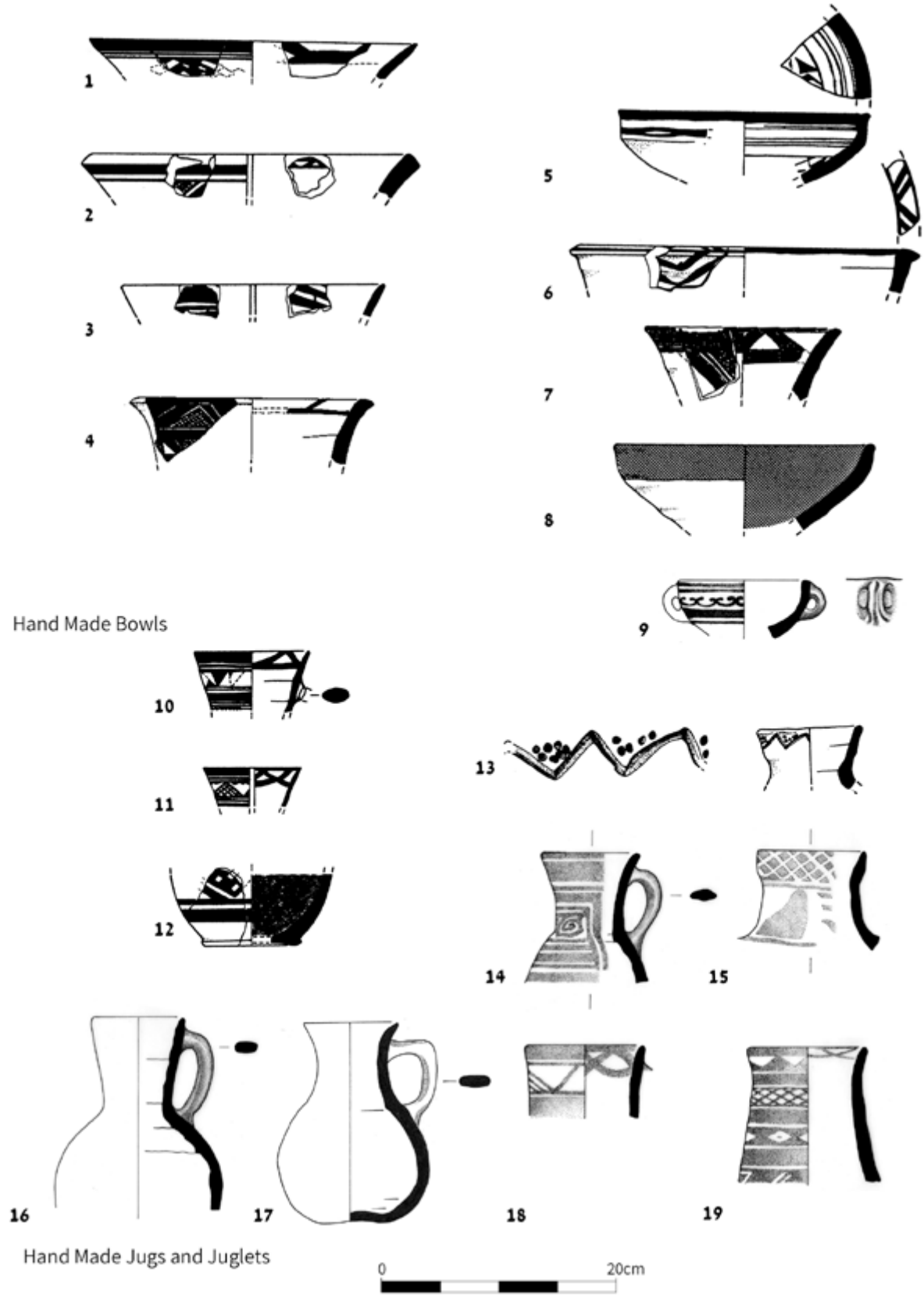



**Figure 14.2**. Handmade bowls, jugs and juglets

**Figure 14.2**. Handmade bowls, jugs and juglets (Types 1Aa-1Ab).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.558 B.5310 | Light brown ware (7.5YR 7/4), coarse, many white grits and crushed grog, white slip on int. and ext. under a red/brown painted geometric design. |
| 2 | Area C (1994) L.558 B.5514 | Ware and decorations as No. 1. |
| 3 | Area C (1994) L.576 B.5566 | Ware and decorations as No. 1. |
| 4 | Area E (1994) L.872 B.8562 | Ware as No. 1, including organic inclusions. |
| 5 | Area C (1994) L.585 B.5618 | Ware and decorations as No. 1. |
| 6 | Area E (1994) L.870 B.8555 | Ware and decorations as No. 1. |
| 7 | Area B (1993) L.302 B.3002 | Ware and decorations as No. 1. |
| 8 | Area? L.219 B.212 | Red ware (5YR 7/8), coarse, white grits. |
| 9 | Area R (2000) L.3010 B.013 | Red ware (10R 5/4), white slip under a brown geometric painted decoration. |
| 10 | Area E (1994) L. 852 B.8504 | Dark brown ware, coarse, many white and hard black grits, pinkish slip under a red/brown geometric decoration. |
| 11 | Area C (1994) L.555 B.5528 | Light ware (7.5YR), coarse, white and black grits, cream slip on int. and ext. under a red/brown decoration. |
| 12 | Area C (1994) L.562 B.5517 | Light red ware (2.5YR 6/8), coarse, white grits and quartz inclusions, pinkish slip under a red painted pattern. Cloth marks on int. surface. |
| 13 | Area E (1994) L.859 B.8574 | Light brown ware (7.5YR 7/3), coarse, unevenly fired, incised and punctured decorations on ext. surface near the rim. |
| 14 | Area A (2001) L.150 B.1138 | Dark brown ware (10R 5/3), pink slip under a brown geometric painted decoration. |
| 15 | Area A (2001) L.151 B.1153 | Brown ware, dark core, white slip under a brown geometric painted decoration. |
| 16 | Area A (2001) L.156 B.1166 | Red ware (10R 5/4), coarse, white slip on int. and ext. |
| 17 | Area E (1997) L.903 B.9001 | Light brown ware (10YR 7/4), unevenly fired, red slip and burnish on ext. |
| 18 | Area A (2001) L.151 B.1145 | Grey ware (GLey 1 4/N), pink slip under a brown geometric painted decoration. |
| 19 | Area A (2001) L.156 B.1166 | Grey ware (2.5Y 4/1) pink slip under a brown geometric painted decoration. |

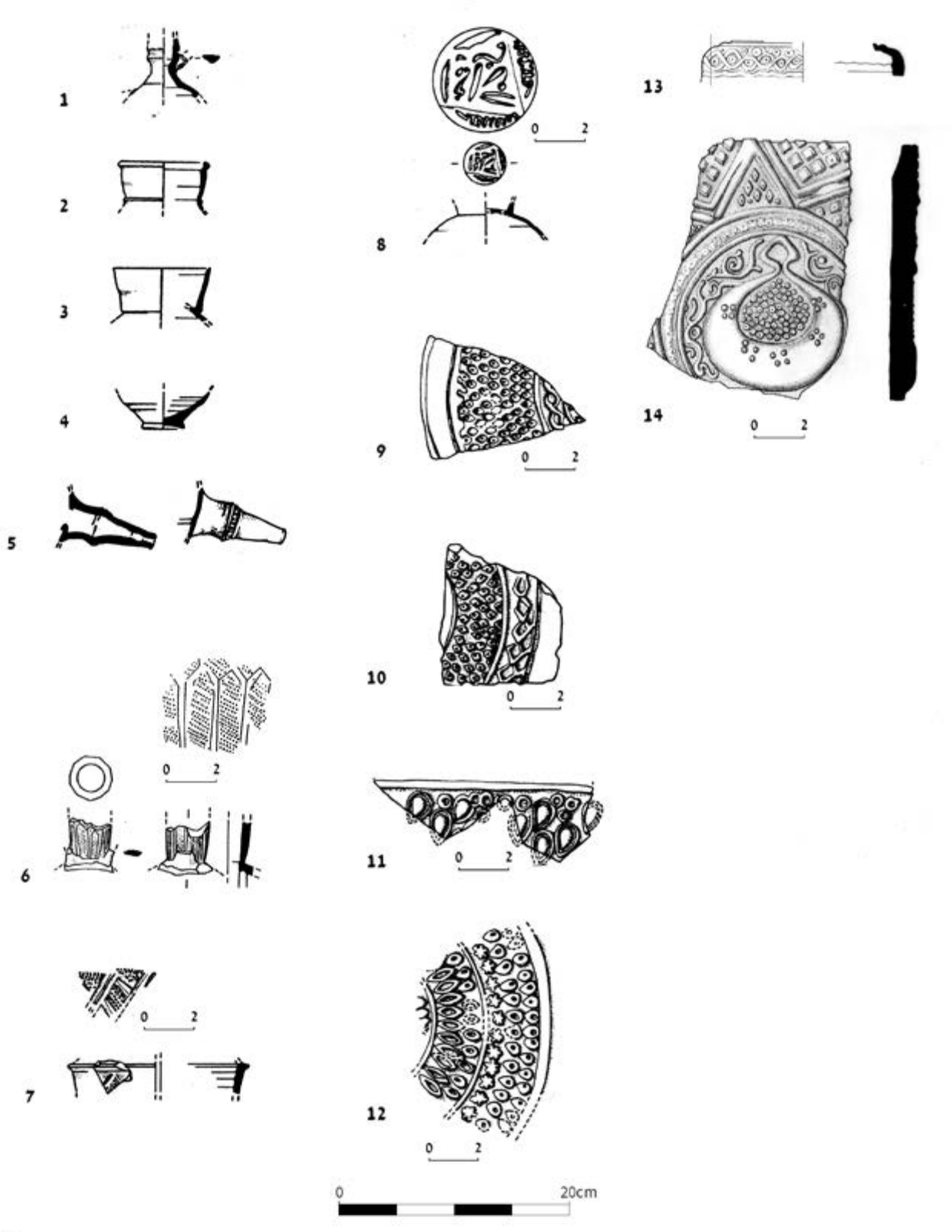



**Figure 14.3**. Buff and Buff Self-Slipped Wares

**Figure 14.3**. Buff and Buff Self-Slipped Wares (Type 1Ac).

| NO. | AREA (YEAR)<br>LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.555 B.5056 | Buff ware (2.5Y 8/3), porous, brittle in texture. |
| 2 | Area C (1994) L.569 B.5609 | Dark greyish brown ware (10YR 4/2), finely levigated, buff pale brown self-slip (10YR 8/2). |
| 3 | Area A (1996) L.261 B.2590 | As No. 1. |
| 4 | Area G (1994) L.200 B.202 | As No. 1. |
| 5 | Area H (1994) L.400 B.4000 | Pale brown ware (10YR 7/3), finely levigated, white and hard black grits, fired to a buff hue (2.5Y 8/4). |
| 6 | Area C (1994) L.558 B.5510 | Buff pale yellow (2.5Y 8/3), the neck was produced separately. |
| 7 | Area B L.353 B.0000 | Greenish buff ware (5Y 7/3), finely levigated. |
| 8 | Area? L.061 B.2590 | As No. 7. |
| 9 | Area C (1994) L.558 B.5510 | Ware as No. 6. |
| 10 | Area C (1994) L.558 B.5510.1 | As No. 6. |
| 11 | Area? L.605 B.6010 | Ware as No. 7. |
| 12 | Area B (1994) L.352 B.3516 | Ware as No. 6. |
| 13 | Area A (2001) L.151 B.1153 | Greenish-pale yellow buff ware (5Y 7/3), coarsely made. |
| 14 | Area E (2005) L.220 B.2030 | As No. 13. |

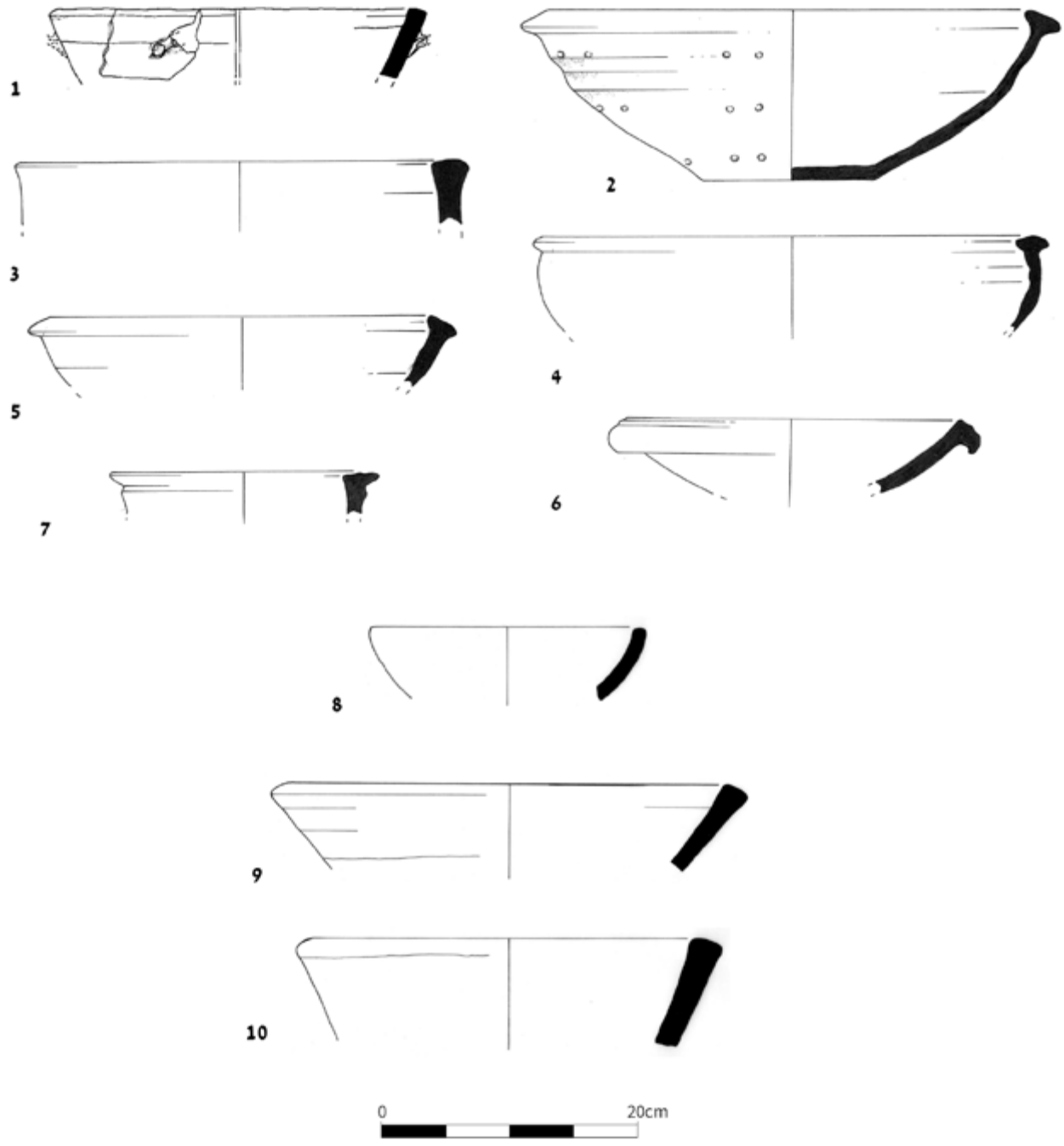



**Figure 14.4**. Large bowls or basins

**Figure 14.4**. Large bowls or basins (Type 1Ad).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.557 B.5510 | Light brown ware (7.5YR 6/4), handmade, coarse, white and black grits, organic inclusions, unevenly fired. |
| 2 | Area E (1995) L.529 B.5158.2 | Light red/orange ware (2.5YR 6/8), handmade, well-thrown, many white and hard black grits (probably basalt), excellent work, repairing holes are observed. Rim D. 0.375 m, base D. 0.14 m, height 0.14 m. See Fig. 4.21:5. |
| 3 | Area E (1996) L458 B.4515.2 | Light red ware (10R 6/6), handmade, coarse, many organic inclusions and white grits, unevenly fired in a rather low temperature, partly burnished on the inner surface. Rim D. 0.35 m. See Fig. 4.20:9. |
| 4 | Area B (1993) L.302 B.0000 | Red ware, well-thrown and fired, white and hard black grits. Rim D. 0.375 m. See Fig. 4.15:9. |
| 5 | Area E (1994) L.873 B.8575.8 | Orange/light red ware (2.5YR 6/6), well-thrown, unevenly fired to a greyish hue due to a reduced firing process. Rim D. 0.3 m. See Fig. 4.18:10. |
| 6 | Area E (1995) L.529 B.5133.4 | Light red ware (2.5YR 6/8), handmade, unevenly fired (dark brown core), coarse, many sizes white grits and quartz inclusions. Rim D. 0.25 m. See Fig. 4.21:6. |
| 7 | Area E (1994) L.856 B.8515.2 | Pink-Light brown ware (5YR 7/3), coarse See Fig. 4.19:7. |
| 8 | Area R (2000) L.3012 B.013 | Light reddish-brown ware (2.5YR 6/4), handmade, white grits and basalt. |
| 9 | Area A (2001) L.151 B.1153 | Pale red (10R 6/4), handmade, white grits and straw. |
| 10 | Area E (2005) L.226 B.2040 | Light reddish brown (2.5YR 6/4), handmade, black core, burnished. |

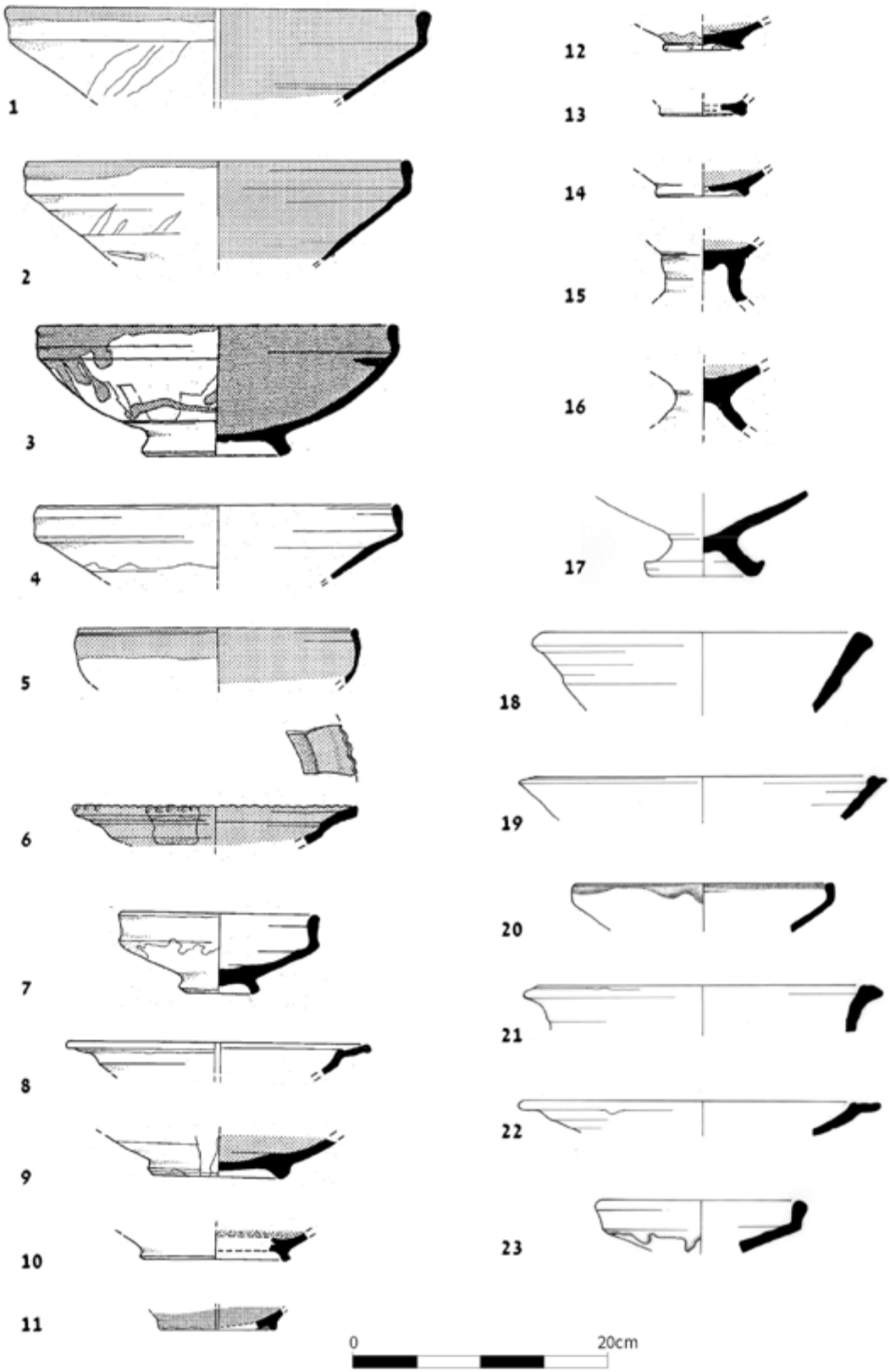



**Figure 14.5**. Monochrome Glazed Bowls

**Figure 14.5**. Monochrome Glazed Bowls (Type 1Ba).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area B (1994) L.372 B.3577 | Light red ware (2.5YR 6/8), finely levigated, white slip on int. and ext. near the rim under a lead green glaze. |
| 2 | Area B (1994) L.306 B.3040 | Ware as No. 1, white slip on int. under a pale green glaze. |
| 3 | Area K (1995) L.719 B.7049 | Redish yellow ware (5YR 7/6), finely levigated, white slip, green glaze. |
| 4 | Area E (1994) L.866 B.8544 | Ware as No. 1, yellowish slip on int. and ext. under a yellowish/green glaze on int. only. |
| 5 | Area E (1994) L.861 B.8520 | Ware as No. 1, green glaze on int. and ext. near the rim. |
| 6 | Area B (1993) L.302 B.3016 | Light red-yellow ware (5Y 7/8), unevenly fired, white slip on int. and ext. near the rim under a dark green glaze. |
| 7 | Area C (1994) L.554 B.5507 | Pink ware (5YR 7/4), fired to an orange hue, white grits and mica inclusions, white slip on int. and ext. near the rim under a yellow glaze. |
| 8 | Area E (1994) L.873 B.8579 | Red ware (10R 5/8), white slip on int. only under a mustard yellow glaze. |
| 9 | Area G (1994) L.200 B.2036 | Light red-pinkish ware (2.5YR 6/6), fired to an orange hue, white grits and mica inclusions, white slip under a green glaze on int. only. |
| 10 | Area G (1994) L.212 B.2153 | Light red ware (2.5YR 6/8), fired to a reddish brown hue (2.5YR 5/3), white slip on int. only under a green defective glaze. |
| 11 | Area E (1993) L.803 B.8013 | Yellowish/red ware (10YR 8/6), abundant grog inclusions, thick alkaline pale celadon green glaze applied directly to the surface. |
| 12 | Area B (1993) L.302 B.3016 | Light red ware (2.5YR 6/8), fired to a purplish hue, white slip under a green glaze on int. only. |
| 13 | Area B (1994) L.350 B.3503 | Ware as No. 12, white slip under an olive-green glaze on int. only. |
| 14 | Area B (1994) L.363 B.3561 | Ware as No. 12, white slip under a dark green glaze on int. only. |
| 15 | Area B (1993) L.305 B.3042 | Ware as No. 12, white slip under a green glaze on int. only. |
| 16 | Area E1 (1995) L.506 B.5010 | Ware as No. 12, unevenly fired to reddish brown hue (2.5YR 4/3), white and black grits, white slip under a green glaze on int. only. |
| 17 | Area E (2000) L.704 B.7028 | Light reddish brown (2.5YR 6/4), fine, light green glaze under a white slip. |
| 18 | Area E (2011) L.205 B.2012 | Dark grey ware (1 4/N), coarse. basalt tempers, yellowish green glaze. |
| 19 | Area K (1995) L.704 B.7025 | Red ware (2.5YR 5/6), fine, transparent glaze on int. |
| 20 | Area R (2000) L.3010 B.013 | Red ware (10R 5/4), fine, green glaze under a white slip int. |
| 21 | Area E (2000) L.703 B.7006 | Grey ware (10R 4/1). Coarse, olive-green alkaline glaze under a white slip on int. |
| 22 | Area E (2000) L.703 B.7006.2 | Red ware (10R 5/6), white grits, green glaze under a white slip on int. |
| 23 | Area E (2005) L.220 B.2030 | Light red ware (10R 6/6), finely made, yellow glaze under a white slip on int. and a running glaze on ext. |

in the Crusader and Ayyubid periods, the late 12th-13th centuries, from Yoqne'am, Caesarea, Transjordan, Jerusalem and Giv'at Yasaf (Avissar 1996: Types 34–38; Pringle 1985a: Fig. 3.15; Thalmann 1978: 30, Figs. 33:6–11, 34:1–15, 35:59; Stern 1999; and Tushingham 1985: 143).

*1Bb. Monochrome Glazed Sgraffito Decorated Bowls* (Fig. 14.6:1–16).

These sgraffito decorated bowls are distinguished mainly by incised decorations on the vessels' surfaces, which were coated with a white or light-coloured slip while leather hard. The decoration was engraved or incised through the layer of slip, so that the original colour of the clay shows through. When cooled after firing, the vessel was coated with a monochrome glaze and then fired a second time. The final result was an incised decoration in a darker hue.

The origin of this technique lies in Egypt during the 5th to 7th centuries CE, where it was influenced by Coptic art. It spread to Mesopotamia and Iran where it flourished during the 10th to 11th centuries (Fehervari 1973: 61–62). Sgraffito decorated vessels became very popular in the Byzantine ceramic industry (Papanikola-Bakirtzi 1999) and were well recorded in medieval sites (Hakimian and Salame'-Sarkis 1988: 3, Type AI, Fig. I; Thalmann 1978: 24–26, Types C–D; Tushingham 1985: Fig. 39:21; Pringle 1985a: 183; Pringle 1986b: 150 and Megaw 1972: Fig. 22). They are dated at these sites to the 12th-14th centuries.

The examples found at Ateret were manufactured from red clay (resembling cooking ware clay), relatively well levigated and contain small white grits. All the vessels were white slipped under a green or yellow glaze. The incisions were made with a thin delicate tool (Fig. 14.6:1–3, 16), or gouged with a wide tool (Fig. 14.6:5). Most of the bowls are decorated on the interior (Fig. 14.6:1–3, 16), a few are decorated on the exterior (Fig. 14.6:8–15.). Such a style is recorded in Yoqne'am and Capernaum and are dated to the 13th-14th centuries (Avissar 1996: 98, Type 47, Fig. XIII.35 and Loffreda 1974: Fig. 9: 6). In their study of Crusader, Ayyubid and Mamluk pottery, Avissar and Stern attributed the style with wider incisions to the Mamluk era (2005: Figs. 4, 6), while the style with thinner incisions they attributed to the Crusader period (2005: Figs. 2, 4).

*1Bc. Colour Splashed/Mottled Glazed Bowls, with or without Sgraffito Decorations* (Fig. 14.7:1–5).

Colour splashed glazed vessels originated in the 9th century in the Islamic world (Wilkinson 1973: 54; Northedge, Bennett and Bowsher 1992: 160.2; Najjar 1989: Fig. 9:37 and Avissar 1996: 78). This type seems to be the earliest glazed group influenced by Chinese T'ang Ware (Fehervari 1973: 35 and Atil 1973: 3), and continues through the Crusader and Mamluk periods (Avissar 1996: 87; Pringle 1985b: 3.20, Stern 1997: Figs. 6.62–63 and Arnon 2008a: Types 262, 315).

The bowl body was covered with a white slip under a transparent glaze over which a coloured glaze was applied: splashed, mottled or painted with a brush. The manufacture of the sgraffito decorated type is identical to the Monochrome Glazed Sgraffito Decorated Bowls (Type 1Bb), with one exception: after the first firing and before the glazing, the decoration was enhanced by additional colouring. All the Ateret vessels consist of a Pale brown-light red/red ware (10YR 7/3–10R 5/8), finely levigated and well-thrown. The bowl forms are diverse: there are bowls with ledge rims (Fig. 14.7:1) and carinated bodies (Fig. 14.7:3) identical to the Monochrome Glazed Ware (Type 1Ba). The most common applied colours are green and yellow splashes. The inner surface is always white slipped under the incisions and glazing, in order to provide

a lighter background to the coloured decorations. Only four bowls are slipped on the interior and exterior, and they belong to the St. Symeon type dated to the 13th century (Boas 1994: 108).

The broad distribution of the style all over the Mediterranean has driven scholars to try to trace the type's production centres. Workshops were found at St. Symeon, the Crusader port of Antioch (Lane 1937: 54), in the Greek islands (Papanikola-Bakirtzi 1999: 158–265) and in Cyprus (Papanikola-Bakirtzi 1989). Boas suggests more than a single production centre, and even local manufacture (1994: 120). Following Boas' description from Hammat Gader (1997: 394), it seems that the Ateret specimens are from a local or regional production centre.

*1Bf. Under-Glazed Slip Painted Frit Ware* (Figs. 14.7:6–13, 15–18; 14.8).

The main characteristics of this type are its distinctive fabric and glazing technique. The vessels were produced from a white clay that consists of crushed glass quartz resembling Egyptian Faience, probably influenced by Chinese Ding and Qingbai porcelain (Watson 1985: 208). The wares were decorated with black painted slip, or with a combination of a blue and black painted slip, under a colourless or turquoise alkaline glaze. The black and blue decorations appear in the second half of the 13th century and flourished during the 14th century (Porter 1981: 9). The style originated in Iran (Lane 1937: 32) and was also known in Egypt (Watson 1999: 302).

The first Frit Ware appeared in Syria at Tell Minis in the 12th century and in Raqqa in the 13th century (Porter 1981: 9–10). It seems that the Syrian ware is closer in style to the Egyptian ware, while technically it was influenced by the Iranian tradition. In Tell 'Arqa, Yoqne'am and Beth She'an (where thirty bowls of this type were retrieved in a pit under a floor), the Frit Ware are dated to the 13th and 14th centuries (Hakimian and Salame'-Sarkis 1988: 32, Types As.2–3; Avissar 1996: 115 and Sion 2000: 41). Similar bowls to the ones found at Ateret (Fig. 14.7:12, 16) were found also in Khirbat Din'ila and were dated by Stern to the Mamluk period (Stern 2014: Fig. 11.3).

This was the largest group among the imported vessels unearthed at Ateret: more than twenty sherds were found, most of them decorated with black slip painted geometric or floral designs resembling Raqqa Ware Type 2 imported from Syria, which might indicate a 12th or early 13th century date (Porter 1981: 9).

*1Bg Lustre ware* (Figs. 14.7:14).

This outstanding group, considered to be an Islamic invention (Fehervari 1973: 41), is barely represented in Ateret: only three true lustre fragments were found. The type is characterized by its opaque white (greyish in the later specimens) background that was produced from tin flux mixed with lead. Over this background a lustrous painted decoration was applied. This effect was achieved by adding silver and copper to the pigments and by firing the vessel for a second time in a reduced atmosphere (Caiger- Smith 1985: 31). These vessels were considered luxury wares.

Although some scholars reject an Egyptian origin before the 11th century and insist on an exclusively Iraqi origin (Frierman, Asaro and Michel 1978: 111), the data from Caesarea (Arnon 2008a: 40, 42) reinforces the claim of others for a Tulunid and Fatimid date (Jenkins 1968: 124; Kühnel 1970: 126 and Lane 1937: 20). Probably due to the famine in Egypt in 1065–1072, or the destruction of the potters' quarter in Fustat in 1168, during the late 11th and 12th centuries, new production centres were established: in Tell Minis and Raqqa in Syria and in Ray and Kashan in Iran (Kubiak 1970b: 113–123;

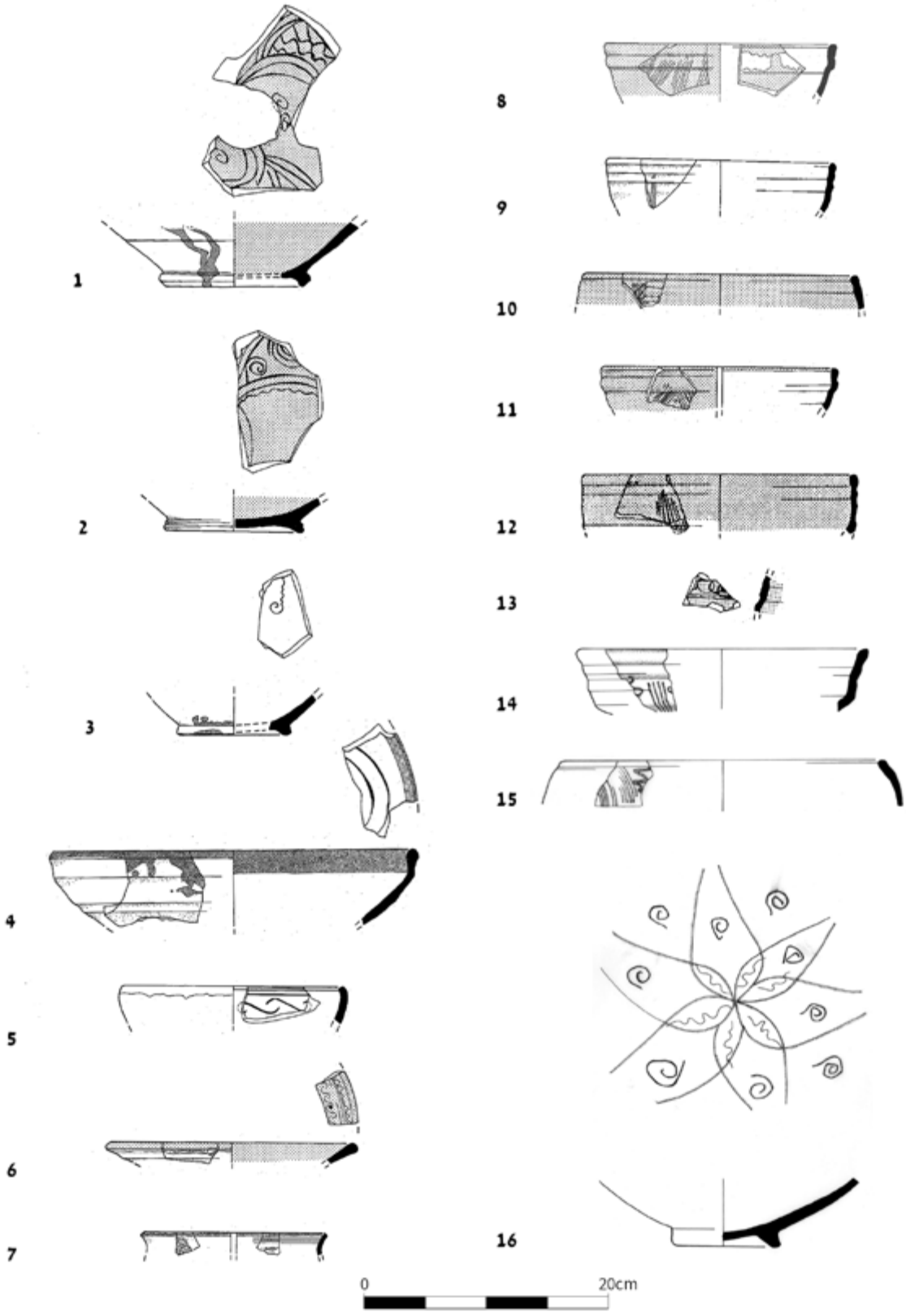



**Figure 14.6**. Monochrome Glazed Sgraffito Decorated Bowls

**Figure 14.6**. Monochrome Glazed Sgraffito Decorated Bowls (Type 1Bb).

| NO. | AREA (YEAR)<br>LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.565 B.5523 | Red ware (10R 5/8), finely levigated, white slip under a green glaze and sgraffito decorations on int. only. |
| 2 | Area E (1994) L.852 B.8504 | Red ware (2.5YR 5/6), white slip under a dark green glaze and sgraffito decorations on int. only. |
| 3 | Area B (1994) L.337 B.3544 | Ware as No. 1, white slip under a mustard-yellow glaze and sgraffito decorations on int. only. |
| 4 | Area C (1994) L.585 B.5618 | Ware as No. 1, white slip under a yellow glaze on int. and ext. and sgraffito decorations on int. only. |
| 5 | Area C (1994) L.552 B.5505 | Ware as No. 1, white slip on int. and ext. under a yellow glaze on int. only. |
| 6 | Area C (1994) L.565 B.5523 | Ware as No. 1, white slip under a green glaze on int. only. |
| 7 | Area C (1994) L.558 B.5514 | Ware as No. 1, white slip on int. and ext. under a pale yellow glaze on int. and yellow/brown stains on ext. |
| 8 | Area B (1993) L.302 B.3009 | Light red ware (2.5YR 6/6), white slip under a green glaze on int. and ext. |
| 9 | Area B (1994) L.360 B.3551 | As No. 8. |
| 10 | Area B (1994) L.362 B.3559 | As No. 8. |
| 11 | Area?<br>L.350 B.3500 | As No. 8. |
| 12 | Area B (1993) L.302 B.3016 | As No. 8. |
| 13 | Area B (1993) L.305 B.3042 | Light red ware (2.5YR 6/8), white slip, green glaze. |
| 14 | Area K (1995) L.704 B.7028 | Light brown ware, green glaze on int. and ext. and incised decorations on ext. |
| 15 | Area A (2001) L.156 B.1166 | Pale brown ware (2.5 YR 6/6), green glaze on int. and ext. and incised decorations on ext. |
| 16 | Area K (1995) L.722 B.7056 | Red ware (10R 5/6), yellow glaze on int. and brown sgraffito. |

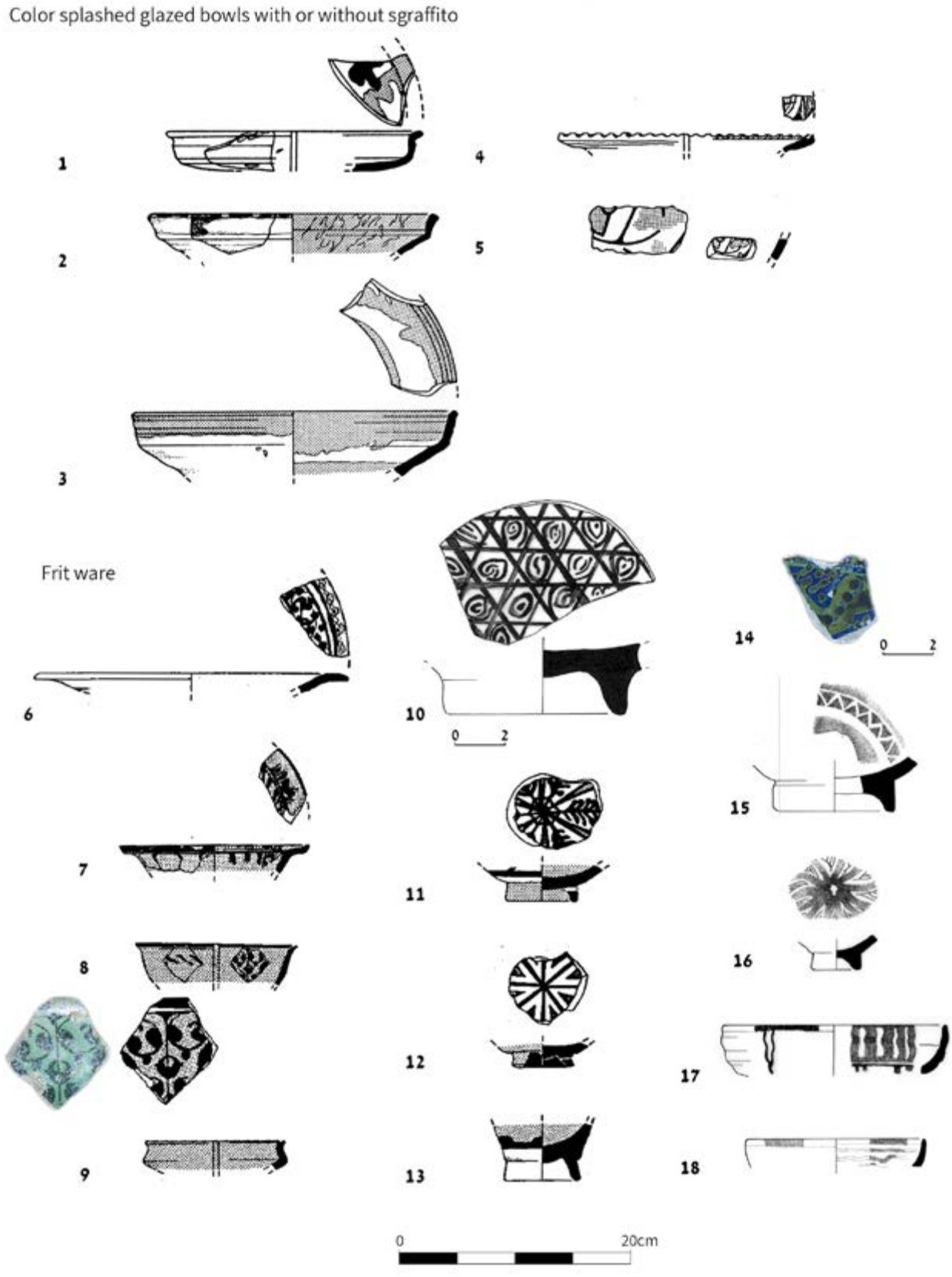

Color splashed glazed bowls with or without sgraffito
1
2
3
4
5
Frit ware
6
7
8
9
10
0 2
11
12
13
14
0 2
15
16
17
18
0 20cm

**Figure 14.7.**

**Figure 14.7.** 1–5: Color Splashed/Mottled Glazed Bowls, with or without Sgraffito Decorations; 6–18: Frit Ware (Types 1Bf-1Bg) and Lustre Ware (Type 1Bg); (Type 1Bc).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area? L.138 B.1344 | Light brown/buff ware (10YR 7/3), finely levigated, white slip under a colour splashed glaze in green, mustard yellow, pale yellow and purplish brown, on the int. only. |
| 2 | Area E1 (1995) L.511 B.5030 | Red ware (10R 5/8), white slip under a colour splashed glaze in green and yellow on the int. only. |
| 3 | Area E (1993) L.802 B.8009 | Yellowish/brown ware (10YR 7/6), grog inclusions, white slip on int. and ext. near the rim under a colour splashed glaze in green and yellow on int. only. Rim D. 0.24 m. |
| 4 | Area E (2005) L.200 B.2036 | Pink ware (5YR 7/4), well-thrown and hard fired, white slip on int. and ext. under a colour splashed glaze in green and yellow with sgraffito decorations. |
| 5 | Area G (1994) L.200 B.2043 | Red ware (2.5YR 5/6), white slip, green and yellow glaze with sgraffito decorations. |
| 6 | Area G (1994) L.225 B.2233 | Greyish ware (5Y 7/2), porous and brittle in texture, white slip on int. and ext. under a transparent alkaline glaze, and black Fatimid style floral decorations on int. |
| 7 | Area? L.505 B.5006 | Ware as No. 6., black decorations. |
| 8 | Area? L.323 B.3572 | Ware as No. 6., black decorations on int. and ext. under a greenish alkaline glaze. |
| 9 | Area? L.350 B.3503 | Ware as No. 6., white slip on int. and ext. under a turquoise alkaline glaze. |
| 10 | Area E (1996) L.454 B.4506 | Ware as No. 6., dark blue decorations under a transparent alkaline glaze. |
| 11 | Area A (1998) L.602 B.4004 | Ware as No. 6., dark blue/black decorations under a transparent alkaline glaze. |
| 12 | Area G (1994) L.200 B.2012 | Ware as No. 6., black decoration under a transparent alkaline glaze. |
| 13 | Area B (1993) L.301 B.3005 | Ware as No. 6., black decoration under a transparent alkaline glaze. |
| 14 | Area K (1995) L.719 B.7047 | Light grey ware (2.5Y 7/2), blue and dark brown decorations on a greenish/greyish background. |
| 15 | Area E (2000) L.703 B.7006.3 | Ware as No. 14., blue and dark brown geometric decorations on a greenish/greyish background. |
| 16 | Area L (1995) L.704 B.7010 | Ware as No. 14., blue and dark brown geometric decorations on a greenish/greyish background. |
| 17 | Area E (2005) L.226 B.2040 | Ware as No. 14., blue and dark brown geometric decorations on a greenish/greyish background. |
| 18 | Area E (2005) L.226 B. 2040 | Ware as No. 14., blue and dark brown geometric decorations on a greenish/greyish background. |

Mason 1995: 8). A 12th century date is also given in Yoqne'am and Caesarea (Avissar 1996: 87 and Pringle 1985a: Fig. 14.80).

The 12th-13th century specimens are characterized by a greyish frit ware, which resembles the vessels from Ateret. These could be considered as Raqqa Ware Type 3, which does not date before 1200 CE (Porter 1981: 25).

*1Bd. Under Glazed Slip Painted Bowls, in green, yellow, or transparent glaze* (Figs. 14.8:1–10, 14.9:1–11).

This group is characterized mainly by its red or light brown ware, finely levigated and well-thrown. A slip painted decoration is applied, usually to the vessels' inner surface, under either a transparent, yellow, or green lead glaze. In the first case, the decorations appear as white or cream on a red/brown background, in the second, the slip paint has a yellowish tone, while in the third the design appears in green.

Of the specimens from Ateret, 75 percent are of the second and third types, and are yellow glazed or green. Although found in late 12th century strata in Yoqne'am, most of the Under Glazed Slip Painted Bowls, especially the carinated ones, originated in the Mamluk stratum (Avissar 1996: 96). The green glazed bowls also appear in Crusader loci, while in the Mamluk period it seems that the yellow glazed bowl was preferred.

This bowl is well known all over the Eastern Mediterranean during the late 12th-14th centuries (Papnikola-Bakirtzi 1999: 161, Thalmann 1978: Fig. 331, Rosser 1985: Fig. 15; Smith 1973: Pl. 72.494; Pringle 1986b: 50.66; Baramki 1944: Fig. 11.7; de Vaux and Steve 1950: Fig. 32.9; Arnon 1999: 227 Fig. 10; Dolinka: Fig. 1; Stern 1999: 127, Figs. 1.10–14).

One bowl from Ateret (Fig. 14.8:1) was distorted during the production process, which might indicate the existence of a local workshop.

*1Be. Zeuxippus Ware* (Fig. 14.9:12).

This is one of the more debated types, characterized by a dark red/purplish ware, hard and dense fabric, thin potting, a shiny glaze and meticulous decoration (Papanikola Bakirtzi 1999: 22). Early shapes were decorated with incisions enhanced by yellow/brown colour, while the later vessels have a yellow/orange glaze.

The group's name was given after the place it was first identified in large quantities, the Zeuxippus Bathhouse in Constantinople. Once thought to have originated there or in the vicinity, this assumption was later abandoned and analytical analysis points towards the Aegean region and Cyprus (Megaw 1989: 259–266, Megaw and Jones 1983: 263, Boas 1994: 118 and Hayes 1995: 197). It dates from the 12th to the mid-13th centuries and was one of the first types to employ the use of tripod stilts.

Zeuxippus Ware is well distributed all over the Eastern Mediterranean, from Greece to the Black Sea, Cyprus, Egypt and the Levant coast (Papanikola-Bakirtzi 1999: 22, Pringle 1986b: Fig. 1, Megaw 1968: 74, Stern 1997: 52). In her study of the pottery of Sparta, Armstrong noticed a somewhat different Zeuxippus Ware and suggested that it belonged to a local production she termed 'Zeuxippus Derivative Ware' (1992). This group is characterized by its relatively soft and brittle fabric, a light hue, and is relatively thick. Typologically, these vessels resemble Cypriot Under-Glaze Painted Ware and sgraffito decorated bowls and are considered to be a later variation of the original (Stern 1997: 54).

Following Armstrong and Stern, it would seem that the specimen found at Ateret belongs to this category. It was probably imported, but further analysis is required to trace its production origin.

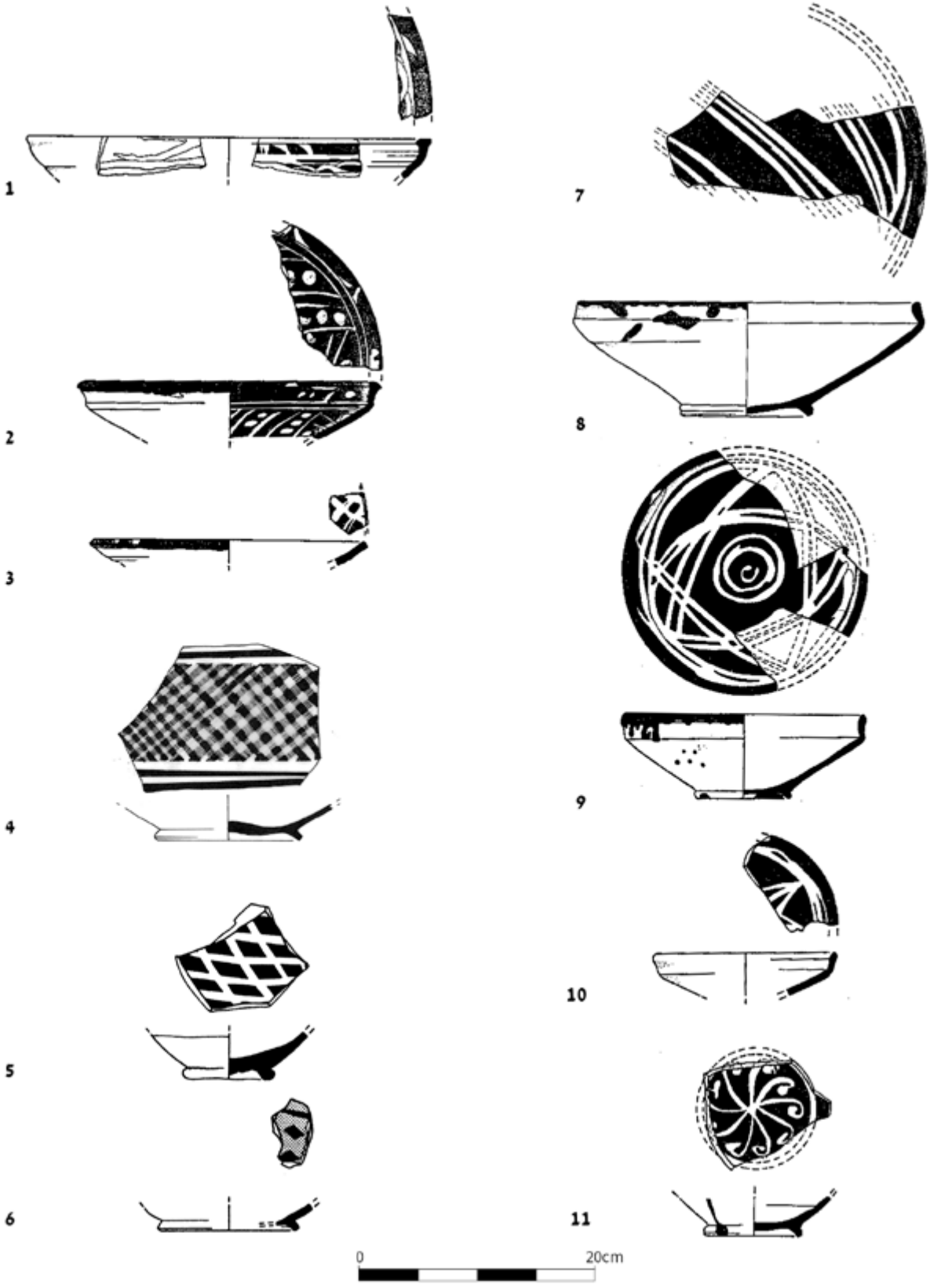



**Figure 14.8.** Under Glazed Slip Painted Bowls

**Figure 14.8.** Under Glazed Slip Painted Bowls (Type 1Bd).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.557 B.5510 | Light red/orange ware (2.5YR 6/8), finely levigated and well-fired, white painted decorations under a yellow glaze. The vessel is damaged due to the high temperature in the kiln. |
| 2 | Area?<br>L.? B.? | Ware and decorations as No.1. |
| 3 | Area C (1994) L.585 B.5618 | Ware and decorations as No. 1. |
| 4 | Area E (1996) L.454 B.4506 | Red ware (10R 5/8), white painted decorations under a green glaze. |
| 5 | Area E1 (1995) L.511<br>B.5030 | Light red ware (2.5YR 6/6), white painted decorations under a yellow glaze. |
| 6 | Area C (1994) L.558 B.5525 | Ware and decorations as No. 4. |
| 7 | Area K (1995) L.722 B.7058 | Red ware (10R 4/6), white painted decorations under a yellowish/brown glaze. |
| 8 | Area K (1995) L.772<br>B.7058.1 | Ware and decorations as No. 7. |
| 9 | Area E1 (1995) L.511<br>B.5030 | Ware and decorations as No. 7. |
| 10 | Area K (1995) L.726 B.7081 | Red ware (10R 5/6), white painted floral design under a yellowish/brown glaze. |

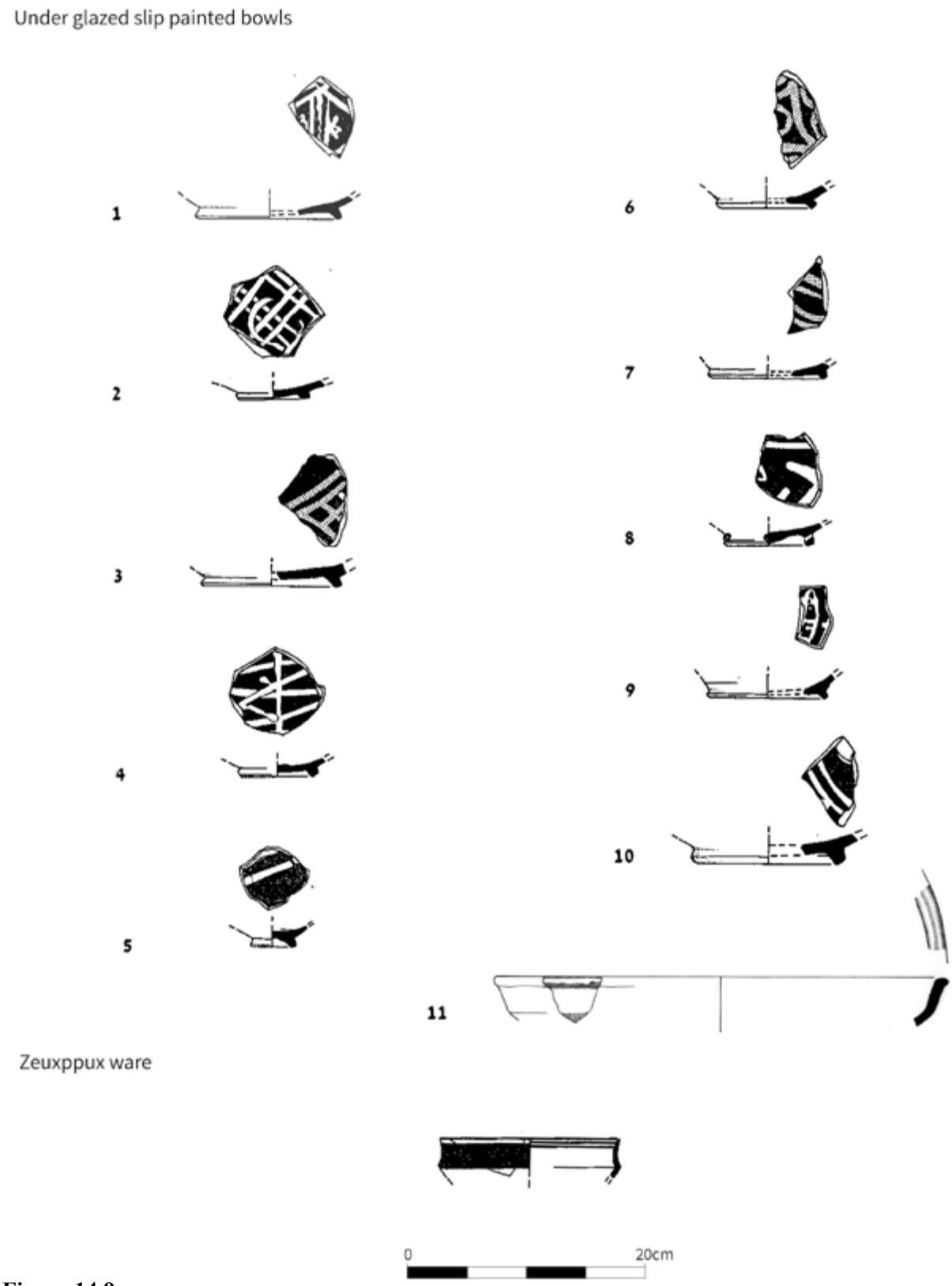

Under glazed slip painted bowls
1
2
3
4
5
6
7
8
9
10
11
Zeuxppux ware
0
20cm

**Figure 14.9.**

**Figure 14.9.** 1–11: Under Glazed Slip Painted Bowls (Type 1Bd); 12: Zeuxippus Ware (Type 1Be).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.555 B.5528 | Red ware (10R 5/8), white painted under a yellow glaze. |
| 2 | Area C (1994) L.585 B.5608 | Light red ware (2.5YR 6/8), decorations as No. 1. |
| 3 | Area C (1994) L.555 B.5530.5 | Ware as No. 1., white painted decorations under a green glaze. |
| 4 | Area E1 (1995) L.502 B.5026 | Ware and decorations as No. 1. |
| 5 | Area G (1994) L.232 B.2299 | As No. 1. |
| 6 | Area E (1994) L.874 B.8580 | Red ware (2.5YR 5/8), quartz inclusions, white slip under a silver green glaze. |
| 7 | Area C (1994) L.570 B.5546 | As No. 1. |
| 8 | Area C (1994) L.570 B.5544 | Red/orange ware (5YR 7/6), white painted under a yellow glaze. |
| 9 | Area C (1994) L.555 B.5560 | As No. 1. |
| 10 | Area C (1994) L.565 B.5523 | As No. 1. |
| 11 | Area E (2005) L.226 B.2040 | Ligh red ware (10R 5/4), finely levigated, slip painted yellow and brown under a transparent glaze. |
| 12 | Area B (1993) L.305 B.3024 | Light red ware (2.5YR 6/6), finely levigated, white slip under a yellow glaze and sgraffito decorations on int., and a white slipped band under a yellow glaze near the rim on ext. |

## Cooking Wares

### 2A. Unglazed Wares

*2A. Hand-Made Cooking Ware* (Fig.14.10:15–16, 20).

About half of the cooking vessels found at Ateret were unglazed and are characterized mainly by their distinctive potting technique. They are hand-made, produced by coils and smoothed with a wet cloth. The shape is globular, with a short rim or a holemouth opening. The clay is coarse and poorly potted, containing large quantities of white grits in various sizes and many quartz particles, due to sand inclusions. The vessels are unevenly fired, leaving a thick grey core which can be seen in the section. The pots are incised or thumb-decorated (Fig. 14.10:15) and the handles are triangular shaped and decorated with incisions.

Handmade cooking vessels are well recorded in Mamluk occupation levels dated to the 13th-14th centuries in Pella, Jerusalem, Yoqne'am, Burj al-Ahmar, Caesarea and St. Mary of Carmel (Smith 1973: 242–243, Fig. 59. 1024; Tushingham 1985: Fig. 45. 16–17; Avissar 1996: 138; Pringle 1986b: Fig. 41; Arnon 2008a: Type 771a, 369; and Pringle 1984: Fig. 3. 2–4).

### 2B. Glazed Wares

*2B1. Glazed Frying Pans* (Fig. 14.10:1–8).

Wheelmade glazed frying pans made their first appearance during the 10th century and are recorded at Caesarea and Yoqne'am (Arnon 1999: 226.a-h and Avissar 1996: 139, Types 13–14). This cooking vessel is characterized by a flat base covered with a thick transparent glaze, everted rim, triangular section and strap handles. The Early Islamic specimens are glazed only on the base while the later ones are glazed up to the rim.

Frying pans are well known from Yoqne'am, 'Akko, Caesarea, Tel 'Arqa, St. Mary of Carmel and Hamat Gader (Avissar 1996: Fig XIII.102, Type 15; Arnon 2008a: Type 775, 373; Pringle 1985a: Fig. 3. 9; Thalmann 1978: Fig. 31.5; Hakimian and Salame'-Sarkis 1988: Fig. 11.1–4, Type D1.1.1; and Boas 1997: Fig. I.14).

*2B2. Glazed Globular Cooking Pots* (Fig. 14.10:9–14, 17–19).

A new closed type of cooking ware appeared during the 10th century and replaced the open casserole, which had been common throughout Late Antiquity up to the Umayyad and Abbasid periods (Arnon 2008a: Type 732, 218; Avissar 1996: 133 and Stacey 1995: 167). A cooking pot of this type was found in an 11th century hoard in Caesarea (Arnon, Laster and Pollak 2008c: Fig. 1). This pot dates from the 11th century, with minute differences, to the 12th and 13th centuries (Arnon 2008a: Type 752, 295 and Type 761, 328). The later versions are more globular in form and usually have strap handles, very often accompanied by thumb decorations. They have a slightly everted ledge rim smeared with colourless glaze, which appears brown on the entire interior surface.

Similar cooking pots were found at Tel 'Arqa, Cyprus, Hamat Gader, Yoqne'am, Caesarea, and Burj al-Ahmar (Thalmann 1978: Fig. 32; Megaw 1972: 334; Boas 1997: Pl. I; Avissar 1996: 136–137; Arnon 2008a: Type 773, 372 and Pringle 1985a: Fig. 2.3–8). Similar cooking pots to those from Ateret (Fig. 9:10–14, 18) were found in Khirbat Din'ila and are dated to the Mamluk period (Stern 2014: Fig. 6:13, 14–16).

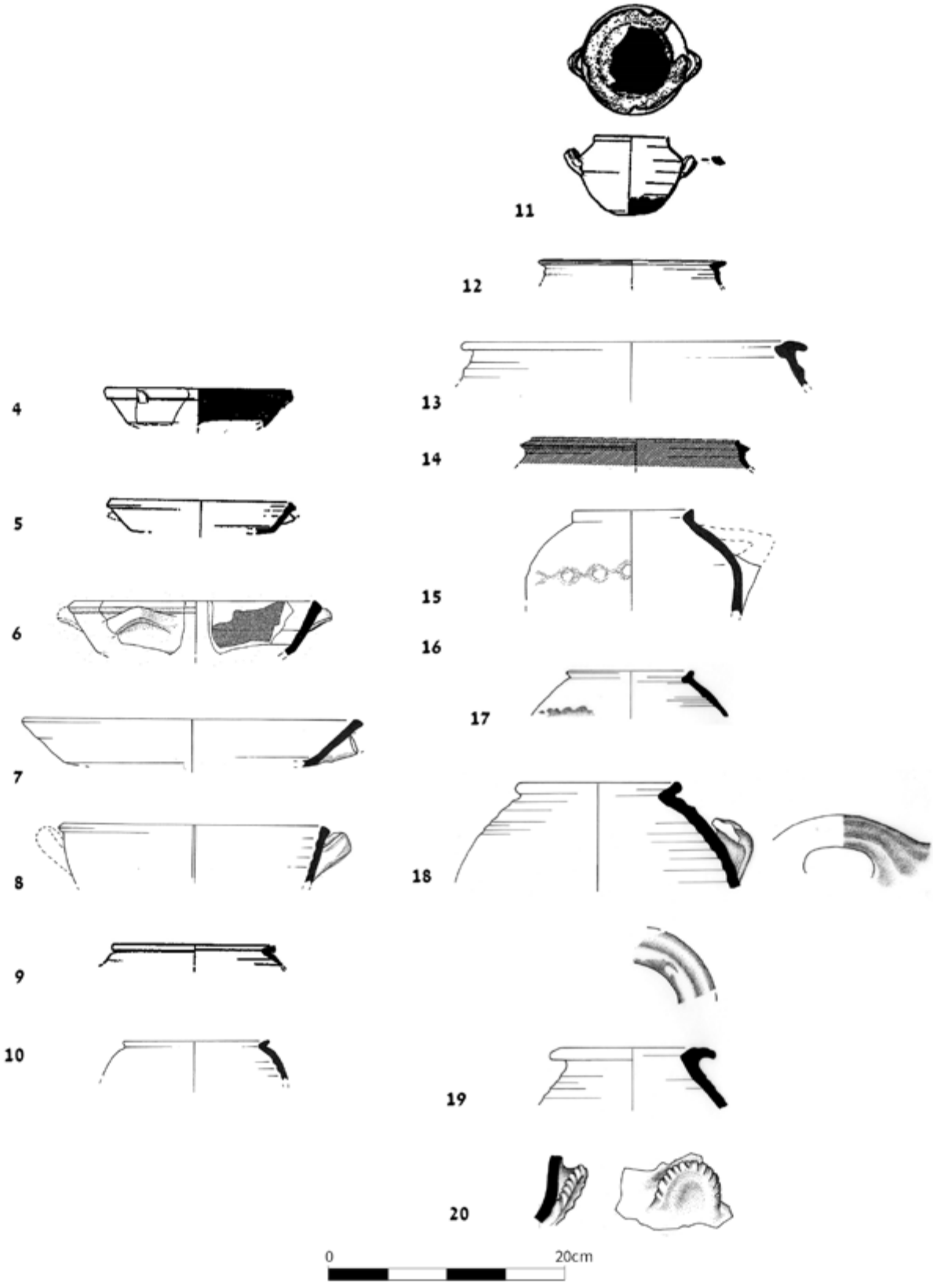



**Figure 14.10**. Cooking ware

**Figure 14.10**. Cooking ware (Types 2A-2B2)

| NO. | AREA (YEAR)<br>LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area E (1993) L.802 B.8009 | Yellowish brown ware (10YR 4/4), uneven fired, many white grits and quartz inclusions, covered by a thick dark brown glaze. Not illustrated. |
| 2 | Area E1 (1995) L.502 B.5026 | Ware and glaze as No. 1. Not illustrated. |
| 3 | Area E1 (1995) L.511 B.0000 | Red ware (10R 5/8), small white grits, covered by a dark brown glaze. Not illustrated |
| 4 | Area H (1994) L.404 B.4006 | As No. 3. |
| 5 | Area E (1995) L.529 B.5247.004 | Red ware (10R 5/8), dark brown glaze on int. only. Rim D. 0.2 m. See Fig. 4.20:13. |
| 6 | Area B (1993) L.311 B.3052 | Light red ware (2.5YR 6/8), underfired grey core, dark brown glaze on int. only. |
| 7 | Area E (1995) L.532 B.5156.3 | Red ware (10R 5/8), well-thrown, porous, dark brown glaze on int. only. Rim D. 0.275 m. See Fig. 4.22: 4. |
| 8 | Area E (1995) L.529 B.5133.5 | Red ware (2.5YR 4/8), well-thrown, porous and brittle, dark brown glaze on int. only. Rim D. 0.225 m. See Fig. 4.23: 12. |
| 9 | Area F (1994) L.900 B.9001 | Red ware (10R 5/8), white grits, quartz and black inclusions. |
| 10 | Area B (1993) L.307 B.3018.2 | Red ware (10R 5/8), well-thrown, dark brown glaze on rim. Rim D. 0.125 m. See Fig. 4.17: 4. |
| 11 | Area?<br>L.000 B.0000 | Red ware (2.5YR 4/6), fired to a purplish hue (2.5YR 3/2), remnants of dark brown glaze on int. bottom, damaged due to high kiln temperature. |
| 12 | Area A (1997) L.713 B.7040 | Light red ware (2.5YR 6/6), white and hard black inclusions. |
| 13 | Area B (1993) L.307 B.3041.2 | Red ware (2.5YR 5/8), coarse, dark brown glaze on rim. Rim D. 0.25 m. See Fig. 4.17: 3. |
| 14 | Area F (1994) L.901 B.9008 | Red ware (10R 5/8), fired to purplish hue (2.5YR 4/3), drops of dark brown glaze on the int. surface. |
| 15 | Area E (1997) L.915 B.9038.5 | Yellowish-brown ware (10YR 6/4), coarse, unevenly fired, organic inclusions, thumb impressions on ext. and a triangle-shaped handle. Rim D. 0.1 m. See Fig. 14.26: 5. |
| 16 | Area E (1996) L.470 B.4538.1 | Brown ware (7.5YR 4/4), coarse, many white grits and crushed quartz inclusions. Rim D. 0.25 m. See Fig. 14.24: 9. |
| 17 | Area A (2001) L.156 B.1166 | Red ware (10R 5/4), white inclusions, brown glaze on int. and glazed mark on ext. |
| 18 | Area A (2001) L.151 B.1145 | Red brown ware (10R 5/6), white pebbles and basalt inclusions. |
| 19 | Area A (2001) L.156 B.1166 | Red ware (10R 5/4), white grits and mica flakes. |
| 20 | Area K (200) L.703 B.7006 | Light brown ware (10R 7/3) coarse, with black core. |

## Containers

The term 'containers' is used here for vessels for transporting liquids or solids (storage jars, amphorae, flasks and small sphero-conical containers) and for vessels used for permanent storage (pithoi) or for a specific purpose (water-wheel pots). The most dominant type unearthed at Ateret was the Mamluk bag-shaped storage jar.

### 3A Storage Jars

*3A1. Mamluk Bag-Shaped Jars* (Fig. 14.11:4–7).
The jars of this group are made from a red/brown ware, relatively well levigated, containing many white and hard black grits. The vessel's neck is relatively high for a jar, more typical of an amphora neck. A prominent ridge is located just below the rim. The principal characteristic of the bag-shaped jar is that its maximum width is below the centre of the vessel: a shape that resembles a bag or a sack. The origin of this type lies in the 7th century BCE (Raban 1980: 83–87) and continues with variations through the millennia into modern times.

The shape (but not the ware) resembles examples from Jerusalem, Yoqne'am, Tel 'Arqa, St. Mary of Carmel and Firasin, where they were dated to the Mamluk occupation levels (Tushingham 1985: Figs. 42: 12, 43. 14; Avissar 1996: 153, Type 13; Hakimian and Salame'-Sarkis 1988: Fig. 16.3; Pringle 1984: Fig. 5:7 and Maharian 2000: Fig. 78: 9). A sub-type of this jar is a short-necked vessel (Fig. 14.11:5) made from the same ware as the others, examples of which were found at Firasin, Giv'at Yasaf and Yoqne'am, Safed, al-Waṭṭa Quarter (Maharian 2000: Fig. 78.7; Stern 1999: Fig. 4:49; Avissar 1996: 153, Type 14, Fig. XIII.121.2; Dalali-Amos and Getzov 2019: 45:12).

The Ateret Mamluk bag-shaped jar belongs to Avissar and Stern's Type II.3.1.4 (2005: 102). Parallels are known from and Khirbat Din'ila (Stern 2014: Fig. 5).

*3A2. Thick Everted-Rim Jar* (Fig. 14.11:1–3; 8).
Only three rims of this type were retrieved from the excavations. The jar is characterized by a hard-fired, dark red ware (2.5YR 4/8) and a thick everted rim, triangle in section. As in Type 3A1, the length of the neck resembles that of an amphora rather than a jar.

Such vessels were recorded at Yoqne'am and Tel 'Arqa, where they have been dated to the late 12th or early 13th century (Avissar 1996: 155, Type 18 and Hakimian and Salame'-Sarkis 1988: Fig. 13). No parallels were found for Fig. 14.11:8.

### 3B. Pithos (Fig. 14.11:9).

Thick rounded rim, no neck. Rope decoration below the rim. Similar but not identical pithoi were found in Safed, al-Waṭṭa Quarter (Dalali-Amos and Getzov 2019: 44:7).

### 3C. Amphorae (Fig. 14.11:10–11).

Only twenty rims were identified as belonging to amphorae. Most have a tall neck with two loop handles attached from the neck to the upper shoulder. They are all made of a red clay (2.5YR 5/6), finely levigated, containing small white grits. They are unevenly fired, leaving a greyish/brown core.

The prototype of this amphora, known from Caesarea, dates to the Fatimid period (Arnon 1999: 235). Similar items were recorded at Yoqne'am (Avissar 1996: 154, Type 18); Tel 'Arqa (Hakimian and Salame'-Sarkis 1988: Fig. 13, Pl.VII.12) and in Corinth (MacKay 1967: No. 59). They are dated to the 12th-13th centuries. The amphorae found at Ateret are described by Avissar and Stern, who dated them to the Mamluk period (Avissar and Stern 2005: Fig. 4:9–11)

**3D. Flasks (Fig. 14.11:12–13).**

Flask with rounded body and tall neck. The rim missing. Handles start from the base and stretch to the shoulder, characteristic of the Mamluk period. For late 12th-13th century references for one of the flasks (Fig. 14.11:12), see Avissar and Stern 2005: 117, Type 31; Tushingham 1985: Fig. 42:8; Saller 1957: Fig. 63.4511; de Vaux and Steve 1950: Pl. G34; and Stern 1997: 39, Fig. 4.18.

**3E. Sphero-Conical 'Greek Fire' Containers (Fig. 14.11:14–15).**

This special container is characterized by a sphero-conical shape and very thick walls. The opening is narrow, probably to prevent the contents from spilling out. Two main types have been identified: (1) plain rounded and (2) elongated and decorated. They were studied by Ettinghausen, who dated the first type to the Umayyad period (Ettinghausen 1965: 224) and the second to the late 12th-13th centuries. He suggested an explanation for the use of the vessel (1965: 226): they were used as "fire bombs," i.e., grenades, or for storing precious liquids (Wilkinson 1973: 293–294). The vessels found at the bathhouse in Hammat Gader probably contained precious liquids (Ben Arieh 1997: 380).

The vessels from Ateret (Fig. 14.11:14–15) belong to the second, elongated, type, and are densely decorated with various stamped or applied ornaments. Such types are common in 12th-13th century sites in North Syria, Palestine, Mesopotamia and Iran (Ettinghausen 1965: 218; Soustiel 1985: 132; Poulsen 1957: Figs. 1047–1055, Type DXXXI; Tushingham 1985: Figs. 45: 6–10, dated Mamluk). At Ateret they probably served as grenades.

**3F. Water-wheel (sāqiya) pots (Fig. 14.12:1–3).**

This type of pot, also known as a *zir* or *antiliya*, was used to draw water from a well; its shape was designed to fulfil this function. The pots were tied to a water-wheel by ropes that fit in a groove located at the lower part of the vessels. All the Ateret pots were made from sandy, gritty buff ware and consist of an elongated cylindrical bag-shaped body and a straight simple rim.

These pots appear over a long time span, from the Roman or even Hellenistic periods to the modern era (Ayalon 2000: 216, 219). The Ateret examples resemble Ayalon types dated to the Mamluk period (Ayalon 2000: 224, Fig. 6). The date is derived from the site of Niṣṣanim, where they were found alongside a coin hoard dated to that period (Ayalon 2000: 224, fn. 23).

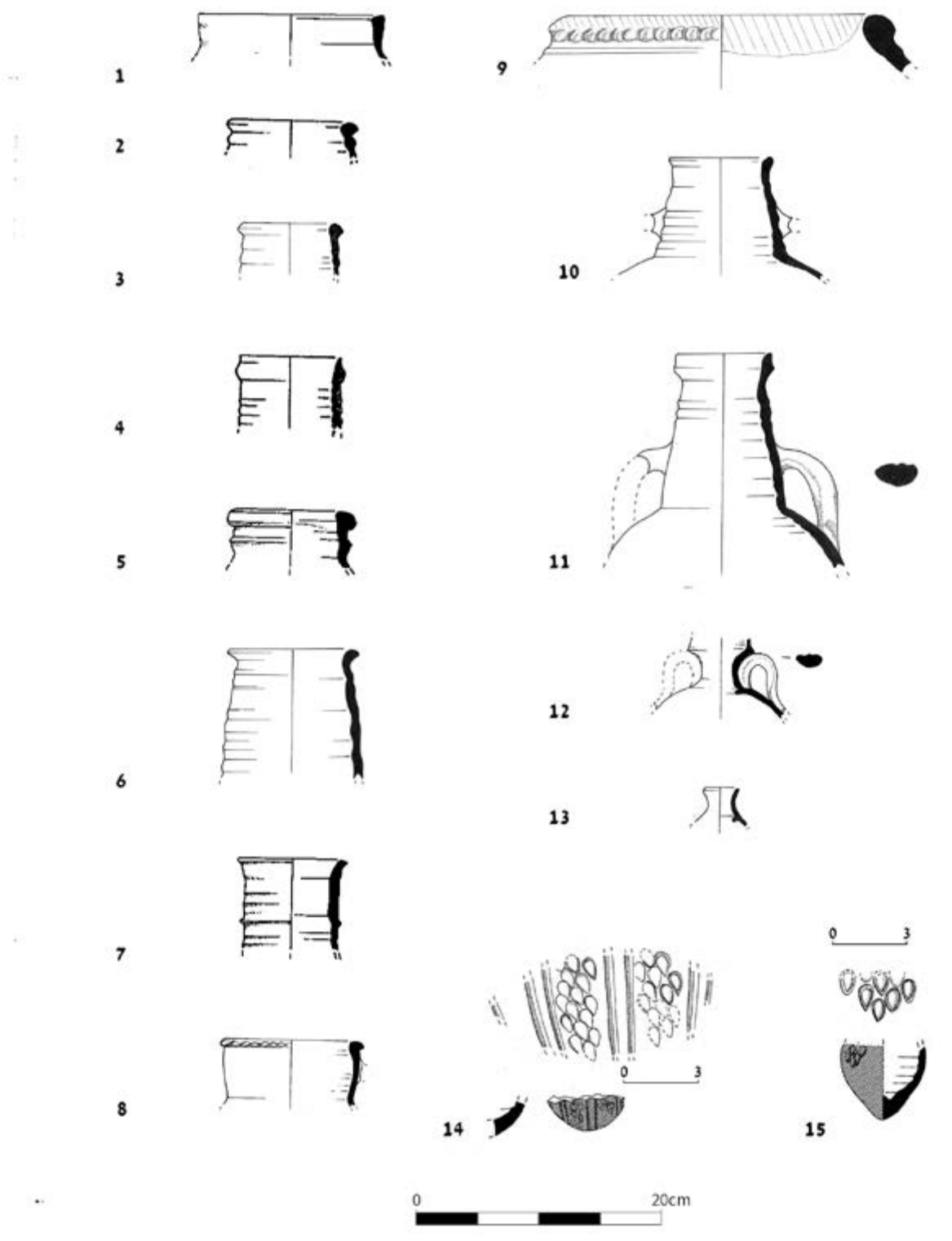



**Figure 14.11**. Containers (Types 3A-3E).

**Figure 14.11**. Containers (Types 3A-3E).

| NO. | AREA (YEAR)<br>LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area F (1994) L.901 B.9006 | Dark brown ware (7.5YR 4/4), many crushed quartz inclusions, medium white grits, mica and basalt. |
| 2 | Area B (1993) L.305 B.3024.3 | Red ware (10R 5/8), well-thrown, unevenly fired, white grits and foliates of a shiny mineral (gypsum or schist?). Rim D. 0.12 m. See Fig. 14.20:13. |
| 3 | Area B (1993) L.305 B.3011.3 | Red ware (2.5YR 4/8), well-thrown and fired. Rim D. 0.1 m. See Fig. 14.18:12. |
| 4 | Area B (1993) L.305 B.3011.4 | Red ware (2.5YR 4/8), well-thrown, well-fired, crushed seashells or snail shells. Rim D. 0.1 m. See Fig. 14.18:5. |
| 5 | Area F (1994) L.901 B.9006 | Light red-pink ware (7.5YR 7/4), many white and hard black grits. |
| 6 | Area E (1997) L.930 B.9061.1 | Red ware (2.5YR 5/6), well-thrown, fired to a buff hue (2.5Y 7/3, many white grits, soot remains on ext. Rim D. 0.1 m. See Fig. 14.25:8. |
| 7 | Area B (1994) L.371 B.3571 | Light yellowish-brown ware (10YR 6/4), many white grits and quartz inclusions. |
| 8 | Area B (1993) L.305 B.3024.6 | Red ware (10R 5/8), well-thrown, crushed shells. Rim D. 0.125 m. See Fig. 14.18:7. |
| 9 | Area E (1995) L.514 B.5077.1 | Light brown-pink ware (5YR 7/4), handmade, coarse, white and hard black grits, yellowish slip on int. and ext. under a red painted band on rim. Rim D. 0.25 m. See Fig. 14.26:7. |
| 10 | Area E (1995) L.529 B.5158.1 | Red ware (2.5YR 5/6), well-thrown, unevenly fired (dark brown core), porous, small to large white grits, white-washed on upper part near rim. Rim D. 0.08 m. See Fig. 14.23:16. |
| 11 | Area B (1993) L.302 B.3028.1 | Red ware well-thrown, unevenly fired. Rim D. 0.075 m, neck H. 0.125 m. See Fig. 14.17:13. |
| 12 | Area B (1993) L.305 B.3011.2 | Red ware (2.5YR 5/6), well-thrown, black and white grits and shell inclusions. See Fig. 14.18:6. |
| 13 | Area E (1997) L.925 B.9054 | Red ware (10R 5/8), dark brown glaze on int. and ext. |
| 14 | Area H (1994) L.406 B.4009 | Dark grey ware, well-thrown, hard fired to a purplish brown hue (10R 3/3), stamp decorated. |
| 15 | Area C?<br>L.581 B. 0003 | As No. 14. |

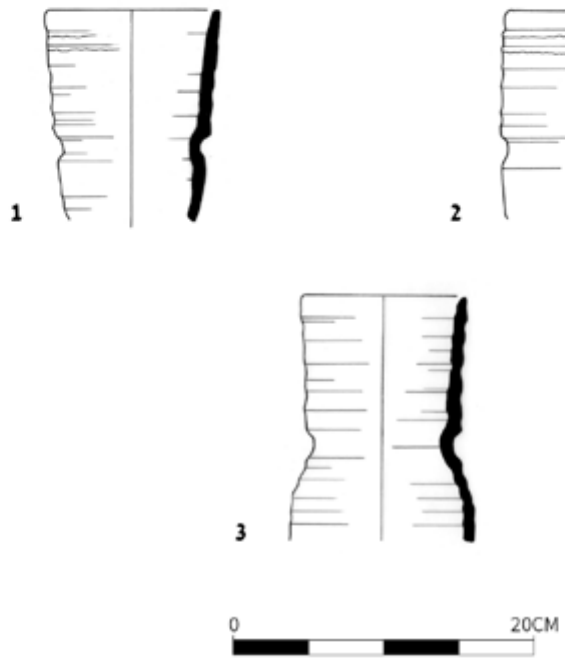



**Figure 14.12**. Water-Wheel (Sāqiya) Pots (Type 3F).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area E (2000) L.500 B.5000 | Greenish buff ware, simple rim. |
| 2 | Area E (2000) L.500 B.5000.2 | As No. 1. |
| 3 | Area A (1993) L.104 B.1022 | As No. 1. |

## Ottoman Pottery

**4A. Handmade Brazier (Fig. 14.13:1).**

This handmade brazier was produced from the same fabric as the handmade bowls and jugs discussed above (Types 1Aa and 1Ab). It is decorated with the same technique — red geometric patterns under a pinkish slip. Considering the production and decoration techniques, one might consider a late 12th-13th century date.

**4B. Tobacco Pipes (Fig. 14.13:2–5).**

All the pipes from Vadum Iacob are mould-made in grey clay, finely levigated and hard fired at a relatively high temperature. They are covered with a red-brown slip and decorated with pinched dots (Fig. 14.13:5).

They belong to Ramat Hanadiv Type 3 (Boas 2000: 557), which consists of a short shank and is dated to the 19th century. A detailed study was carried out at Banias, where the 18th century is the suggested date for this type (Dekel 2008: Fig. 4.9:46). Similar pipes were found in Yoqne'am, 'Akko, Zefat, Ramla and Jerusalem (Avissar 1996: 198; Edelstein and Avissar 1997: Fig. 2; Barbé and Cinamon 2009: Fig. 1; and de Vincenz 2011: 44). These tobacco pipes are dated to the 18th-19th centuries (Avissar 1996: 198; Robinson 1983: 269; Ben Dov 1982: 364; Stern 1997: 68 and Hayes 1992: 391–395).

**4C. Ottoman period pottery (Fig. 14.13:6–9).**

Due to the importance of this poorly documented group, we decided to include these two late vessels in the medieval pottery assemblage. The unglazed vessels were made from grey clay or fired to a grey hue in a reduced atmosphere. The fabric was relatively coarse and contains many white grits in various sizes. The vessels were smoothed or trimmed with a sharp tool while leather hard.

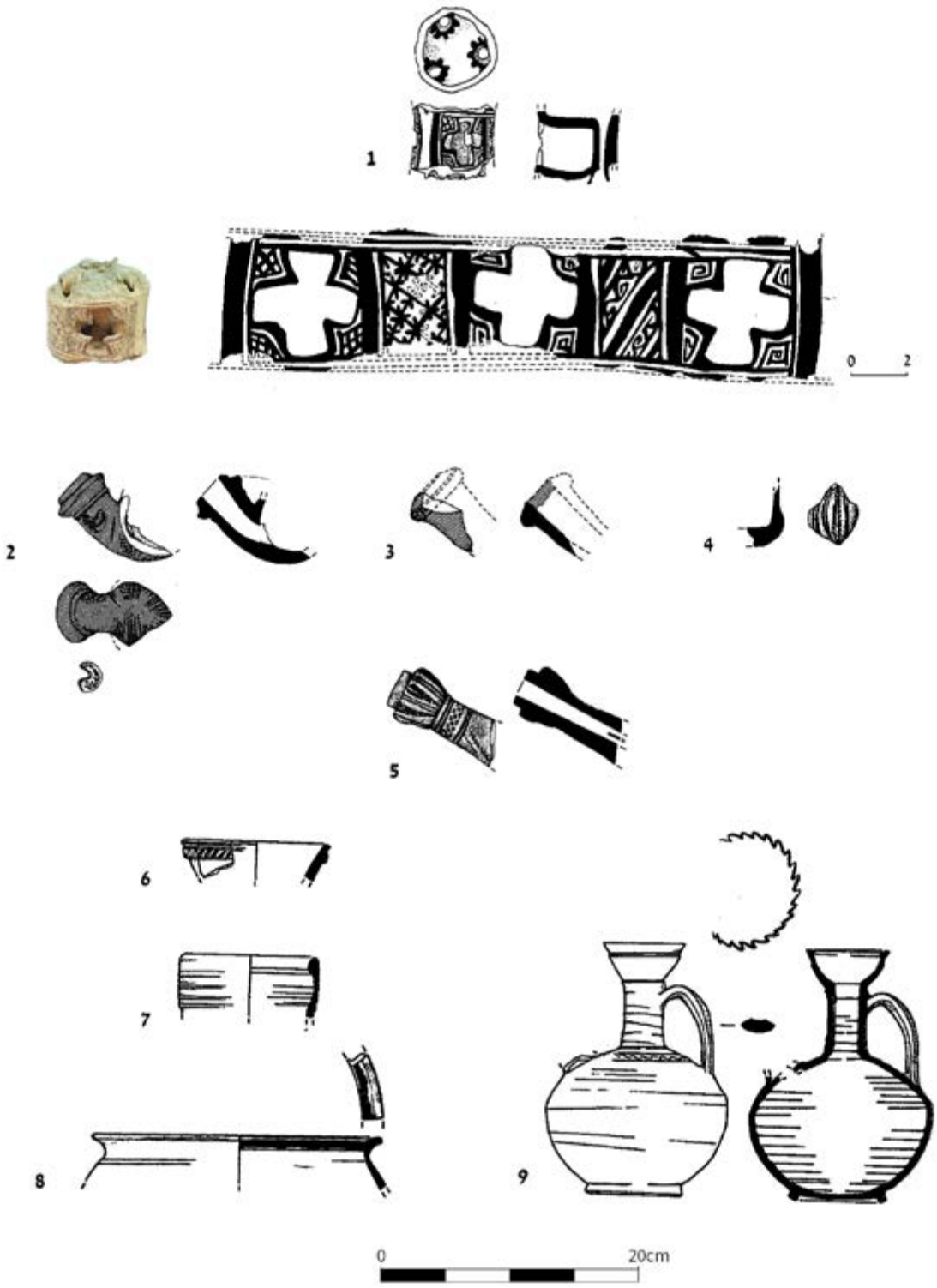



**Figure 14.13**. Ottoman Pottery

**Figure 14.13**. Ottoman Pottery (Types 4A-4C).

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area C (1994) L.555 B.5528 | Grey ware, handmade, coarse, pinkish slip under red geometric decorations. |
| 2 | Area E (1994) L.857 B.8510 | Grey ware, well-thrown, hard fired to a purplish hue (10R 4/4), burnished on ext. |
| 3 | Area H (1994) L.408 B.4016.1 | As No. 2. |
| 4 | Area H (1994) L.406 B.4008 | As No. 2. |
| 5 | Area H (1994) L.408 B.4016.2 | Fired to a dark grey hue. |
| 6 | Area E (1994) L.860 B.8521 | Grey ware (5Y 5/1), handmade, coarse, white grits and crushed grog. |
| 7 | Area H (1994) L.407 B.4003.1 | Grey ware (5Y 5/1). |
| 8 | Area H (1994) L.407 B.4003.2 | Red ware (10R 5/8), dark brown glaze. |
| 9 | L.? B.? | Red ware (10R 5/6), unevenly fired to a grey hue, ext. The surface trimmed by a sharp tool. |

**Figure 14.14.** Handmade Brazier

# OIL LAMPS

## 5A. Unglazed Lamps

*5A1. Wheel-made Saucer-Shaped Lamp* (Fig. 14.15:7, 9, 12).

This wheel-made lamp is characterized by its unique shape, which is produced from two separate parts. The bottom part resembles a saucer, pinched at the edge to form a nozzle and a string-cut, slightly convex base. The upper part is globular, containing a large filling hole surrounded by a shallow ring, and was placed on the saucer like a lid on a cup. A loop handle stretches from the filling hole to the saucer. The ware is usually brick-red, resembling the clay used in cooking pots.

The origin of the lamp lies in the 10th-11th century Fatimid period. The later oil lamps, which the lamps found at Ateret belong to, are of a finer craftsmanship. They are usually smaller and their walls thinner (Arnon 2008b: Fig. 32). These types of oil lamps are well known in Crusader occupation levels dated to the 12th-13th centuries. Similar lamps were found at Tel ʻArqa, Baalbek, Yoqneʻam, Caesarea, Atlit, Jerusalem and St. Mary of Carmel (Thalmann 1978:28; Kohl 1925: abb 63; Avissar 1996:196; Arnon 2008b; Brosh 1986: Figs. 5.13–15; Johns 1934:144; Tushingham 1985: Fig. 35.41; and Pringle 1984: Fig. 7.39). Avissar and Stern dated this lamp to the Crusader period: the late 12th–early 13th centuries (Avissar and Stern 2005: 124, Fig. 52.1).

## 5B. Glazed Lamps

*5B1. Glazed Wheel-made Saucer-Shaped lamp* (Fig. 14.15:1, 11).

This lamp is a glazed version of Type 5A1, see above. The only difference is the thick lead glaze, coloured green or yellow, which was applied directly on the lamp. Although dated by Kubiak to the 10th-11th centuries (Kubiak 1970: 9–10, Type E), it seems that an 11th-13th century date given by Kennedy, and the data provide from the sites mentioned above, is more accurate (Kennedy 1963: 91, Type 25). A 12th century date was given for these lamps found in Raqqa, Syria (Milwright 2005: Fig. 8).

*5B2. Open Glazed Wheel-made Saucer-Shaped Lamp* (Fig. 14.15:2–3, 8).

There is a similarity between Type 5B1, see above, and Type 5B2. Although Waage', in his study, classifies them in the same category (Waage' 1941: 68), it seems that there are enough differences to classify this group as a separate type here. This wheel-made lamp is made from two separate parts, as Type 5B1, but the upper part is much smaller. The loop handle is attached to the filling hole but extends only onto the saucer rim. All the lamps found at Ateret were manufactured from red clay, finely levigated. They have a transparent, green, or yellow lead glaze. The lamp in Fig. 14.15:8 has a white slip under a yellow glaze.

This lamp corresponds to Kubiak Type J (Kubiak 1970a:15), Broneer Type XXV (Broneer 1930: Pl. XXIV; 1543, 1530), and Waage' Type 58b–e (Waage' 1941: 68). It was also reported in Baalbek (Kohl 1925: abb. 61); Hama (Poulsen 1957:1064–1066); Bethany (Saller 1957: Pl. 109.33); St. Mary of Carmel (Pringle 1984: Fig. 7.39); Hammat Gader (Cohen Uzzielli 1997: Pl. XI.2); and Qasar al-Hayr (Grabar 1978: E-1.2).

Notwithstanding Broneer's dating to the 10th century (Broneer 1930: 124), the stratigraphical sequence at Caesarea, along with the data from Hama, Bethany, Fustat and Mount Carmel, indicates a 13th-14th century date for this type.

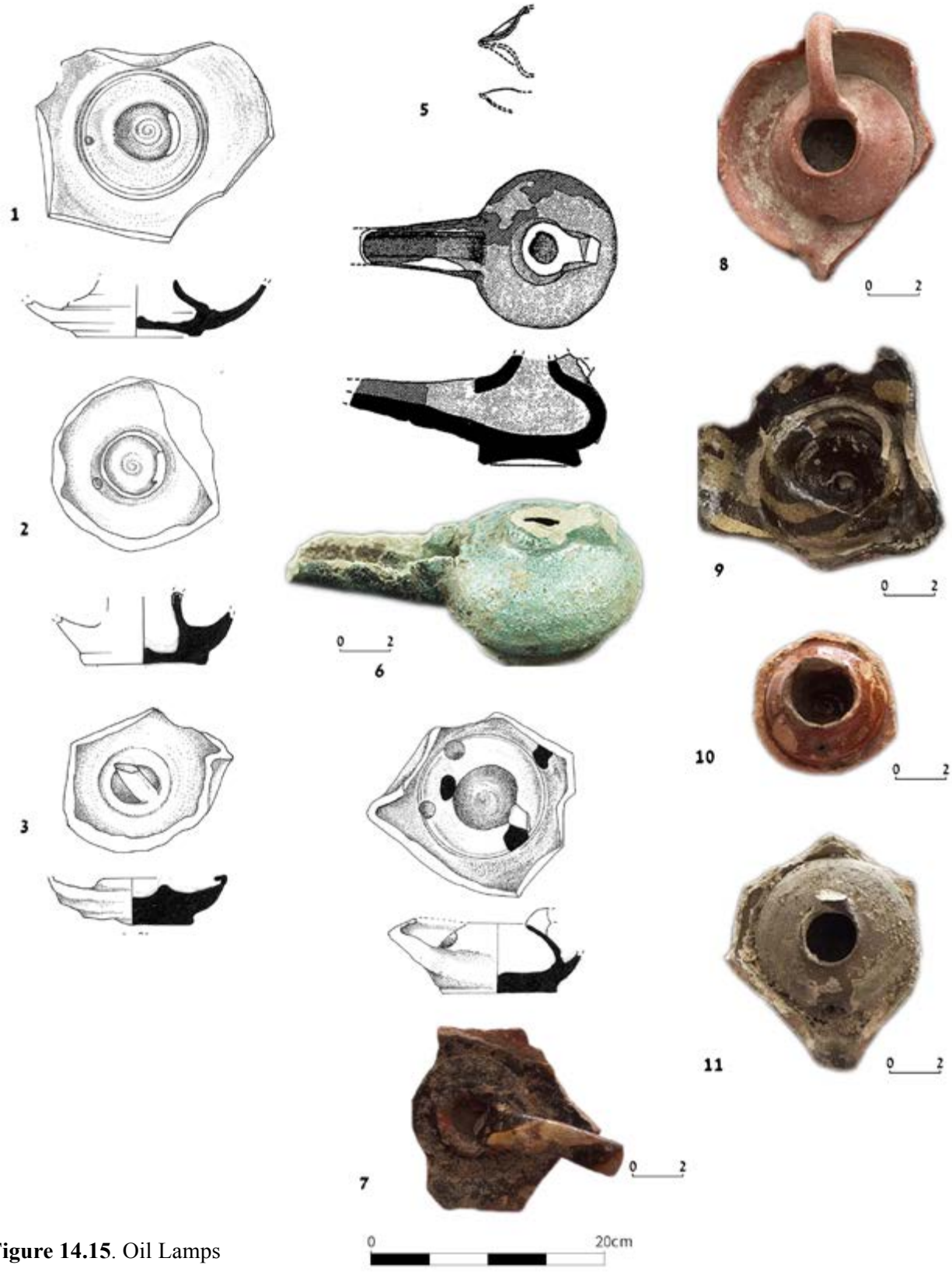



**Figure 14.15**. Oil Lamps

**Figure 14.15**. Oil Lamps (Types 5A1–5B5)

| NO. | AREA (YEAR) LOCUS BASKET | DESCRIPTION |
|---|---|---|
| 1 | Area E (1996) L.451 B.4501.1 | Red-yellow orange ware (5YR 7/8). |
| 2 | Area E (1995) L.508.B.5031.1 | Ware as No. 1, white slip on int. and partially on ext. under a shiny green glaze. |
| 3 | Area E (1997) L.925 B.9049.1 | Dark brown ware, white slip on int. under a yellow glaze, yellow glaze drips on ext. |
| 4 | Area G (1994) L.200 B.2006 | Light red ware, white slip painted under a yellow glaze. Not illustrated. |
| 5 | Area B (1993) L.305 3041 | Red ware (10R 5/8), fired to a grey hue, hard black grits, white slip painted under a yellow/green glaze. |
| 6 | Area B (1994) L.371. B.3571 | Greyish ware (10YR 7/1), covered by a turquoise glaze and red stains, due to the high temperature in the kiln. |
| 7 | Area E (1995) L.529. B.5147 | Red ware (10R 4/6), white grits. See Fig. 14.23: 7. |
| 8 | Area E (2005) L. 220. B.2030 | Red ware (10R 4/6) white grits. Slip painted glazed in yellow and brown under a transparent glaze. |
| 9 | Area A (2001) L.156. B.1173 | Red ware (10R 4/6), finely made. |
| 10 | Area A (2002) L.114. B.1056 | Dark grey ware (2.5YR 4/1), painted yellow slip under a transparent glaze. |
| 11 | Area E (2000) L. 701 B.7005 | Pale red ware (10R 6/4). Brown glazed with signs of yellow slip painted glaze. |
| 12 | Area A (2001) L.150. B.1165 | Grey coarse ware. |

**Figure 14.16.** Glazed wheel-made juglet form lamp

*5B3. Pinched Glazed Wheel-made Saucer-Shaped Lamp with a Socket* (Fig. 14.15:4).

This type is similar in shape to Type 5B2 above, with one exception the filling hole is. The ware is light red, finely levigated. The entire lamp is covered with a white slip under a thick yellow lead glaze.

No parallels were found. Since this lamp was found in fills it was dated according to its shape and decorative style to the 13th-14th centuries.

*5B4. Pinched Glazed Wheel-made Saucer-Shaped Lamp* (Fig. 14.15:5).

Type 5B4 is characterized by a relatively deep saucer, a folded rim pinched at the edge and a string-cut flat base. The Ateret lamps of this type were made from red ware (10R 5/8), finely levigated, containing white and hard black grits, probably basalt, which might indicate a local workshop. They are coated with white slip painted under a yellowish/green lead glaze; some have a transparent glaze.

In Caesarea such lamps are exclusive to Stratum II, dated to the 13th century (Arnon 2008b). The same date was given in Bethany, Abu Gosh, Hama, Fustat, Qasr al-Hayr, Baalbek and Antioch (Saller 1957: Pl. 109.34; de Vaux and Steve 1950: 143, Fig. 34; Poulsen 1957: Fig. 1086; Kubiak 1970: Type L, Fig. 14a–b; Grabar 1978: Fig. 169.7; Kohl 1925: abb.81; and Waage' 1941: 68, Type 59.186). Avissar and Stern dated this type to the Mamluk period (Avissar and Stern 2005: Fig. 53:5).

*5B5 Glazed Wheel-made Juglet Form Lamp* (Fig. 14.15:6).

This wheel-made lamp has a spheroid juglet form with a low ring base, slightly concave with a long rectangular nozzle (in section) and a loop handle stretching from the middle of the neck to the globular body. Type 5B5 corresponds to Kubiak Type I, dated to the 12th-15th centuries (Kubiak 1970: 13–14, Fig. 11a–b), with its origin lying in the Fatimid culture. The specimen found here is covered with a thick turquoise glaze containing red stains, due to the high temperature in the kiln during the second firing. Such damage during the production process might indicate a local product rather than an import.

Although in Caesarea a similar type was dated to the 11th-12th centuries (Arnon 2008a: 258–259). In Yoqne'am and Tel 'Arqa it is dated exclusively to the Crusader period: the 12th-13th centuries (Avissar 1996: 195–196 and Thalmann 1978: Fig. 37. 4).

## Discussion and Conclusions

About 3,000 diagnostic shards were unearthed during the four seasons of excavations at Vadum Iacob. Of these 63.23% were tableware (Types 1Aa-1Ac and 1Ba-1Be), 12.4% were containers (Types 3A-3E), 6% were basins (Type 1Ad), 16.18% were cooking wares (Types 2A-2B) and 2.36% were oil lamps (Type 5A-5B) (Fig.14.1). Such a distribution attests to domestic occupation. Most of the vessels were probably made locally, except for a few fragments of imported wares such as St. Symeon ware (see Type 1Bc), Frit Ware (Type 1Bf) and Lustre Ware (Type 1Bg). The chronological spectrum represented in this report ranges from the late 12th to early 13th century with a small collection that dates to the Ottoman period.

The comparison between the ceramic types that appear in the two main horizons — the late 12th century (Table 14.1) and the late 13th-14th century (Table 14.2) —revealed the following:

**Table 14.1.** Types that appear in the construction deposits.

| TYPES | FIGURES |
|---|---|
| TABLE WARE | |
| Plates with a "S" shaped profile or a ledge rim | 14.5:8, 14.20:4, 14.22:2, 5, 14.23:1–4, 14.24:2–3, 14.26:8 |
| Handmade painted decorated jugs | 14.19:5–6, 10, 14.23:15 |
| Buff ware strainers | 14.28:10 |
| All the glazed wares: monochrome with/without sgraffito decorations, colour plash glazed with/without sgraffito, under glazed slip painted, and Frit Ware | 14.18:7–9, 14.21:2, 5, 14.22:1–3, 14.21:8–11 |
| CONTAINERS | |
| Amphorae | 14.23:16, 14.25:8 |
| COOKING WARES | |
| Wheelmade glazed cooking pots | 14.19:2–3, 14.23:14 |
| Wheelmade frying pans | 14.22:4, 14.23:13 |
| OIL LAMPS | |
| Saucer-shaped oil lamps, glazed and unglazed | 14.23:7 |

**Table 14.2.** Types that relate to the Mamluk Village.

| TYPES | FIGURES |
|---|---|
| TABLE WARE | |
| Carinated bowls | 14.17:1–2, 7, 14.18:1–3 |
| All the glazed wares except Frit Ware | 14.17:1–2, 7–8, 11–12, 14.18:1–4 |
| Handmade painted jugs | 14.17:6, 10, 14.26: 6 |
| CONTAINERS | |
| Mamluk bag-shaped jars | 14.18:5, 12–13 |
| Amphora | 14.17:13 |
| COOKING WARES | |
| Handmade cooking ware | 14.26:5 |

In conclusion, "S" shaped plates and bowls are found only in the construction deposits, as are Frit Ware (Type 1Bf), the buff ware strainer (Type 1Ac) and amphorae (Type 3C). It is interesting that not even a single handmade cooking vessel was revealed in these deposits. Yet the handmade painted jugs, which usually belong to the Mamluk period (Type 1Ab) made their first appearance in the late 12$^{th}$ century, i.e., during the construction phase.

On the other hand, carinated bowls, handmade cooking ware, basins, bag-shaped storage jars, and oil lamps (Types 5B2, 5B3 and 5B4) distinguish the Mamluk deposits.

The glazing technique in both deposits is similar. Except for the Lustre and Frit Ware, all are lead glazed and only the vessel's shape can be used as a guiding fossil.

An interesting find is the presence of water-wheel jugs (Type 3f, Fig. 14.12) that were found in the fortress. Such a discovery might indicate the presence of a well on top of the hill, despite the proximity to the Jordan River. While both a well and a water cistern are mentioned in the sources, neither was found during the excavations. And yet, the water-wheel jugs provide the strongest evidence for the existence of a water supply within the fortress walls themselves

## The Stratigraphic Sequence

As mentioned above, the main objective of the pottery analysis is to elucidate the typologies of (a) the well-dated construction phase of the late 12th century and (b) that of the Mamluk occupation level. The two assemblages were compared to find "guiding fossil" types to these periods. Thirty sealed and significant loci from Areas E, B, C and A were selected to represent various ceramic types. Twenty loci were identified as representing the construction phase and ten associated with the Mamluk village (Figs. 14.17–14.29).

### The Late 12th Century Deposits

Area E (1997) L.918: an ash layer in the large oven (Fig. 14.19).

Area E (1997) L.930: burnt layer (Fig. 14.25).

Area E (1996) L.467: a floor (Fig. 14.19).

Area E (1996) L.470: under Floor 467 (Fig. 14.24).

Area E (1996) L.458: fill above floor 460 (Fig. 14.22).

Area E (1995) L.520: floor with coins dated to 1163–1174 and 1178–1179 (Fig. 14.21–14.22).

Area E (1995) L.532: fill under Floor 520 (Fig. 14.22).

Area E (1995) L.519: floor (Fig. 14.22).

Area E (1995) L.529: fill under Floor 519 (Fig. 14.23).

Area E (1995) L.526: floor with coins dated to 1163–1174 (Fig. 14.24).

Area E (1995) L.521: fill above Floor 527 (Fig. 14.26).

Area E (1994) L.873: battle occupation layer (Figs. 14.20–14.21).

Area E (1994) L.868: as Locus 930 (Fig. 14.25).

Area E (1994) L.856: gate floor (Fig. 14.21).

Area A (1997) L.712: fill under stone debris (Fig. 14.29)

Area A (1996) L.262: fill under locus 252 (see Fig. 14.28).

Area A (1996) L.252: occupation layer under debris with a coin dated 1163–1174 (Fig. 14.27).

Area A (1996) L.703: removing the collapse south of the northern curtain wall (Fig. 14.29)

Area A (1995) L.711: floor south of the northern curtain wall (Fig. 14.29).

Area A (1995) L.713: fill between floor's south of the northern curtain wall (Fig. 14.29).

Area C (1993) L.507: floor (Fig. 14.29).

Area C (1994) L.555: occupation layer by the gate (Fig. 14.28).

### The Mamluk Village Deposits

Area E (1997) L.915: lime fill above ash layer above Floor 921 (Fig. 14.26).

Area E (1996) L.456: floor (Fig. 14.25).

Area E (1996) L.458: fill above floor 460 (Fig. 14.22).

Area E (1995) L.514: fill under Floor 512 (Fig. 14.26).

Area A (1997) L.703: below collapse south of the northern curtain wall (Fig. 14.29).

Area A (1996) L.152: mosque floor (Fig. 14.27).

Area A (1996) L.253: fill under mosque floor (Fig. 14.27).

Area A (1994) L.110: occupation level (Fig. 14.28).

Area B (1994) L.372: occupation layer with Ayyubid and Mamluk coins (Fig. 14.25).

Area B (1993) L.302: floor (Fig. 14.17).

Area B (1993) L.307: fill under Floor 302 (Fig. 14.17).

Area B (1993) L.305: floor (Fig. 14.18).

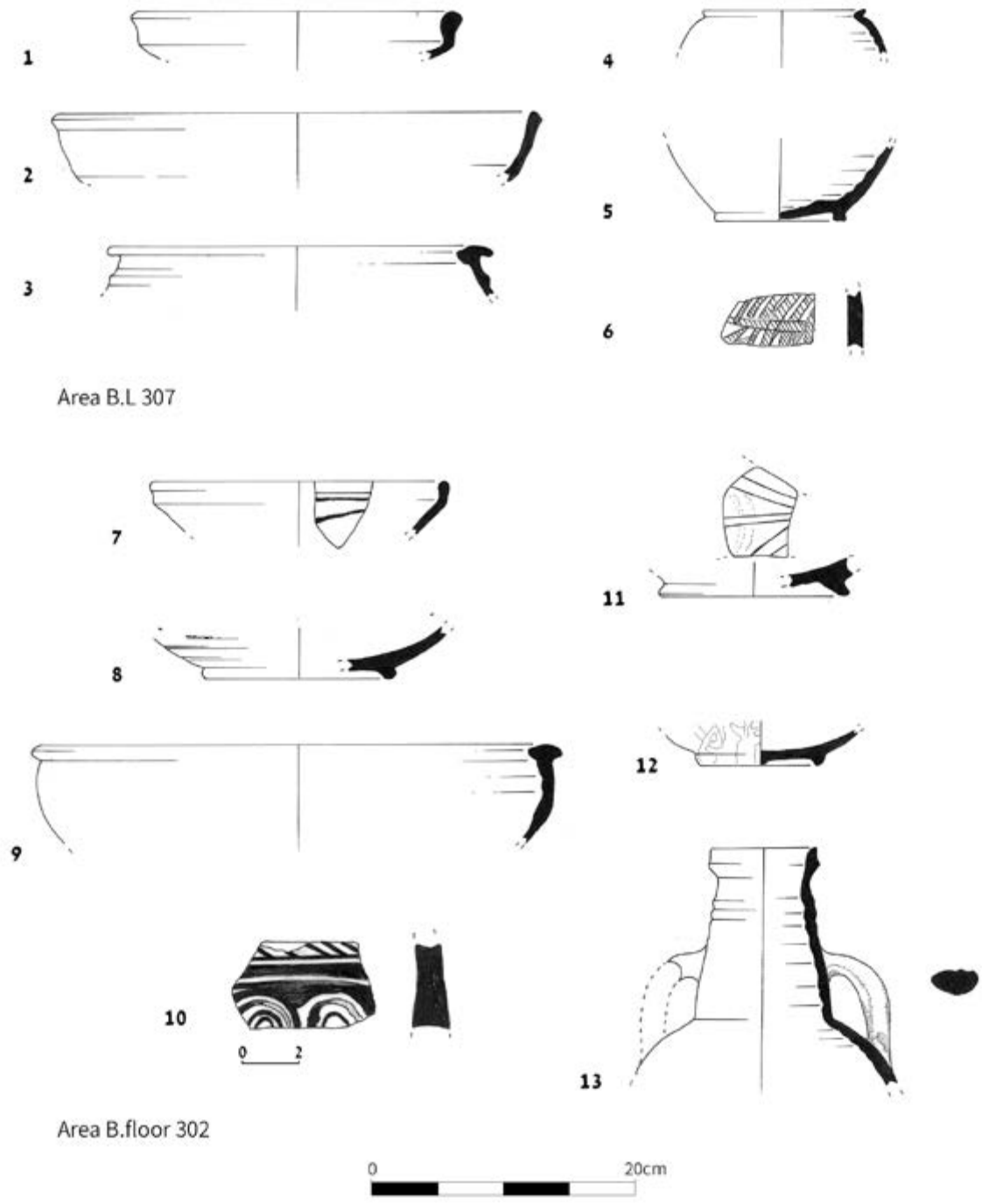



**Figure 14.17**.

**Figure 14.17**. 1–6: Area B, Locus 307, fill under Floor 302; 7–13: Area B, Locus 302, floor.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 3041.003 | 1Ba | Light red ware (2.5YR 6/8), well-thrown, white slip on int. and ext. under a green lead glaze. Rim D. 0.225 m. |
| 2 | 3041.001 | 1Ba | Orange/light red ware (2.5YR 6/8), well-thrown, crushed sea shells or snail shells, white slip on int. and ext. under a shiny green glaze on int. only. Rim D. 0.35 m. |
| 3 | 3041.002 | 2B2 | Red ware (2.5YR 5/8), coarse, dark brown glaze on the rim. Rim D. 0.25 m. See Fig. 14.10: 13. |
| 4 | 3018.002 | 2B2 | Red ware (10R 5/8), well-thrown, dark brown glaze on rim. Rim D. 0.125 m. See Fig. 14.10: 10. |
| 5 | 3018.001 | Jug base | Red ware (2.5YR 5/8), well-thrown, unevenly fired (yellowish core), white slip on int. Base D. 0.1 m. Crusader (Stern 1997: 39, Fig. 4. 15). |
| 6 | 3041.004 | 1Ab | Reddish yellow ware (5YR 6/6), coarse, unevenly fired, no slip, geometric patterns in red/ brown paint on the ext. |
| 7 | 3009.002 | 1Bc | Light red ware (2.5YR 6/8), finely levigated, white slip on int. and ext. under yellow and green glaze, sgraffito on int. only. Rim D. 0.224 m. |
| 8 | 3002.003 | 1Ba | Light red ware (2.5YR 6/8), well-thrown, white slip under a green glaze on int. only. Base D. 0.15 m. |
| 9 | 3009.001 | 1Ad | Red ware, well-thrown and fired, white and hard black grits. Rim D. 0.375 m. See Fig. 14.4: 4. |
| 10 | 3002.001 | 1Ab | Light red ware (10YR 7/4), coarse, white slip on ext. under a geometric painted pattern in red and brown. |
| 11 | 3009.003 | 1Bd | Pinkish/light red ware (2.5YR 6/6), fired to a reddish brown hue (5YR 4/3), well-thrown, white slip under a greenish/yellow glaze. Base D. 0.125 m. |
| 12 | 3002.002 | 1Ba | Pink ware (5YR 7/4), porous and brittle, white slip on int. only under a yellow lead glaze. Base D. 0.09 m. |
| 13 | 3028.001 | 3C | Light red ware (2.5YR 6/8), well-thrown, unevenly fired. Rim D. 0.075 m, neck H. 0.125 m. See Fig. 14.11: 11. |

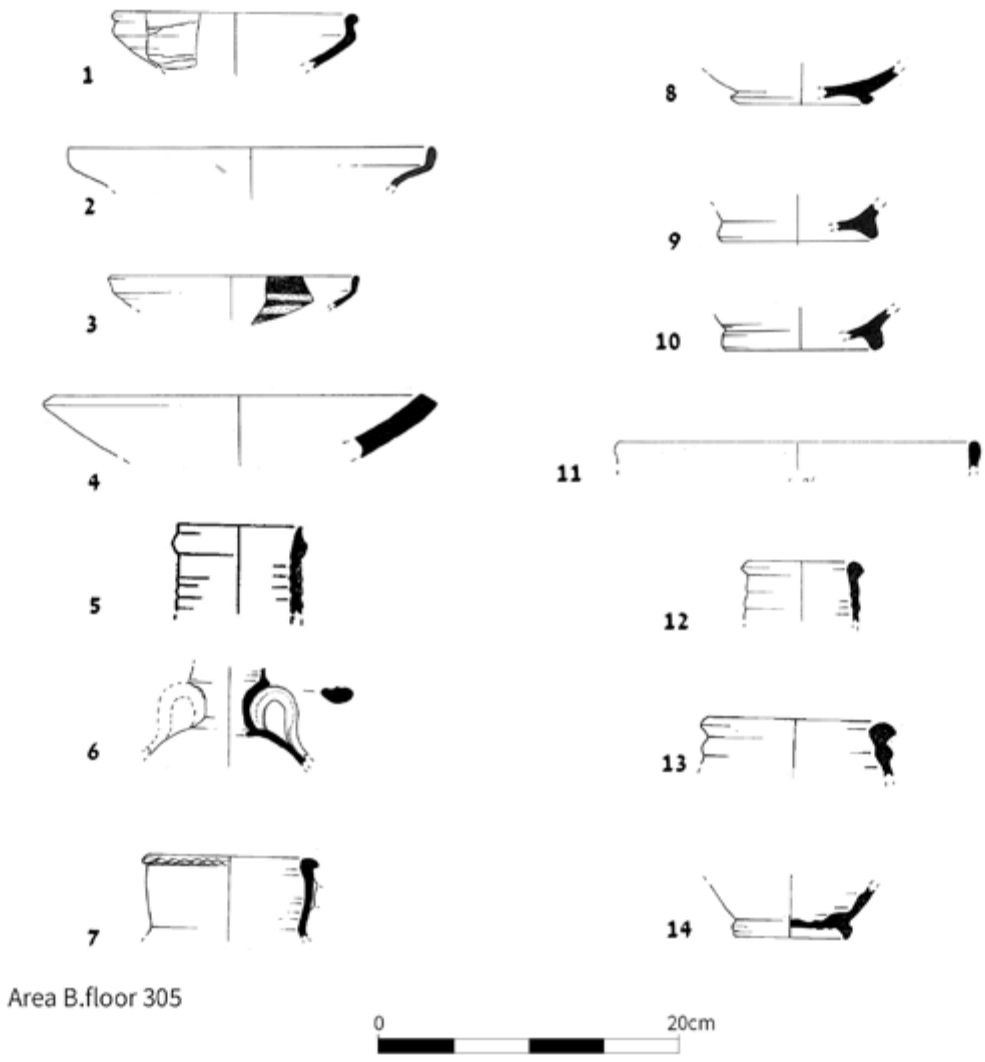



**Figure 14.18**

**Figure 14.18** Area B, Locus 305, floor.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 3020.002 | 1Ba | Light red–pink ware (5YR 7/4), white slip on int. and ext. near the rim under a shiny green glaze. Rim D. 0.25 m. |
| 2 | 3024.001 | 1Ba | Red ware (10R 5/6), well-thrown, white slip on int. and ext. near the rim under a shiny yellow glaze. Rim D. 0.25 m. |
| 3 | 3024.004 | 1Bd | Red ware (10R 5/8), well-thrown, white paint under a yellow glaze. Rim D. 0.225 m. |
| 4 | 3024.005 | 1Aa | Light brown–pink ware (7.5YR 7/3), coarse, unevenly fired (grey core). Rim D. 0.13 m. |
| 5 | 3011.004 | 3A1 | Dark red ware (2.5YR 4/8), well-thrown, well-fired, crushed sea shells or snail shells. Rim D. 0.1 m. See Fig, 14.11: 4. |
| 6 | 3011.002 | 3D | Red ware (2.5YR 5/6), well-thrown, black and white grits and shell inclusions. See Fig. 14.11:12. |
| 7 | 3024.006 | 3A1 | Red ware (10R 5/8), well-thrown, crushed shells. Rim D. 0.125 m. See Fig. 14.11: 8. |
| 8 | 3019.002 | 1Ba | Light red ware (2.5YR 6/8), well-thrown, white slip on int. only under a shiny yellow glaze. Base D. 0.12 m. |
| 9 | 3024.002 | 1Bf | Buff ware (2.5Y 7/3), porous and brittle, white slip on int. and ext. under an alkaline turquoise glaze. Base D. 0.1 m. |
| 10 | 3020.001 | Unglazed bowl base | Red ware (10R 5/8), well-thrown. Base D. 0.1 m. See Avissar 1996: 124, Type 14; Bagatti 1947: 127. |
| 11 | 3019.001 | 1Ba | Light red ware (2.5YR 6/8), well-thrown, white slip on int. and ext. near the rim under a green glaze. Rim D. 0.325 m. |
| 12 | 3011.003 | 3A1 | Red ware (2.5YR 4/8), well-thrown and fired. Rim D. 0.1 m. See Fig. 14.11: 3. |
| 13 | 3024.003 | 3A1 | Red ware (10R 5/8), well-thrown, unevenly fired, white grits and foliates of a shiny mineral (gypsum or schist?). Rim D. 0.12 m. See Fig. 14.11: 2. |
| 14 | 3011.001 | Jug base | Red ware (10R 5/8), well-thrown, many crushed sea shells or snail shells. Base D. 0.1 m. |

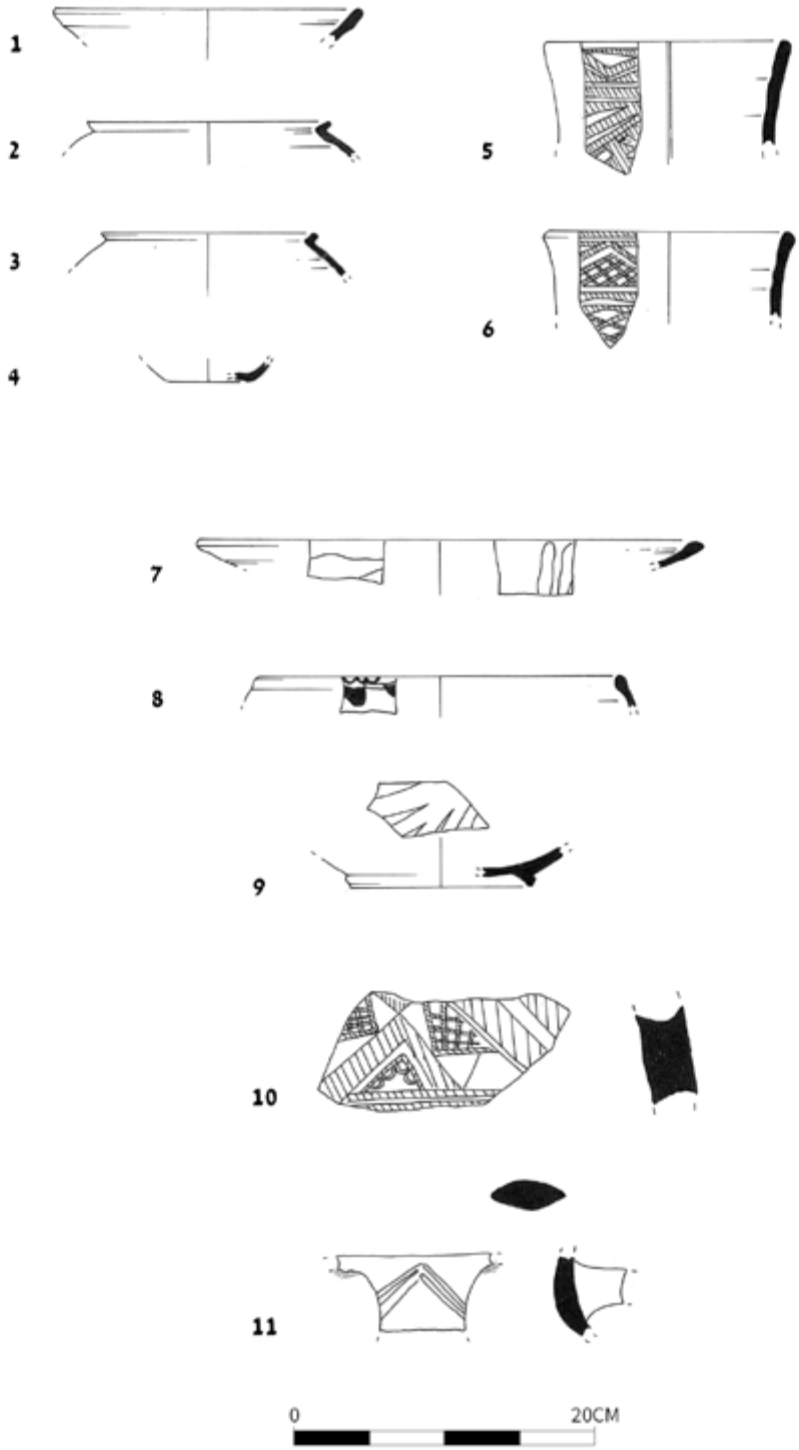



**Figure 14.19.**

**Figure 14.19.** 1–6: Area E, Locus 918: Ash layer under a dismantled vault. 7–11. Area E, Locus 467, floor.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 9041.004 | 1Bd | Red ware (2.5YR 4/8), well-thrown and fired, white paint under a yellow glaze. Rim D. 0.2 m. |
| 2 | 9041.003 | 2B2 | Red ware (10R 5/8), well-thrown, remnants of dark brown glaze on the int. Rim D. 0.15 m. |
| 3 | 9041.005 | 2B2 | Red ware (10R 5/8), well-thrown, dark brown glaze fired to a grey hue in a reduced atmosphere. Rim D. 0.145 m. |
| 4 | 9041.006 | 2B2 | Red ware (10R 5/8), well-thrown, dark brown glaze on int. |
| 5 | 9041.002 | 1Ab | Light brown ware (10YR 7/4), coarse, orange slip under a red/brown painted decoration. Rim D. 0.15 m. |
| 6 | 9041.001 | 1Ab | As No. 5. |
| 7 | 4534.002 | 1Bd | Light red ware (2.5YR 6/6), well-thrown, white painted decoration under a yellow lead glaze. Rim D. 0.34 m. |
| 8 | 4534.003 | 1Ba | Red ware (10R 5/8), well-thrown, white slip on int and ext. near the rim under a lead green glaze. Rim D. 0.25 m. |
| 9 | 4534.001 | 1Bd | Red ware (10R 5/8), well-thrown, white paint under a yellow glaze. Base D. 0.12 m |
| 10 | 4534.005 | 1Ab | Reddish brown ware (2.5YR 6/4), coarse, white slip under a red/brown painted decoration. |
| 11 | 4534.004 | Pithos 3B | Light red ware (2.5YR 6/6), handmade, coarse, white slip under a red/brown painted decoration. |

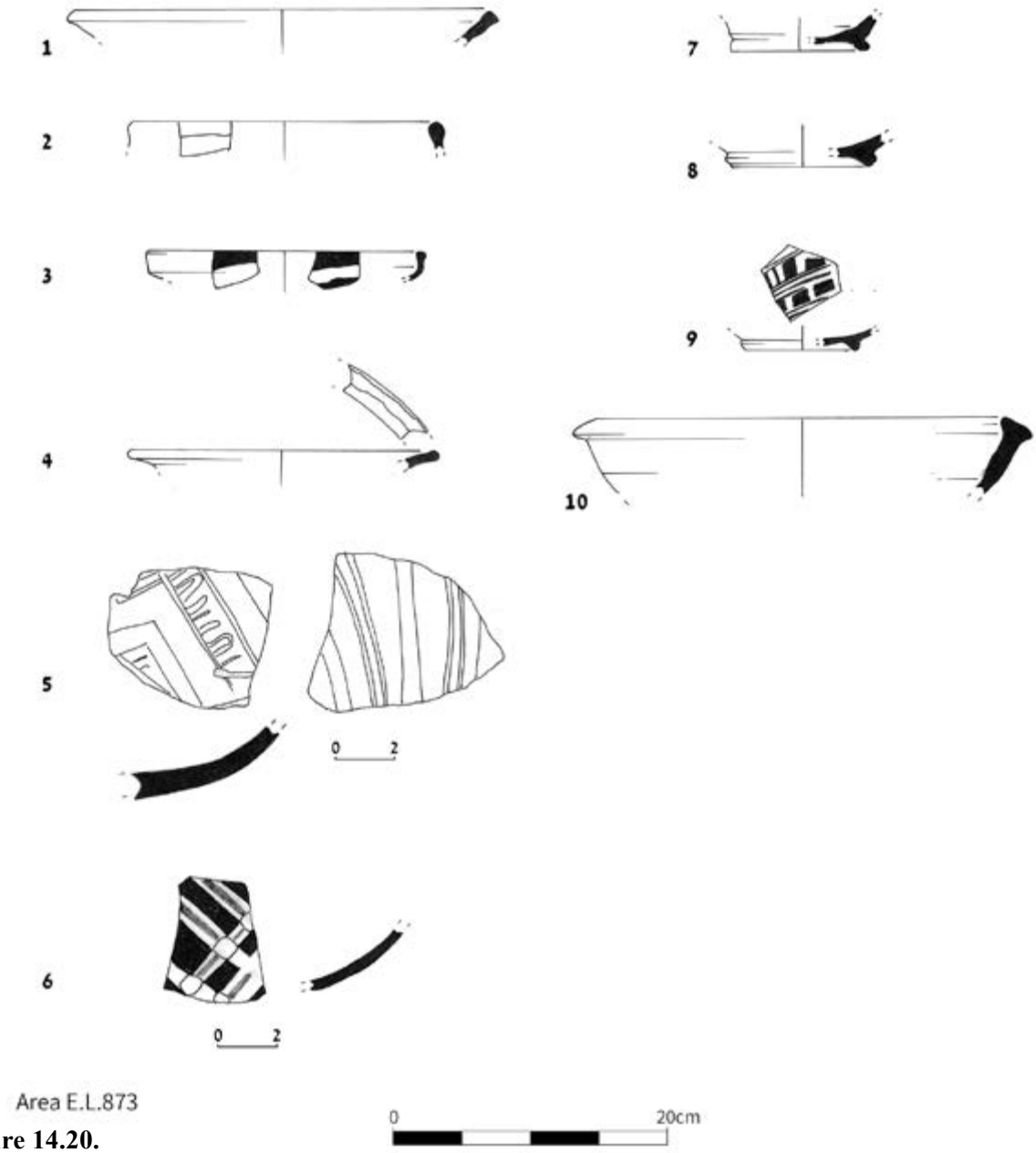



**Figure 14.20.**

**Figure 14.20**. Area E, Locus 873, battle occupation layer.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 8575.004 | 2B1 | Red ware (10R 5/8), well-thrown, dark brown glaze on int. |
| 2 | 8575.010 | 1Ba | Light red ware (2.5YR 6/8), well-thrown and fired, yellowish slip on int. and ext. under a green lead glaze on int. only. Rim D. 0.225 m. |
| 3 | 8575.006 | 1Bd | Red ware (10R 5/8), well-thrown, white paint under a green glaze. Rim D. 0.2 m. |
| 4 | 8575.009 | 1Bb | Red ware (2.5YR 4/6), well-thrown, white slip under a yellow glaze, sgraffito on int. and rim. Rim D. 0.225 m. |
| 5 | 8575.014 | 1Bf | Buff ware (2.5Y 8/2), porous and brittle, white slip on int. and ext. under a blue painted decoration and a transparent alkaline glaze. |
| 6 | 8575.002 | 1Bd | Red ware (10R 5/8), well-thrown, white painted net pattern under a green glaze. |
| 7 | 8575.005 | Unglazed bowl base | Red ware (2.5YR 5/6), coarse. Base D. 0.1 m. |
| 8 | 8575.012 | 1Ba | Red ware (10R 5/8), well-thrown, dark brown glaze applied directly on the ware. Base D. 0.1 m. |
| 9 | 8575.011 | 1Bd | Light red/orange ware (2.5YR 6/6), well-thrown, white painted net pattern under a yellow glaze. Base D. 0.15 m. |
| 10 | 8575.008 | 1Ad | Light red ware (2.5YR 6/6), well-thrown, unevenly fired to a greyish hue due to a reduced firing process. Rim D. 0.3 m. See Fig. 14.4: 5. |

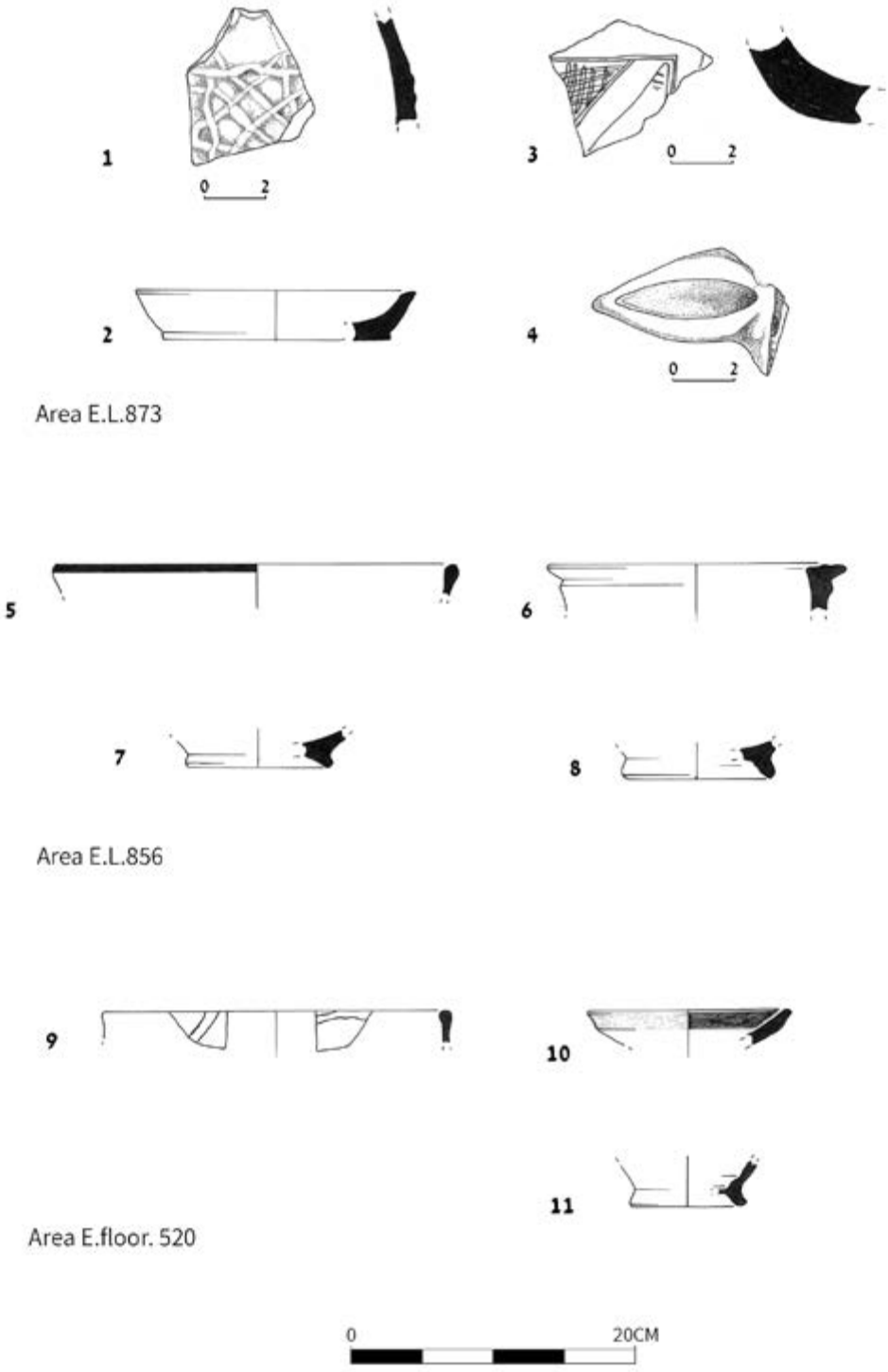

1
0 2
3
0 2
2
4
0 2
Area E.L.873
5
6
7
8
Area E.L.856
9
10
11
Area E.floor. 520
0
20CM

**Figure 14.21**.

**Figure 14.21**. 1–4: Area E, Locus 873, battle occupation layer (continuation); 5–8: Area E, Locus 856, gate floor; 9–11: Area E, Locus 520, floor with coins dated to 1163–1174 and 1178–1179.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 8575.007 | 1Ac | Buff ware (2.5Y 7/3), mould made, well- and thickly potted, porous and brittle. |
| 2 | 8575.013 | Bowl or Lid | Light brown-pink ware (7.5YR 7/4), handmade, coarse, unevenly fired. Base D. 0.16 m, H. 0.03 m, rim D. 0.2 m. No parallels have been found. |
| 3 | 8575.003 | 1Ab | Pink ware (5YR 7/4), coarse, white slip under a red/brown painted decoration on ext. |
| 4 | 8575.001 | 5B3 | Reddish yellow ware (5YR 7/6), well-thrown and fired to a grey hue (5YR 4/1) due to a reduced atmosphere in the kiln. |
| 5 | 8515.007 | 1Ba | Light brown ware (5YR 7/4), well-thrown, thin slip on int. and ext. under a green glaze and brown near the rim on int. only. Rim D. 0.275 m. |
| 6 | 8515.005 | 1Bc | Light red/orange ware (2.5YR 6/8), well-thrown and fired, pinkish slip under a yellow and green colour splashed glaze on int. only. Rim D. 0.1 m. |
| 7 | 8515.002 | 1Ad | Pink-light brown ware (5YR 7/3), coarse. |
| 8 | 8515.006 | 1Bc | Red ware (10R 5/8), well-thrown, pinkish slip on int. and ext. under a colour splashed glaze in green and brown. Base D. 0.1 m. |
| 9 | 5130.001 | 1Bd | Red ware (10R 5/8), well-thrown, few white grits, white paint under a yellow glaze. Rim D. 0.25 m. |
| 10 | 5130.003 | 1Bd | Ware as No. 9, white slip on int. under a yellowish-green glaze except a wide strip near the rim, resulting in a brown glazed band near the rim. Rim D. 0.16 m. |
| 11 | 5130.002 | Jug base | Reddish yellow ware (5YR 7/6), well-thrown, small white grits. Base D. 0.075 m. |

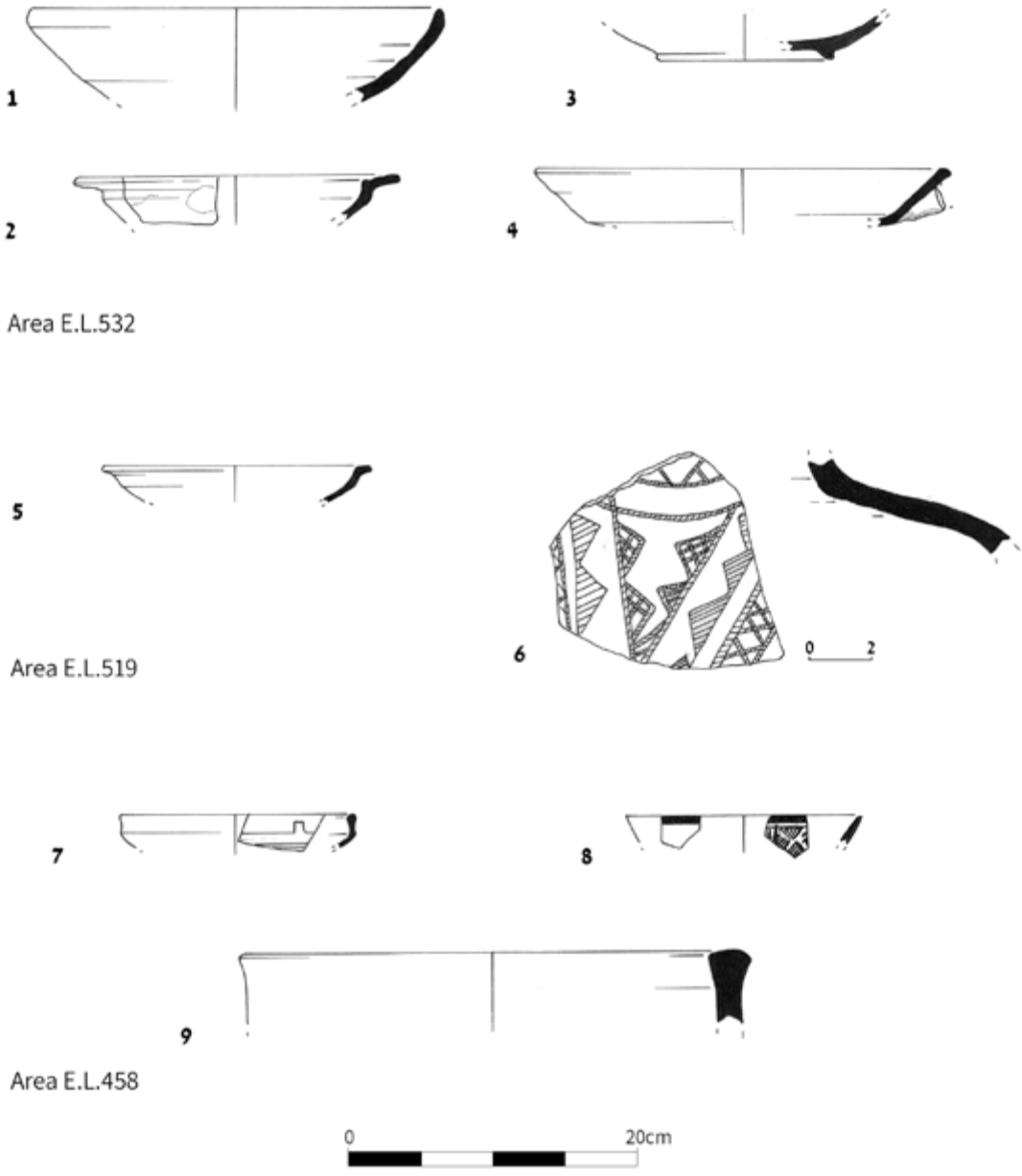



**Figure 14.22**.

**Figure 14.22**. 1–4: Area E, Locus 532, under Floor 520; 5–6: Area E, Locus 519, Floor; 7–9: Area E, Locus 458, fill above Floor 460.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 5156.004 | 1Ba | Light brown-pink ware (7.5YR 7/4), well-thrown and fired, thin white slip on int. and ext. under a greenish yellow glaze on int. only. Rim D. 0.275 m. |
| 2 | 5156.002 | 1Bc | Red ware (10R 5/8), well-thrown, white grits, white slip on int. and ext. near the rim under a yellow and brown colour splashed glaze. Rim D. 0.225 m. |
| 3 | 5156.001 | 1Bb | Red/brown ware (10R 5/6), coarse, unevenly fired, many white grits and quartz inclusions, white slip under a sgraffito decoration and an olive green glaze. Base D. 0.125 m. |
| 4 | 5156.003 | 2B1 | Red ware (10R 5/8), well-thrown, porous, dark brown glaze on int. only. Rim D. 0.275 m. See Fig. 14.10: 7. |
| 5 | 5128.002 | 1Ba | Dark brown ware (7.5YR 4/3), well-thrown, white slip on int. and ext. near the rim under a yellow glaze. Rim D. 0.175 m. |
| 6 | 5128.001 | 1Ab | Light brown-pink ware (7.5YR 7/4), coarse, unevenly fired at a rather low temperature, small to large white grits and quartz inclusions, pinkish white slip on ext. only under a red brown painted decoration. |
| 7 | 4514.003 | 1Bd | Light red ware (2.5YR 6/6), well-thrown and fired, white paint under a yellow glaze. Rim D. 0.16 m. |
| 8 | 4514.001 | 1Bf | Buff ware (10YR 8/2), porous and brittle, white slip on int. and ext. under a blue painted decoration and an alkaline transparent glaze. Rim D. 0.16 m. |
| 9 | 4514.002 | 1Ad | Light red ware (10R 6/6), handmade, coarse, unevenly fired at a rather low temperature, many organic inclusions and white grits, partly burnished on int. Rim D. 0.35 m. See Fig. 14.4:.3 |

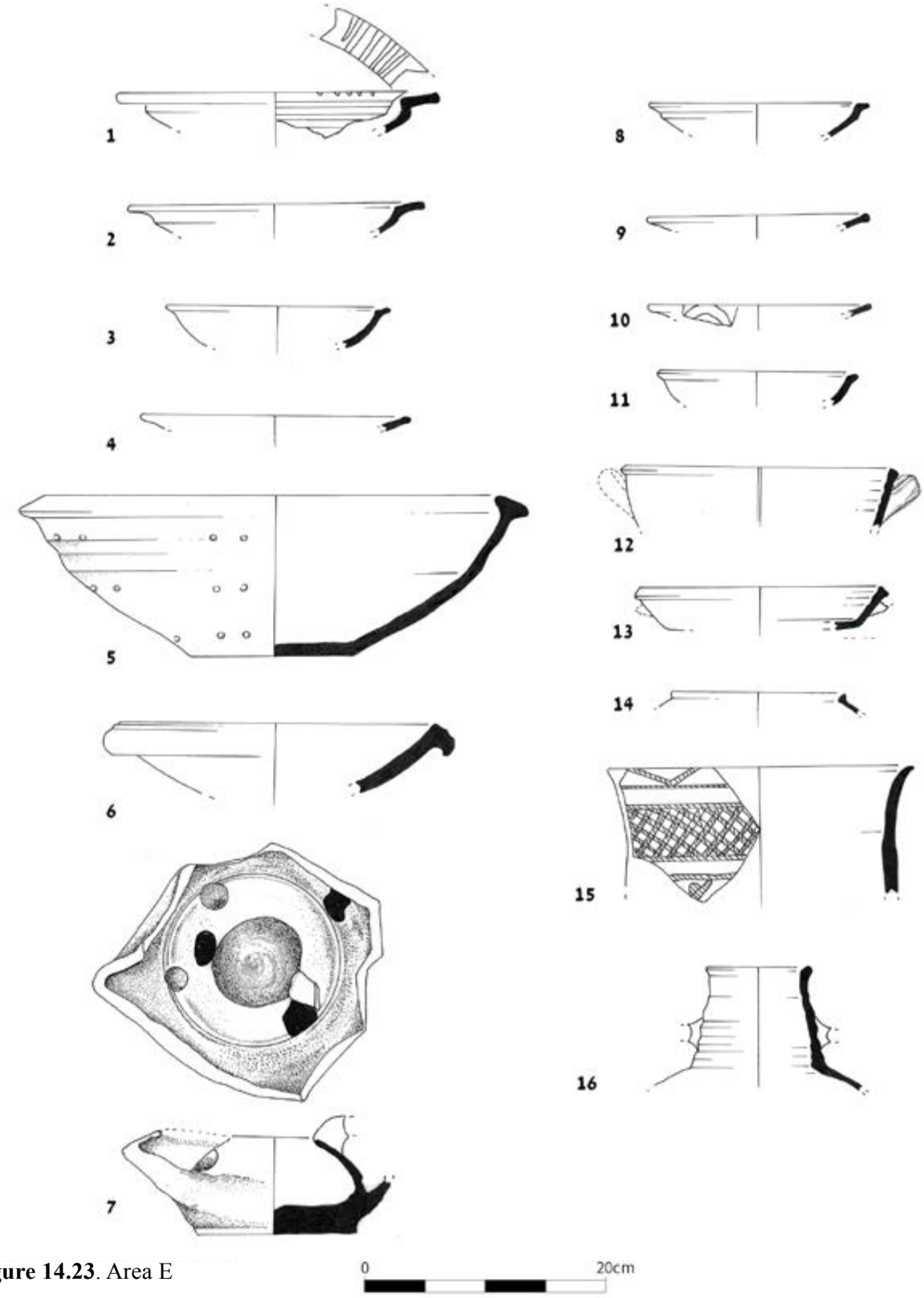



**Figure 14.23**. Area E

**Figure 14.23**. Area E, Locus 529, fill under Floor 519.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 5147.003 | 1Bd | Red ware (10R 5/8), well-thrown, white paint under a yellow lead glaze. Rim D. 0.25 m. |
| 2 | 5247.005 | 1Bc | Red ware (10R 5/8), well-thrown, white slip on int. and ext. near the rim under a sgraffito decorated colour splashed green and brown glaze. Rim D. 0.225 m. |
| 3 | 5133.002 | 1Ba | Red ware (10R 5/8), well-thrown, many small to large white grits, white slip on int. and ext. under a yellow lead glaze. Rim D. 0.175 m. |
| 4 | 5133.006 | 1Ba | Ware and glaze as No. 3. Rim D. 0.225 m. |
| 5 | 5158.002 | 1Ad | Light red/orange ware (2.5YR 6/8), handmade, excellent work, well-thrown, many white and hard black grits (probably basalt?), repairing holes in body. Rim D. 0.375 m, base D. 0.14 m, bowl H. 0.14 m. See. Fig. 14.4: 2. |
| 6 | 5133.004 | 1Ad | Light red ware (2.5YR 6/8), handmade, unevenly fired (dark brown core), coarse, many small to large white grits and quartz inclusions. Rim D. 0.25 m. See Fig. 14.4: 6. |
| 7 | 5147.001 | ? | Light red-yellow ware (10R 4/6), well-thrown, many white grits, manganese stains on a turquoise glaze. Base D. 0.055 m. See Fig. 14.15: 7. |
| 8 | 5139.002 | 1Ba | Dark reddish brown ware (5YR 3/3), well-thrown, white slip on int. and ext. near the rim under a yellow lead glaze. Rim D. 0.175 m. |
| 9 | 5139.001 | 1Ba | Red ware (10R 5/8), well-thrown, slip and glaze as No. 8. Rim D. 0.175 m. |
| 10 | 5147.002 | 1Bc | Red ware (10R 5/8), white paint under a green lead glaze. Rim D. 0.175 m. |
| 11 | 5139.003 | 1Ba | Dark reddish brown ware (2.5YR 3/4), well-thrown, many small white grits, white slip on int. and ext. near the rim under a yellow glaze. Rim D. 0.15 m. |
| 12 | 5133.005 | 2B1 | Red ware (2.5YR 4/8), well-thrown, porous and brittle, dark brown glaze on int. only. Rim D. 0.225 m. See Fig. 14.10: 8. |
| 13 | 5247.004 | 2B1 | Red ware (10R 5/8), dark brown glaze on int. only. Rim D. 0.2 m. See Fig. 14.10: 5. |
| 14 | 5133.00 | 2B2 | Ware as No. 13, remnants of dark brown glaze on ext. Rim D. 0.15 m. |
| 15 | 5139.003 | 1Ab | Light red ware (2.5YR 4/2), coarse, small to large white grits and organic inclusions, pinkish slip on ext. only under a red/brown painted geometric pattern. Rim D. 0.1 m. |
| 16 | 5158.001 | 3C | Red ware (2.5YR 5/6), well-thrown, porous, unevenly fired (dark brown core), small to large white grits, whitewash on ext. near the rim. Rim D. 0.08 m. See Fig. 14.11: 10. |

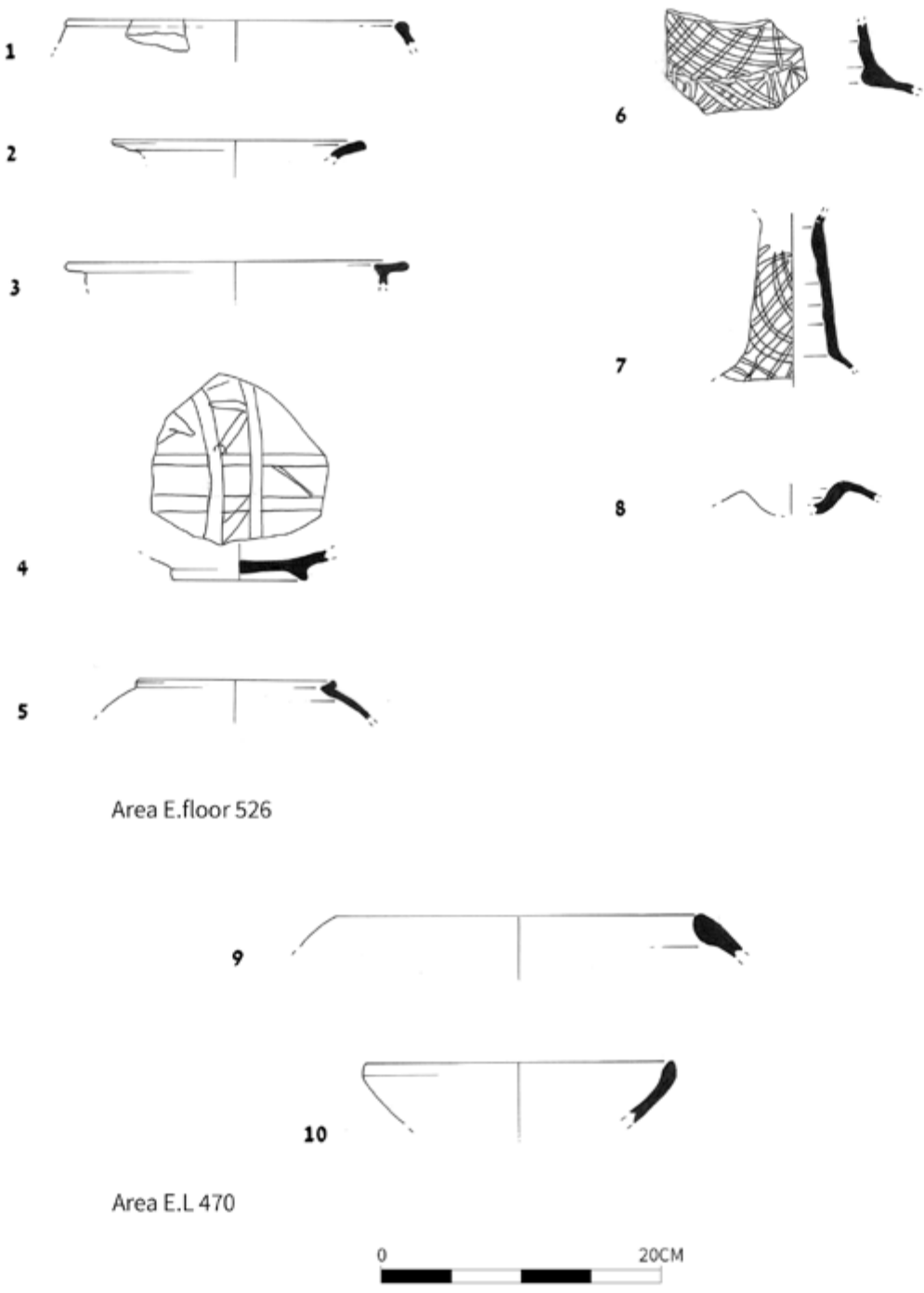



**Figure 14.24.**

**Figure 14.24**. 1–8: Area E, Locus 526, floor with coins dated 1163–1174; 9–10: Area E, Locus 470, under Floor 467.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 5111.004 | 1Ba | Red ware (10R 5/8), well-thrown, many white grits, white slip on int. and ext. near the rim under a green lead glaze. Rim D. 0.25 m. |
| 2 | 5111.002 | 1Ba | Ware and slip as No. 1 under a yellow lead glaze. Rim D. 0.17 5m. |
| 3 | 5123.003 | 1Bd | Light red ware (2.5YR 6/4), well-thrown, white grits and quartz inclusions, white paint under a yellow glaze. Rim D. 0.24 m. |
| 4 | 5111.001 | 1Bd | Red ware (10R 5/6), well-thrown, white and hard black grits, thin white slip on ext. and white painted decoration on int. under a yellow glaze. Base D. 0.09 m. |
| 5 | 5111.003 | 2B2 | Red ware (10R 5/8), well-thrown, remnants of dark brown glaze on ext. Rim D. 0.145 m. |
| 6 | 5123.002 | Jug neck | Light red ware (10R 5/8), well-thrown, white painted decoration under a yellow glaze on ext. |
| 7 | 5111.005 | Jug neck | As No. 6. |
| 8 | 5123.001 | 3A1 Omphalos base | Light red ware (2.5YR 6/8), well-thrown, fired in a reduced kiln to a greyish hue (2.5YR 5/3). Base D. 0.075 m. |
| 9 | 4538.001 | 2A1 | Brown ware (7.5YR 4/4), coarse, many white grits and crushed quartz. Rim D. 0.25 m. See Fig. 14.10: 16. |
| 10 | 4538.002 | 1Ba | Reddish-Yellow ware (5YR 6/6), well-thrown, hard fired, white slip on int. and ext. near the rim under a light green lead glaze. Rim D. 0.27 m. |

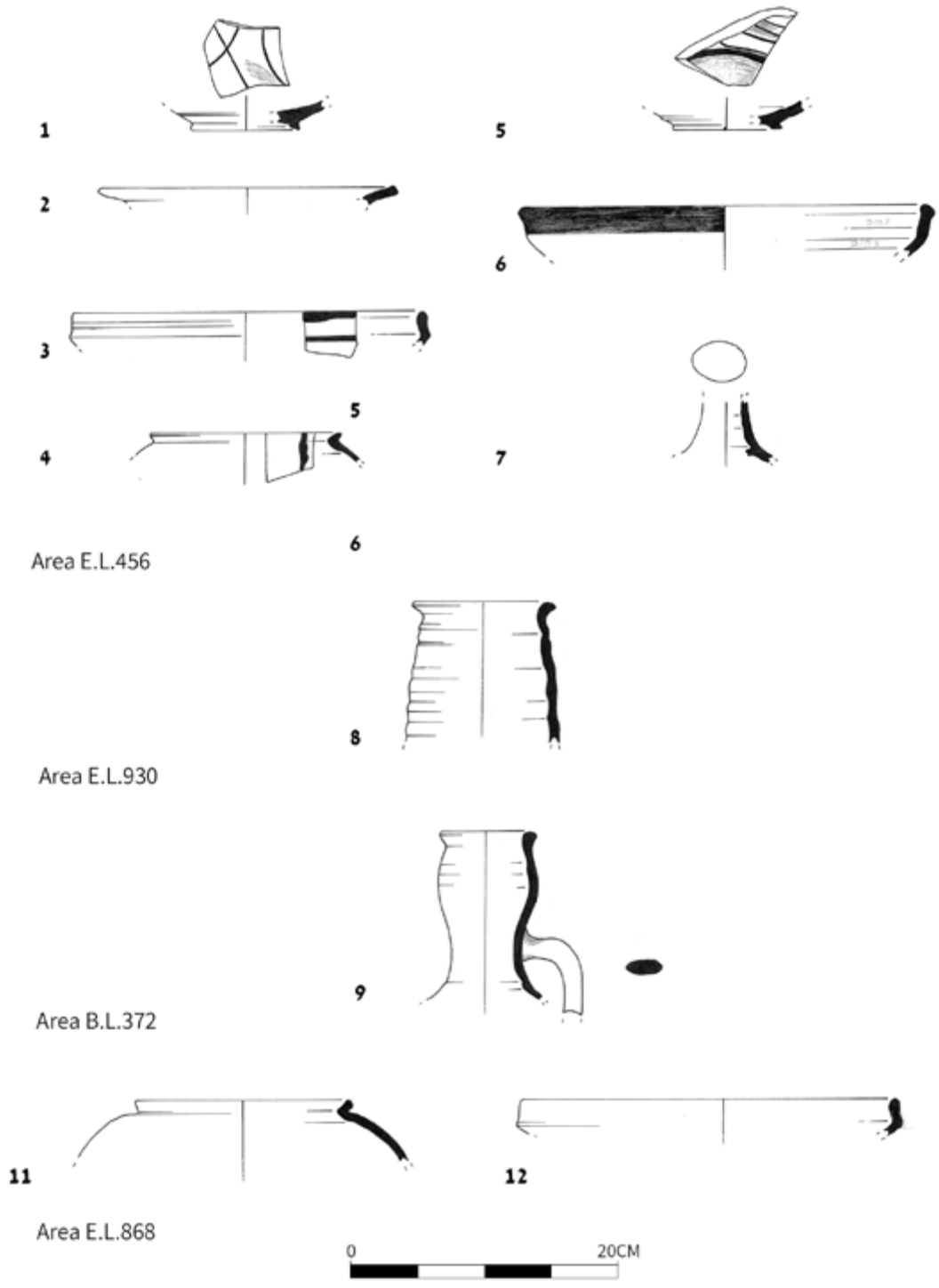

1
2
3
4
5
6
7
Area E.L.456
8
Area E.L.930
9
Area B.L.372
11
12
Area E.L.868
0
20CM

**Figure 14.25**.

**Figure 14.25**. 1–7: Area E, Locus 456, floor; 8: Area E, Locus 930, burnt layer; 9: Area B, Locus 372, fill with two coins dated to the Ayyubid and Mamluk periods; 10–11: Area E, Locus 868, burnt layer.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 4510.007 | 1Bb | Red ware (10R 5/8), well-thrown, white slip on int. only under a sgraffito decorated green glaze. Rim D. 0.075 m. |
| 2 | 4510.001 | 1Bc | Ware as No. 1., white slip on int. and ext. near the rim under a colour splashed yellow and brown glaze on int. and yellow glaze drips on ext. Rim D .0.225 m. |
| 3 | 4510.004 | 1Bd | Red ware (10R 5/8) well-thrown, white painted stripes under a green glaze on the int. (creating a green and brown pattern) and a green glaze applied directly on the ext. without a slip (creating a brown hue). Rim D. 0.25 m. |
| 4 | 4510.003 | 2B2 | Red ware (10R 5/6), remnants of a dark glaze on the int. Rim D. 0.14 m. |
| 5 | 4510.006 | 1Bc | Ware as No. 4., white slip on int. only under a sgraffito decoration and a colour splashed green and brown glaze. Base D. 0.08 m. |
| 6 | 4510.002 | 1Bd | Reddish yellow ware (5YR 7/8), well-thrown and containing white grits, white painted bands interior under a yellow glaze (yellow pattern on a brown background), rim D. 0.35m. |
| 7 | 4510.005 | Flask neck | Red ware (10R 5/8), well-thrown, many white grits, dark brown glaze applied directly on the ext. |
| 8 | 9061.001 | 3A1 | Red ware (2.5YR 5/6), well-thrown, fired to a buff hue (2.5Y 7/3), many white grits, soot remains on ext. Rim D. 0.1 m. See Fig. 14.11: 6. |
| 9 | 3541.001 | Swollen neck | Red ware (10R 5/8), well-thrown, few white grits and crushed quartz. References dated to the 13$^{th}$-14$^{th}$ centuries: Avissar 1996: 168 type 25, Tushingham 1985: 145, Pringle 1986: Fig. 43.13 and De Vaux and Steve 1950: pl.G.23,24. |
| 10 | 8550.002 | 2B2 | Red ware (10R 5/8), well-thrown, remnants of dark brown glaze on int. |
| 11 | 8550.001 | 1Bb | Red ware (10R 5/8), well-thrown, white slip on int. and ext. under a greenish yellow glaze and sgraffito decorations on int. only. Rim D. 0.275 m. |

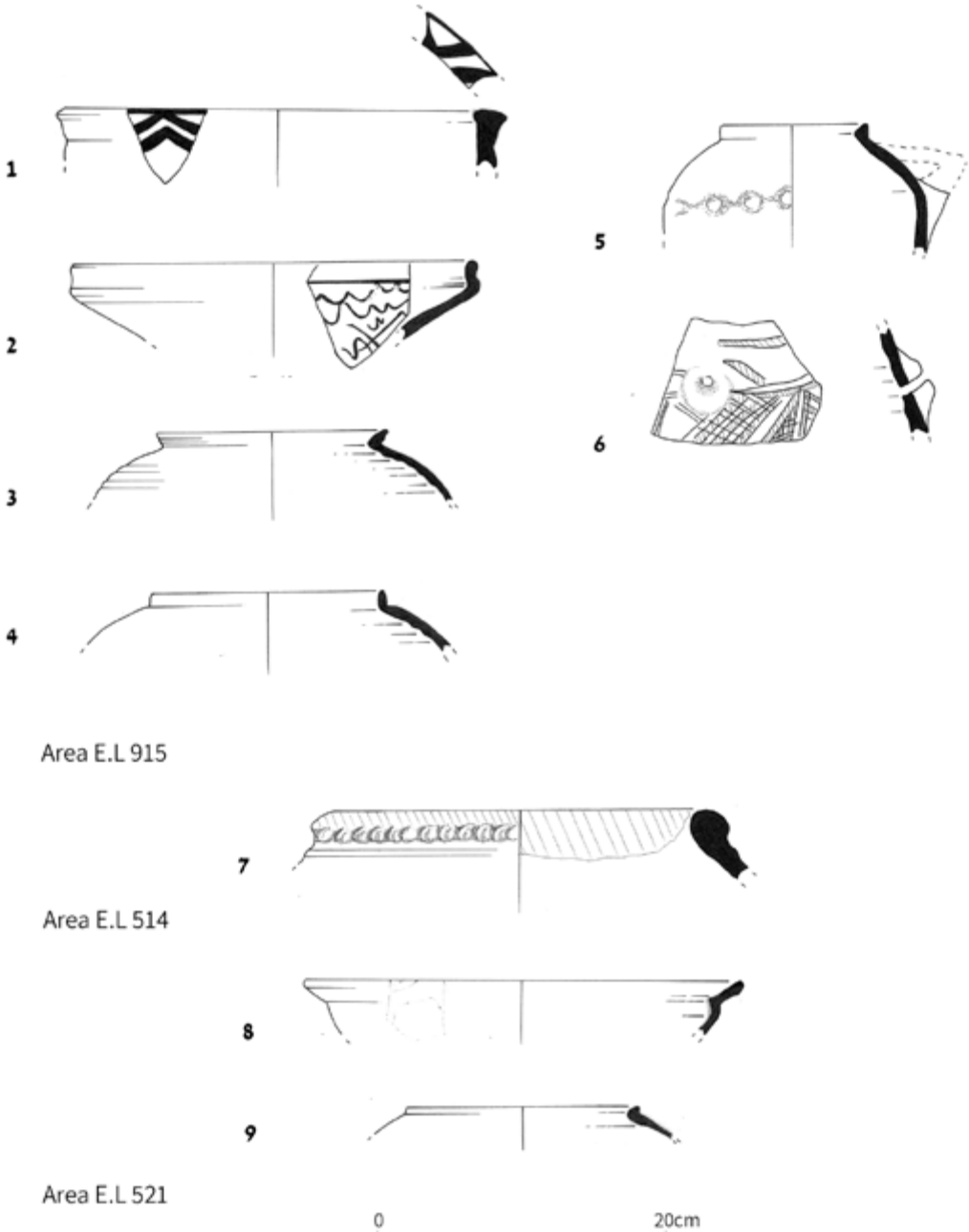



**Figure 14.26**.

**Figure 14.26**. 1–6: Area E. Locus 915, lime fill above an ash layer above Floor 921; 7: Area E. Locus 514, fill under Floor 512; 8–9: Area E, Locus 521, fill above Floor 527.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 9038.004 | 1Aa | Light brown–pink ware (5YR 7/4), coarse, fired at a rather low temperature (grey core), many white grits and quartz inclusions, white slip on int. and ext. under a red and brown painted zigzag pattern on the ext. and on the rim. Rim D. 0.275 m. |
| 2 | 9038.006 | 1Bc | Red ware (10R 4/6), well-thrown, white slip on int. and ext. near the rim under a colour splashed green and yellow glaze and sgraffito decoration. Rim D. 0.275 m. |
| 3 | 9038.002 | 2B2 | Red ware (2.5YR 5/6), remnants of ginger/brown glaze on ext. Rim D. 0.152 m. |
| 4 | 9038.003 | 2B2 | As No. 3. Rim D. 0.165 m. |
| 5 | 9038.005 | 2A1 | Light yellowish brown ware (10YR 6/4), coarse, unevenly fired, organic inclusions, thumb impressions on ext. and a triangle-shaped handle. Rim D. 0.1 m. See Fig. 14.10: 15. |
| 6 | 9038.001 | 1Ab | Red ware (2.5YR 5/6), coarse, unevenly fired, white grits, quartz and organic inclusions, white slip on ext. under a red and brown geometric painted pattern. |
| 7 | 5077.001 | 3B | Light brown — pink ware (5YR 7/4), handmade, coarse, white and hard black grits, yellowish slip on int. and ext. under a red painted band on the rim. Rim D. 0.25 m. See Fig. 14.11: 9. |
| 8 | 5114.001 | 1Bd | Red ware (10R 5/8), well-thrown, random white painted marks under a green glaze on int. only (creating brown and green stains). Rim D. 0.3 m. |
| 9 | 5114.002 | 2B1 | Red ware (10R 5/8), remnants of dark brown glaze on the int. Rim D. 0.15 m. |

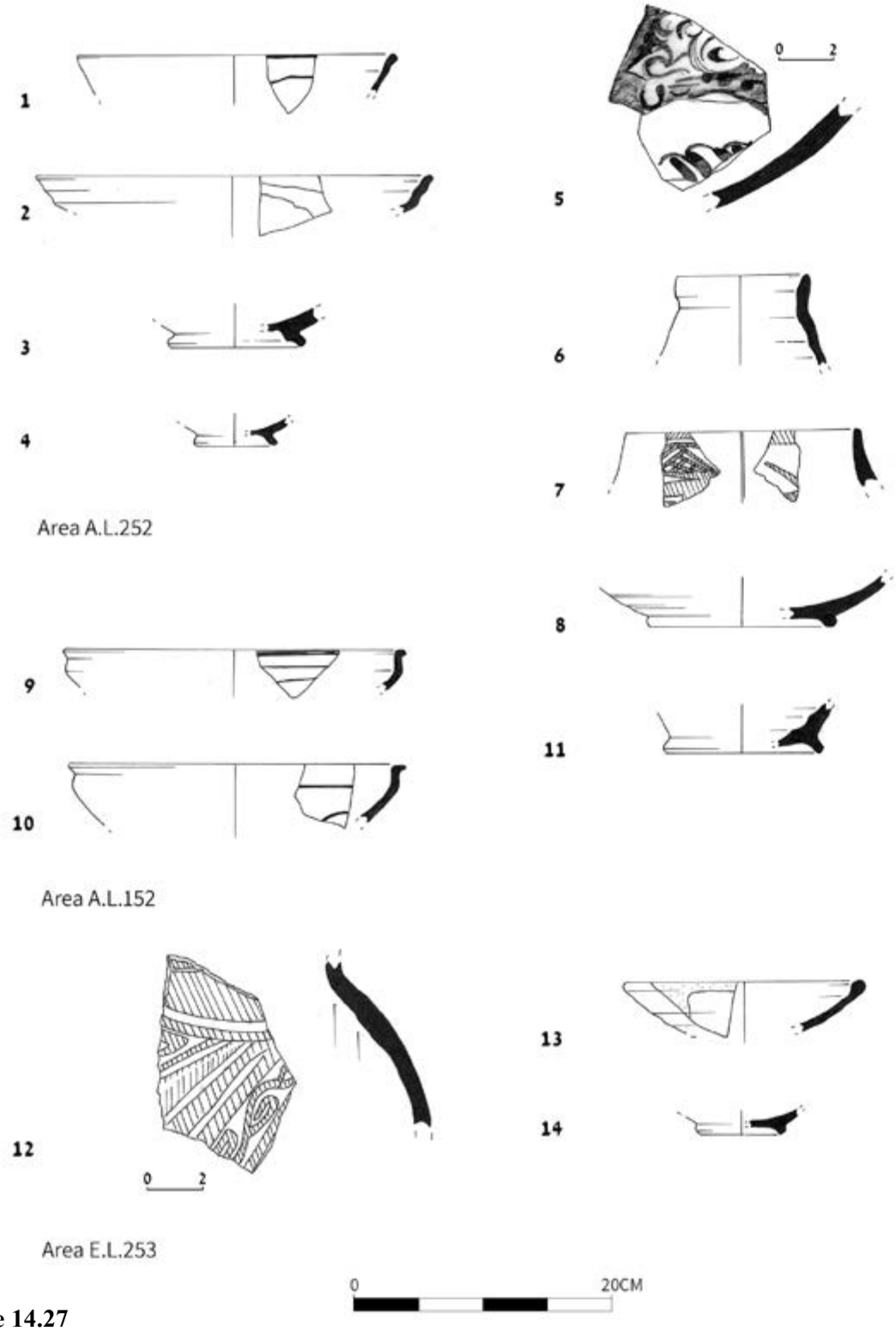

1
2
3
4
Area A.L.252
5
6
7
8
9
10
Area A.L.152
11
12
0 2
13
14
Area E.L.253
0 2
0 20CM

**Figure 14.27**

**Figure 14.27**: 1–8: Area A, Locus 252, occupation layer under debris with a coin dated 1163–1174; 9–11: Area A, Locus 152, mosque floor; 12–14; Area A, Locus 253, fill under mosque mfloor.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 2518.007 | 1Bb | Red (2.5YR 5/4) well potted and fired to a high temperature white slipped interior under sgraffito decoration and lead green glaze int. only D. 0.25m |
| 2 | 2518.005 | 1Bc | Red ware (210R 5/8) well potted, white slipped both sides under a splashed glaze in green and transparent. Rim. D. 0.3m |
| 3 | 2518.002 | 1Bc | Light red ware (2.5YR 7/6) well potted, fired to a brown/greyish hue. Pinkish slip under color splashed glaze in yellow and green int. only. Base D. 0.2m |
| 4 | 2518.001 | 1Ba | Light red ware (2.5YR 6/6) well potted, pinkish slipped under yellow glaze int. only. Base D. 0.115m |
| 5 | 2518.009 | 1Bf | Light grey ware (5Y 8/2) porous and brittle, dark blue ornament under transparent alkaline glaze. |
| 6 | 2518.006 | 3A1 | Red ware (10R 5/6) well potted and hard fired. Hard black grits and quartz inclusion. Rim D. 0.1m |
| 7 | 2518.008 | 1Aa | Handmade light brown ware (7.5YR 7/3) coarse, containing many white grits, quartz and organic inclusions pinkish slipped under red/brown painted decorations both sides. Rim D. 0.17m. |
| 8 | 2518.004 | 1aa | Handmade light brown ware (10YR 7/4) well potted containing crashed basalt. Probably a grinding bowl, Base D. 0.11m. |
| 9 | 1531.001 | 1Bb | Red ware (10R 5/8) well potted white slipped both sides under a sgraffito decoration and a lead yellow glaze int. Rim D. 0.25m |
| 10 | 1531.002 | 1Bb | Bowl, as previous. Rim D. 0.25m |
| 11 | 1531.006 | 1Aa | Red ware (10R 5/6) well potted, white slip both sides. Base D. 0.011m. |
| 12 | 2520.001 | 1Ab | Handmade, light brown ware (7.5YR 7/6), coarse and red coating grog, organic inclusions. Un even firing pinkish slip under painted geometric decorations in red and brown. |
| 13 | 2520.002 | 1Bc | Light brown ware (7.5YR 7/4), well potted white slipped on both sides. Splashes of green, yellow and brown glaze below the rim. D. 0.17m. |
| 14 | 2520.003 | 1Bc | Ware and glaze as previous. Base D. 0.065 m. |

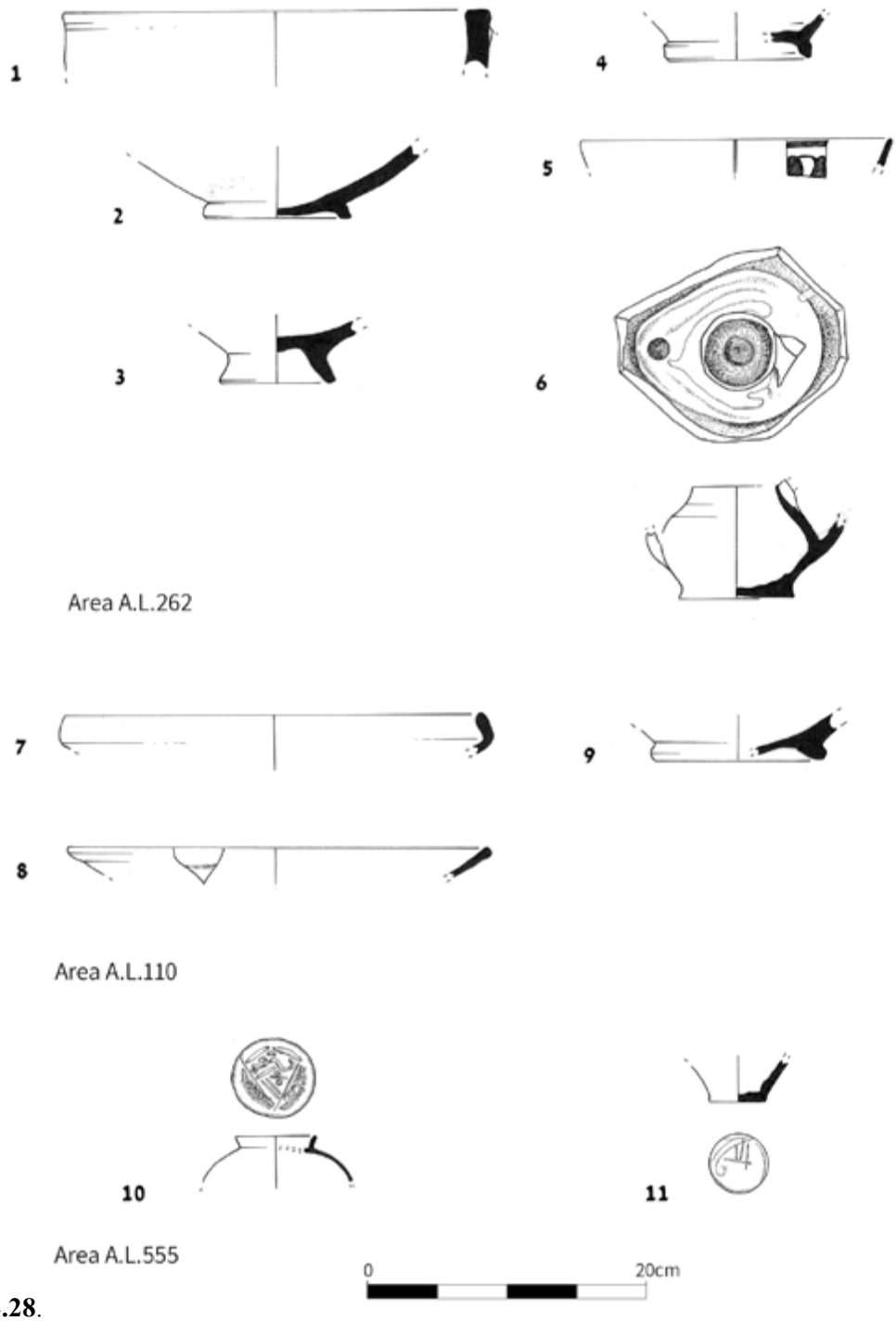



**Figure 14.28**.

**Figure 14.28**. 1–6: Area A, Locus 262, Fill under Locus 252; 7–9: Area A. Locus 110: occupation level; 10–11: Area C, Locus 555, occupation layer by the gate.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 2344.004 | 1Ad | Handmade, light red coarse ware (2.5YR 6/6), congaing white grits quartz and organic inclusions. Uneven firing (grey core) in a relatively low temperature. Rim D. 0.3m. |
| 2 | 2344.002 | 1Ba | Light red ware (2.5YR 6/6) well potted pinkish slip under lead yellow glaze interior only. Base D. 0.1m |
| 3 | 2344.003 | 1Ba | Light brown coarse ware (2.5YR 5/4) containing white grits and quartz inclusions, fired to a grey hue. White slipped under a lead green glaze interior. Tripod marks on the inside. Base. D. 0.85 m |
| 4 | 2344.005 | 1Ac | Red ware (2.5YR 5/6) well potted, containing white grit sand flakes of mica. Trimmed with a sharp tool. Base D. 0.085m |
| 5 | 2557.001 | 1Bf | Light grey ware (5Y 7/2) porous and brittle dark blue painted decorations on a white background under a transparent alkaline glaze. Rim. D. 0.225m. |
| 6 | 2344.001 | 4B2 | Red ware (2.5YR 6/6) well potted white slip painted decorations under yellow glaze. Base D. 0.03m. |
| 7 | 1029.002 | 1Bc | Red ware (10R 5/8) Well potted white slipped on both sides. Splashes of green, yellow and brown glaze below the rim. Rim D. 0.25m. |
| 8 | 1031.001 | 1Ba | Red ware (10R 5/8) well potted white slipped on both sides under a lead green glaze (Rim D. 0.30m. |
| 9 | 1029.001 | 1Ba | Light red ware (2.5YR 7/6) well potted fired to a light brown hue. Greenish yellow lead glaze applied directly on the vessel. Base D. 0.125m. |
| 10 | 5533.001 | 1Ac | Greenish/buff ware (5Y 7/3) well potted. Strainer D. 0.05m |
| 11 | 5533.002 | 1Ac | Light red ware (2.5YR 7/6) well potted containing white and black grits. Potter mark on the base. Base D. 0.004m. |

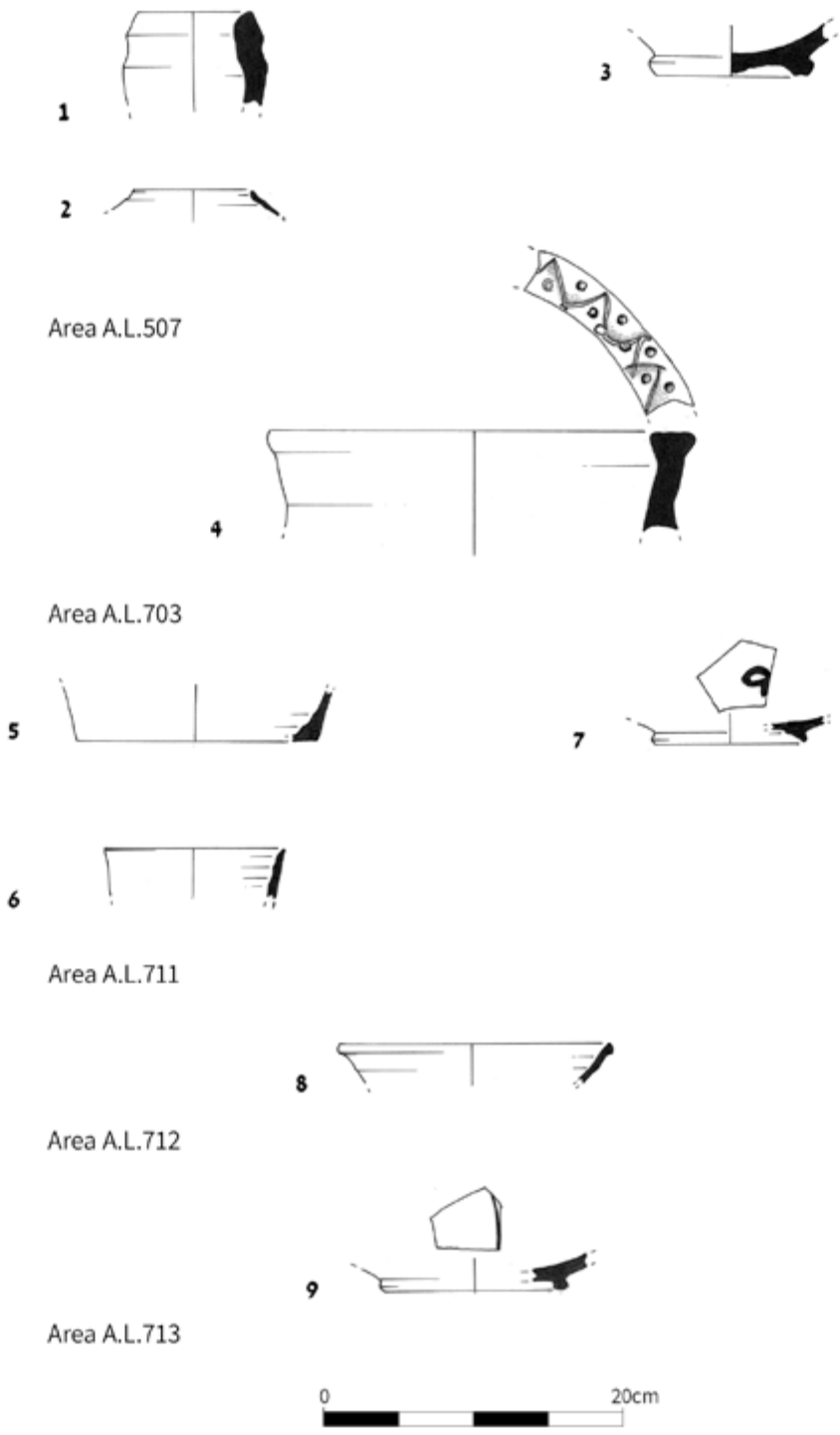

1
2
3
Area A.L.507
4
Area A.L.703
5
6
7
Area A.L.711
8
Area A.L.712
9
Area A.L.713
0
20cm

**Figure 14.29.**

**Figure 14.29.** 1–3: Area A. Locus 507: Floor; 4: Area A. Locus 703: below the collapse south of the northern curtain wall; 5–6: Area A. Locus 711: Floor infrastructure; 8: Area A. Locus 712: fill under stone debris; 9: Area A, Locus 713: fill between floors south of curtain wall.

| NO. | BASKET # | TYPE | DESCRIPTION |
|---|---|---|---|
| 1 | 5014.002 | 1Ab | Handmade, coarse light brown ware (7.5YR 7/4). Containing many basalt and grog inclusions fired to a light red hue. Rim D. 0.075m. |
| 2 | 5014.001 | 2B2 | Red ware (10R 5/8) well potted, remnants of dark brown glaze on the rim and inside. Rim. D. 0.075m. |
| 3 | 5018.001 | 1Ba | Light red ware (2.5YR 7/6) Well potted, white slipped under lead green glaze. Base D. 0.1m. |
| 4 | 7005.001 | 1Ad | Handmade coarse red ware (2.5YR 4/6), containing many basalt, white grits and organic inclusions. Rim D. 0.28m. |
| 5 | 7046.001 | 1Ab | Handmade, red ware (7.5YR 7/4). Containing many basalt and quartz inclusions, fired to a darker hue. Base D. 0.15m. |
| 6 | 7046.003 | 1Ac | Greenish buff ware (5Y/73) well potted. Rim. D. 0.12m. |
| 7 | 7046.002 | 1Bf | Light brown ware (5YR 7/4) black slip painted under white slip and turquoise glaze (resembles Egyptian ware). Base D. 0.8m. |
| 8 | 7033.001 | 2B1 | Red ware (10R 5/4), well potted dark brown glaze on the interior. Rim D. 0.28m. |
| 9 | 7044.001 | 1Bb | Red ware (10R 5/8), well potted white slipped under lead green glaze and sgraffito decoration on the inter. Base D. 0.125m. |

CHAPTER 15

# WOOD SAMPLES FROM THE TEMPLAR FORTRESS

*Nili Liphschitz*

Fragments of wood were collected during the excavation of the fortress to learn the origins of the wood used in its construction. Some fragments were charred while others were not. Remains of charred wood were collected from the burnt logs of the main gate (Area E) and the posterns (Areas C-G) (Table15.1).[1]

According to ʿImād al-Dīn, during one of the first night of the siege, after Saladin had managed to take the *bāshūra* and his men settled there for the night, the Templar garrison set fire behind each gate in order to prevent the Muslim forces from breaking into the fortress.[2]

Minute wood samples of 0.51 cu. cm. were taken from the metal tools for analysis (Table 15.2), in an effort to minimize damage to the objects. Samples were dipped in an ethyl alcohol-Safranin solution; aspirated in absolute ethyl alcohol and immersed in a celloidin-clove oil solution for 24 hours, then rinsed in absolute ethyl alcohol and transferred to 5–55C paraffin for 72 hours. Blocks were made in paraffin and cross-sectioned; longitudinal, tangential and radial sections were also made. Identification of the timber up to the species level was carried out on these sections under the microscope. Comparison was made with reference sections prepared from recently, systematically identified living trees, and with botanical atlases of various regions.

The results show that the wood remains came from seven different tree species (Table 15.1): Tabor oak (*Quercus ithaburensis*), Oriental plane (*Platanus orientalis*), Euphrates poplar (*Populus euphratica*), Jordan tamarisk (*Tamarix jordanis*), Christ's thorn jujube (*Ziziphus spina-christi*), date palm) *Phoenix dactylifera* (and Cedar of Lebanon (*Cedrus libani*). Most of the samples (14 of 27) came from Tabor oak. Six of the above species still grow in the region of the fortress. Tabor oak can be found in the Hula Valley area and its surroundings and further north; its trees are scattered throughout the area, especially at Horshat Tal. Christ's thorn jujube grows along the shores of the Sea of Galilee and further north. Jordan tamarisk and Euphrates poplar grow along the banks of the Jordan River. Oriental plane grows along the banks of the River Dan and date palms are cultivated near the Sea of Galilee. In contrast, the Cedar of Lebanon never grew in historical Palestine/present-day Israel. The latter grew naturally in the Lebanese mountains, Turkey

1 Professor Liphschitz, of the Institute of Archaeology at Tel Aviv University, was a palaeobotanist. It was always a pleasure to visit her lab. Sadly, Professor Liphschitz passed away in August 2019. This report was written by her in 1997, in Hebrew. It has since been translated by Kate Raphael and edited by Leigh Chipman, Sherry Whetstone and David Ilan.

2 ʿImād al-Dīn al-Isfahani, *Sana l-Barqu al-shami* (Riyadh, 1989), 169.

and Cyprus, where the short-leaved species grows. Because of the geographical proximity of the site to Lebanon, it is more than likely that the cedar wood found at the fortress was brought from Lebanon.

Due to the wood's poor state of preservation and because only small fragments remained, the wooden remains taken from e the metal handle sockets of the tools could be defined only by genus (Table 15.2). The wooden components left of the weapons, the mace head, and two adzes, were made of coniferous and oak wood. Since conifers do not grow in the area of the site it can be assumed that these were brought to the fortress from some distance. The tools were probably made locally.

The wood fragments found in the handle sockets of the hammer and one of the adzes, are made of oak, probably Tabor oak, the remains of which were found at the site.

**Table 15.1.** Locations of the wood samples taken from the fortress.

| AREA | LOCUS | BASKET | TREE SPECIES | REMARKS |
|---|---|---|---|---|
| C — eastern postern | 551 | 5556 | Tabor oak | |
| C — eastern postern | 569 | 5545 | Tabor oak | Sample taken from section |
| C — eastern postern | 569 | 5554 | Tabor oak | |
| C — eastern postern | 569 | 5561 | Tabor oak | |
| C — eastern postern | 583 | 5616 | Tabor oak | |
| G — southwestern postern | 220 | 2227 | Tabor oak | |
| G — southwestern postern | 227 | 2244 | Tabor oak | Sample taken from a burnt layer |
| G — southwestern postern | 228 | 2273 | Tabor oak | Sample taken from a burnt layer |
| G — southwestern postern | 228 | 2257 | Tabor oak | Sample taken from a burnt layer |
| G — southwestern postern | 232 | 2298 | Tabor oak | |
| G — southwestern postern | 235 | 2321 | Tabor oak | |
| E — main gate | 873 | 8578 | Tabor oak | |
| E — main gate | 873 | 8579 | Tabor oak | |
| E — main gate | 873 | 8577 | Tabor oak | |
| E1– main gate | 529 | 5150 | Oriental plane | |
| B — Mamluk hamlet | 373 | 3578 | Oriental plane | |
| C — eastern postern | 585 | 5619 | Oriental plane | |
| C — eastern postern | 572 | 5561 | Euphrates poplar | |
| E — main gate | 872 | 8579 | Date palm | |
| C — eastern postern | 572 | 5610 | Date palm | |
| A — north of the reservoir | 156/7 | 1540 | Christ's thorn jujube | |
| G — southwestern postern | 208 | 2073 | Christ's thorn jujube | |
| C — eastern postern | 569 | 5539 | Jordan tamarisk (x5) | |
| G — southwestern postern | 228 | 2250 | Cedar of Lebanon | Found below collapse and a layer of ash, perhaps from part of the postern's door (?) |
| G — southwestern postern | 228 | 2257 | Cedar of Lebanon | Found below collapse and a layer of ash, perhaps from part of the postern's door (?) |
| G — southwestern postern | 227 | 2244 | Cedar of Lebanon | Found below collapse and a layer of ash, perhaps from part of the postern's door (?) |
| G — southwestern postern | 203 | 2050 | Cedar of Lebanon | Found above the floor of the postern |

**Table 15.2.** Wood samples from metal objects.

| TOOL | AREA | LOCUS | BASKET | TREE SPECIES |
|---|---|---|---|---|
| Adze socket | C — eastern postern | 572 | 5608 | Conifer |
| Adze socket (charred wood) | C — eastern postern | 572 | 5602 | Oak |
| Hammer socket (charred wood) | E — main gate | 873 | 8570 | Oak |

CHAPTER 16

# THE ARCHAEOBOTANICAL FINDS: GRAINS, LEGUMES AND ONE OLIVE

*Nili Liphschitz*

Other than meat, fish, and poultry, the fortress menu also included a variety of legumes, and cereals played a dominant role in the diet of the men at the fortress.[1] Both wheat and barley could have been used for making bread, but they could also have been boiled and served as a gruel. Barley may have also been used to feed mules, donkeys, and horses to supplement grazing.

A few wheat grains, a few barley grains and a stone of a European olive were found at the site (Table 16.1). Because barley, wheat and olives are part of the standard local diet and food was transported from region to region in all periods, it is not possible to know their precise origin. According to Muslim sources, the fortress' store rooms were well stocked.[2]

**Table 16.1.** Seeds from the fort

| AREA | LOCUS | BASKET | TYPE |
|---|---|---|---|
| C — eastern postern | 552 | 5505 | Barley |
| K — milling room | 726 | 7081 | Wheat |
| C — eastern postern | 589 | 5643 | Olive |

During the 2007 season, while excavating the equid skeletons on the kitchen floor (Area E, L.115, B.1053) dry sifting and wet sifting yielded a variety of legumes: five chickpeas (*Cicer arietinum*), 12 lentils (subsp. *macro-sperma*), 23 fava beans (*Vicia faba*) that appear to be of the large type (unlike the Egyptian fava beans; they are larger than the Fava *var. paucijuga*), and 27 peas, some of which may be identified as *Vicia peregrine*.[3] All the above have a relatively long shelf life if kept in a dry storage area.

It is important to note that both fine dry sieving and wet sifting were rarely carried out at the Ateret excavations. It is certain that had larger quantities of soil been sifted, the variety of plants found would have been greater than what this short report presents.

1 Bronstein, Y. The Hospitallers and the Templars, Food and Refractories in the Twelfth–Fourteenth Centuries. In I. Ziffer and O. Tal (eds.) *Last Supper in Apollonia* (Tel Aviv, 2011): 62–68. (Hebrew), 90–91, 100; Bronstein, J. Food and the Military Orders: Attitudes of the Hospital and the Temple between the Twelfth and Fourteenth Centuries. *Crusades* 12 (2013): 150.

2 Abū Shāma, Shihāb al-Dīn ʿAbd al- Raḥmān b. Ismāʿīl, *Kitāb al-rawḍatayn fī akhbār al-dawlatayn* (Beirut, 1997), vol. 3: 44.

3 The identification of the material from the 2007 season was done by Prof. Shahal Abbo, of the Robert H. Smith Faculty of Agriculture, Food and Environment, the Hebrew University of Jerusalem, Israel.

CHAPTER 17

# 'COINS, PURSES AND PIGS': THE MEDIEVAL COINS OF VADUM IACOB

*Robert Kool*

Some 384 coins were discovered during the twelve seasons of excavation at the Templar castle of Vadum Iacob.[1] An additional thirty coins were collected from the site by members of nearby kibbutz Gadot prior to the present excavations. The latter were classified as stray finds. The above coin finds also include a considerable number of pre-Crusader period coinages, particularly a large quantity of Ptolemaic and Seleucid coinages (113), among them a hoard of forty-five small Seleucid 'palm tree' bronze coins.[2] These earlier coins are discussed in a separate report dedicated to the pre-medieval coin finds of the site.[3] The report below is dedicated entirely to the Frankish period and subsequent strata uncovered in the castle's excavations.

The medieval coinages at the site number some 248 coins dating between the early twelfth and late fifteenth centuries. Of particular interest are those coins that belong to the exceptionally short eleven months' existence of the Crusader castle: from its construction and garrisoning by King Baldwin IV and a Templar force starting in October 1178, to its dramatic demise on August 30, 1179, when Ayyubid forces under the personal command of Saladin (Ṣalāḥ al-Dīn) successfully mined its walls, stormed the castle and killed or imprisoned its inhabitants.

The latter group numbers some 43 single finds of Crusader and Ayyubid period money and a large hoard of some 164 royal *deniers* of the kingdom of Jerusalem. These coins were all found in dramatic circumstances (see below) within the castle's perimeter and are important for three reasons. First, they provided crucial contextual dating vis-à-vis other material finds at the site and the Crusader and Arab written sources related to the castle. Secondly these coins offer us an almost full range of the coins — gold, silver, bronze, and lead — circulating in the kingdom of Jerusalem and the adjacent Ayyubid realm — a rare 'snapshot' of the money circulating at a particular point in time. Thirdly, the extremely well-dated coin finds of the frontier castle of Vadum Iacob — eleven months between 1178–1179-are important for the study of the monetary history of the Crusader kingdom of Jerusalem; detailed comparisons of coins from Vadum Iacob

1 These include ten unidentifiable specimens. All photographs are by Dafna Gazit the Israel Antiquities Authority photographer.

2 Ellenblum, R., Marco, S., Kool, R., Davidovitch, U., Porat, R. and Agnon, A. Archaeological Record of Earthquake Ruptures in Tell Ateret, the Dead Sea Fault. *Tectonics* 34/10 (2015): 2105–2117.

3 Syon, D. Meẓad 'Ateret — The Early Coins. In *Ateret*: *The Early Periods* (to be published in the forthcoming report of the pre-Crusader archaeological evidence).

with those from other sites dated to the Crusader period allow us to draw conclusions about the minting and chronology of types of coins, regalian rights and the circulation of coinage in the Latin Kingdom during the second half of the twelfth century, up to the battle of Hattin.

The remaining post-1179 coinages of the site, some fifteen Ayyubid and twenty-nine Mamluk-period silver *dirhams* and copper *fulūs*, accompany the story of what happened after the destruction of the Crusader fortress: the re-conversion of the site into a Muslim pilgrimage shrine and waystation, and later, during the Mamluk period, the development of a small village or hamlet.

## Vadum Iacob and the historiography of Frankish coin research

The study of the coinage of the Frankish East was initiated by a number of Danish, German and French *savants* during the early nineteenth century, reaching its apogee in Louis Félicien De Saulcy's *Numismatique des Croisades* published in 1847.[4] Despite these promising beginnings, Frankish numismatics has regrettably remained on the margins of modern Crusader historiography, its potential contribution to the field of demography, economic, cultural, and art history of the period largely ignored.[5] Curiously enough, this was not so in the nineteenth and early twentieth centuries. Historians like Eugène de Rozière, who wrote extensively on Lusignan Cyprus, not only regarded the study of coins of the Frankish period as an important branch of the historical *métier*, but also authored his own essay on Lusignan coinage.[6] True, the identification and the study of such coinage was then largely done by the simple means of quoting Crusader chronicles, and dating dynasties and individuals. This perception of Frankish coinage as a branch of dynastic history was quite resilient, particularly as Schlumberger's *Numismatique d'Orient latin*, published in 1878, remained the dominant work in the field for more than a century.[7]

This all changed with the two editions of Michael Metcalf's *Coinage of the Latin East*, published in the 1980s and 1990s.[8] Metcalf's research — in particular his publication of Frankish coin hoards — has done much to advance the study of Crusader period coinage. His efforts to combine modern numismatic methodologies with a critical reading of historical sources has given the study of Frankish coinage a scientific and historical basis. Still, it is very much a work of type classification, based on coins from hoards of often questionable integrity and collections of unprovenanced coinages.

It is here that well-documented excavations such as Vadum Iacob make a major contribution to

4 Williams, D., Schindel, N. and Kool, R. Die kreuzfahrerzeitlichen Münzen im Wiener Münzkabinett. Erster Teil: Die Prägungen aus dem Kreuzfahrer Staaten. Zugleich ein Beitrag zur Forschungs- und Sammlungsgeschichte der Kreuzfahrernumismatik in ihrer Wiegenzeit. *Numismatische Zeitschrift* 124/125 (2019): 269–292.

5 Kool, R. *The Use of Coinage in the Frankish Kingdom of Jerusalem 1099–1291*. PhD Dissertation. The Hebrew University of Jerusalem (2013b), 10–34.

6 de Rozière, E. *Numismatique des rois latins de Chypre* (Paris, 1847).

7 Schlumberger, G. *Numismatique de l'Orient latin* (Paris, 1878).

8 Metcalf, D. M. *Coinage of the Crusades and the Latin East in the Ashmolean Museum, Oxford* (London, 1983); the work was substantially re-edited and enlarged and published in a second edition in 1995.

the field: they provide us with the exact context and dating tools which have been lacking up to now in the crucial study of coin circulation in the Frankish Kingdom. The finds at Vadum Iacob are particularly important since relatively little was and is known of twelfth-century monetary circulation; even today, much of what we know on the subject has been based on a dozen published hoards, both smaller and larger, many of them coming from the antiquities market and thus often of questionable provenience, while stray finds were virtually non-existent for the period.[9] Moreover, many of the more recent published excavation sites where Crusader period coins were found are of the thirteenth century.[10]

## The numismatic methodology of Vadum Iacob

Strictly speaking, the coins excavated at Jacob's Ford are random site finds — single coins lost by the inhabitants while the site was active. As a rule, the random quality renders site finds more statistically secure evidence, though single coin losses usually cannot be dated accurately, nor used to establish a chronological sequence of different coin types. However, the Vadum Iacob finds come from an extremely well dated context. Consequently, the coin material behaves much like conventional hoard material, adding substantially to the quality of the conclusions about currencies circulating during this period the evidence provided by a well-dated purse hoard, discussed below in more detail. And of course, the abundant documentation provided by both Muslim and Frankish chroniclers allow us to establish quite accurately who used the coins found on the site.

To what extent do the finds at Vadum Iacob reflect or deviate from what we know of Frankish coin circulation? The below analysis of the four main categories of finds of this period — gold bezants, billon *deniers*, lead token money, and Muslim copper *fulūs* (Zanjid and Ayyubid)—will tell us more. Finally, a presentation of the few coin finds from the later Mamluk and Ottoman strata is appended.

9 For an exposition of the model, see: Metcalf, D. M. Describe the Currency of the Latin Kingdom of Jerusalem. In B. Z. Kedar, J. Riley-Smith, and R. Hiestand (eds.) *Montjoie: Studies in Crusade History in Honour of Hans Eberhard Mayer* (Aldershot, 1997),191–194. For the hoards mentioned, see: Metcalf, *Coinage of the Crusades*, 309–23, hoard nos. 3,7,9,18–19, 25–27.

10 For Ascalon, see: Kool, R. The Medieval Coins of Ashkelon (1985–2015). In T. Hoffman (ed.) *Ashkelon 8*: *The Islamic and Crusader Periods* (Winona Lake, IN 2019), 535–537. For Jaffa, see: Kool, R. The Coins at the Ottoman Police Compound (Qishle) of Jaffa (2007). In Y. Arbel (ed.) *Excavations at the Ottoman Military Compound (Qishle) of Jaffa* (Münster, 2021a), 391–405. For Atlit/Pilgrim's Castle, see: Metcalf, D.M., Kool, R. and Berman A. Coins from the Excavations of 'Atlit (Pilgrims' Castle and Its Faubourg). '*Atiqot* 37 (1999): 89–164. For Montfort castle, see: Kool, R. Coin Finds and the Use of Money at Montfort (1926–2012). In A. J. Boas and R. G. Khamisy (eds.) *Montfort: History, Early Research and Recent Studies of the Principal Fortress of the Teutonic Order* (Leiden and Boston, 2017), 242–255.

## Coin Finds of the Crusader Castle (1178–1179)

### Gold Bezants

Two al-ʿĀmir bezants (Nos. 1–2) were discovered in the castle's grounds: one came from the northern castle wall, while another coin was excavated *in situ* from under a tabun, outside the fortifications of the southern main gate (Fig. 17.1). Both clearly display the illegible pseudo-kufic script so typical of the imitation dinars minted by the kings of Jerusalem. The dinars are of the types classified by Yvon and Balog as 'crude' imitations.[11] Similar types of imitation dinars have been previously dated by the metrological studies of Gordus and Metcalf to the period from 1148–1159 to 1187.[12] The finds of these bezants at Vadum Iacob, securely dated to the years 1178–1179, now firmly confirms and further refines their suggested chronology.

**Figure 17.1.** Two Frankish bezants excavated at Vadum Iacob.

These *bezants sarrazinois*, 'Saracen bezants', appear frequently in surviving charters of the Frankish kingdom that chronicle sales of landed property and houses in the twelfth and thirteenth centuries. Gold coins, particularly those of the Frankish period, are extremely rare finds in controlled excavations. The reason is quite simple: such coins were deemed too valuable by contemporaries to be discarded accidentally. Frankish gold coins usually appear therefore in hoards deliberately concealed by their owners. Two well-known hoards, dated to the second half of the twelfth century, are the bezants excavated in 1932 in the Church of the Nativity in Bethlehem and a group of bezants excavated in 1942 in the manor house in the Frankish village of Parva Mahumeria (el-Qubeibeh), in the vicinity of Jerusalem.[13]

The discovery of *two* isolated site finds of gold bezants in one and the same site seems therefore remarkable. Or are they? Though rare, finds of Frankish period gold coins from within the Kingdom's territory seem to suggest that imitation bezants were part of a larger ensemble of gold denominations circulating at this period. A similar bezant was excavated in the nearby site at Mount Berenice above Tiberias, identified by Ronnie Ellenblum as the site of the late twelfth century

11 Balog, P. and Yvon, J. Monnaies a légendes Arabes de l'Orient latin. *Revue Numismatique,* 6.1 (1958):133–168; these coins are classified by Balog and Yvon as Nos. 27a–b.

12 Gordus, A.A. and Metcalf, D. M. Neutron Activation Analysis of the Gold Coinages of the Crusader States. *Metallurgy in Numismatics* 1 (1980): 119–150.

13 Hamilton, R. W. Excavations in the Atrium of the Church of the Nativity, Bethlehem. *Quarterly of the Department of Antiquities of Palestine* 3 (1934): 1–8; Bagatti, B. *I Monumenti di Emmaus al-Qubeibeh e dei Dintorni* (Jerusalem, 1947); see also: Bagatti, B. The Coins at Emmaus-el-Qubeibeh: More Evidence. *Holy Land* (1987): 8–13. Both the bezants and the cut pieces were studied and described, see: Miles, G. C. Some Hoards of Crusader Bezants. *American Numismatic Society Museum Notes* 13 (1967): 189–203 and Metcalf, D. M. Some provenanced finds of Crusader bezants. *Numismatic Chronicle* (1975): 198–199, Pl.19.

settlement of St George.[14] Other such occasional finds in surveys and excavation of Crusader towns and rural estates provide us with rare but convincing evidence for the use of these coins.[15] Finds like the small 'Flumen de Mondidier' mini-hoard or single finds of genuine al-ʿĀmir dinars from rural sites (one at nearby Tabgha, north of Tiberias, and another from Khirbet Hoga, near Ashkelon), show that genuine and imitation bezants circulated together during the twelfth century.[16] These gold bezants seem to have circulated on par with cut gold pieces issued by the kings of Jerusalem during the twelfth century, though none of these were discovered at Vadum Iacob.[17]

Excavations like Vadum Iacob indicate that gold money, both imitation and genuine dinars, circulated on a much larger scale in rural Frankish settlements than was previously thought. As for Vadum Iacob itself, the coins' provenance near its northern wall and main gate seem to indicate that they were lost by one of the castle's defenders during the final battle with the Ayyubid forces in August 1179.

**Frankish billon coins**

The second major discovery was twenty-five billon *Amalricus* type *deniers*, all excavated or found within the castle's grounds (Nos. 3–27, Fig. 17.2).

Most of the coins were uncovered in sealed contexts dating to the Frankish occupation within the castle's perimeter near the main gate area. Only a handful were excavated elsewhere — from the southeast gate and the northern, inner section of castle. The concentration of billon coins of the same type in such a small excavation area near the gate is extraordinary by any measure. These do not really fit the label of 'accidental' losses — petty coins that slipped out of their owner's hand during

**Figure 17.2.** Types of *Amalricus denier* excavated at Vadum Iacob.

14 Hirschfeld, Y. The Anchor Church at the Summit of Mt Berenice near Tiberias. *Hadashot Arkheologiyot* 101 (1994): 29–32 [Hebrew]. For the coins of the site, see: Bijovsky, G. Coins. In Y. Hirschfeld *Excavations at Tiberias, 1989–1994*. IAA Reports 22 (Jerusalem, 2004), 169–175. For the identification with the Frankish period settlement of St. George, see: Ellenblum R., *Frankish Rural Settlement in the Latin Kingdom of Jerusalem* (Cambridge, 1998), 119–120.

15 See: Castellum Haramis/Kibbutz En Hashofet (stray-find, unpublished IAA 63935); rural estate near Belinas/H. Omrit (excavation, 2006, unpublished IAA 140329); Caesarea, stray-find, unpublished IAA 21869; Jerusalem, Mamila/ medieval gate area (stray-find, unpublished, IAA 31115) and Mi'ilya (excavations, pers. comm. Rabiya 04052012).

16 For the flumen Didier mini-hoard, see: Kool, R. Finding French Deniers in the Latin Kingdom of Jerusalem: The Archaeological and Cultural Perspective. In E. Ingrand-Varenne, M. Galvez and M. Aurell (eds.) *Transferts culturels: France et Orient latin aux XIIe et XIIIe siècles 24–26 avril 2019/ Cultural Transfers: France and the Latin East in the 12th–13th centuries* (Paris, 2021b), 101–128. For Taghba, see: Loffreda, S. *Scavi di et-Tabgha*: *Relazione finale della campagna di scavi 25 marzo-20 giugno 1969*. Studium Biblicum Franciscanum, Collectio Minor 7, (Jerusalem, 1970), 174–175; Khirbet Hoga, near present day Kibbutz Dorot: the coin (IAA 73653) was collected on the site during a survey. It dates to 1117 CE. My thanks to Yaakov Huster for allowing me to mention this information.

17 Kool, R., Schindel, N., and Baidoun, I. A New Assemblage of Cut Gold Fragments from the Crusader Period. *Israel Numismatic Research* 14 (2019): 171–173. A surviving document dated to 1168 which detailed the settlers' rights in the *novo burgus* of Bethgibelin mentioned the use of bezants and gold fractions (*robuinus*) among its inhabitants. See: Delaville Le Roux, J. (ed.) *Cartulaire général de l'Ordre des Hospitaliers de St. Jean de Jérusalem (1100–1310)* (Paris, 1894), No. 399 (1168), 1: 272–273.

the life cycle of a site. In fact, the context of the coins in this area suggests that they were lost during some catastrophic event, most likely the attack on the Frankish defenders by Ayyubid forces. They were found below the collapsed remains of a barrel-vaulted structure together with equid and human skeletons that lay strewn about the Frankish living surface, alongside remains of pigs, cattle, metal tools, ceramics, and numerous Ayyubid arrow-heads.[18] A 'mini-hoard' of two *Amalricus deniers* was found here (Nos. 21–22).

All the coins, except one, belong to the good quality, heavy-weight AMALRICVS type (c. 0.80–1.17 gr) minted as a *type immobilisée* at least until 1187. The only specimen weighing below the 0.80 range is a coin now in the collection of Kibbutz Gadot, located nearby (No. 27).[19] It is a 'cut AMALRICVS type', resembling the early thirteenth-century *mauvais denier* types described in the Tripoli and Kessab hoards and excavation finds from Pilgrim's Castle.[20] However, in this case, because of the short Frankish occupation of the site, the coin definitely belongs to the late twelfth century. Possibly the bad condition of the coin was caused by its exposure to a combination of chloride salts and moisture in the upper soil, whereas the other AMALRICVS coins, buried in the burned layers below, remained virtually pristine. Might this imply that many of the low weight AMALRICVS-type coins found in hoards and excavations often dated to the thirteenth century were in fact minted in the first kingdom, up to 1187? If so, it is quite possible that these coins remained in circulation for an extended period and were *not* the product of a new mint situated in early thirteenth century Acre.[21]

The AMALRICVS single finds divide into three main stylistic groups, with a large number of sub-varieties. The main three series consist of 13 chevron-barred and nine double-barred A types, and a small group of single-barred A types (one bent coin remained illegible). The single largest group of the royal *denier* type is the double-barred A with REX followed by one centred annulet, which is also the most plentiful series in the contemporaneous Jerusalem YMCA hoard. In the YMCA pouch hoard the chevron-barred (80 specimens) and double-barred (57 specimens) are the two dominant types among the *deniers*, with a small group of triple-barred and unbarred types. The joint presence of these series does not indicate any significant functional or chronological differentiation. Also, the weights of these did not vary according to a particular series or variety but seem rather to have been kept at a fixed standard. This seems to rule out any definite conclusions about the relative chronology of these series based on the material from the Vadum Iacob excavation. Typologically, the only remarkable fact among the single finds is the absence of the chevron-barred A-with dot variety in contrast to their presence in the YMCA pouch hoard.

18 For details of the archaeological contexts see Chapter 5.

19 This coin was collected by members of the kibbutz on the tell, a number of years before the excavations.

20 Cox, D. H. *The Tripolis Hoard of French Seignoral and Crusader Coins.* Numismatic Notes and Monographs 59 (New York, 1933); Longuet, H. La trouvaille de Kessab en Orient latin. *Revue Numismatique* 4/38 (1935), 163–181; Metcalf, Kool and Berman, *Coins from the Excavations at 'Atlit*, 89–164.

21 In his re-evaluation of the Tripolis hoard, Metcalf still theorized that such low-weight coins were deliberately produced, see: Metcalf, D. M. The Metrology of the Amalricus Deniers of Jerusalem in the Early Thirteenth Century. *Israel Numismatic Journal* 14 (2000–2002), 239–244. However, the Vadum Iacob finds clearly show that heavy *Amalricus* specimens continued to be minted by Amaury's successors after 1174.

*Grosso modo*, the presence of virtually all the known series and many sub-varieties of the AMALRICVS *deniers* at Vadum Iacob shows that by the late 1170s these series were circulating simultaneously. This seems to indicate a widespread and massive penetration of the royal billon money throughout the kingdom's territory. This is backed up by data of provenanced finds from other sites.[22]

In sum, the presence of these AMALRICVS *deniers*, virtually all datable to the last days of the castle's existence (summer of 1179), seems to confirm Metcalf's observation that King Amaury's successors continued the minting of good quality, heavy weight AMALRICVS type (c. 0.80–1.17 gr) *deniers* as a *type immobilisée* after 1174, at least up to the battle of Hattin. Moreover, they possibly indicate that the AMALRICVS type was widely distributed, appearing in the kingdom's hinterland and not just in the urban and commercial centres along the coast.

Just as interesting as the dominant presence of the AMALRICVS type is the total absence of the earlier *Tower of David* billon of Baldwin III at the fortress. Presumably, by 1178–1179 these 'older' types had been called in and all but disappeared from circulation.

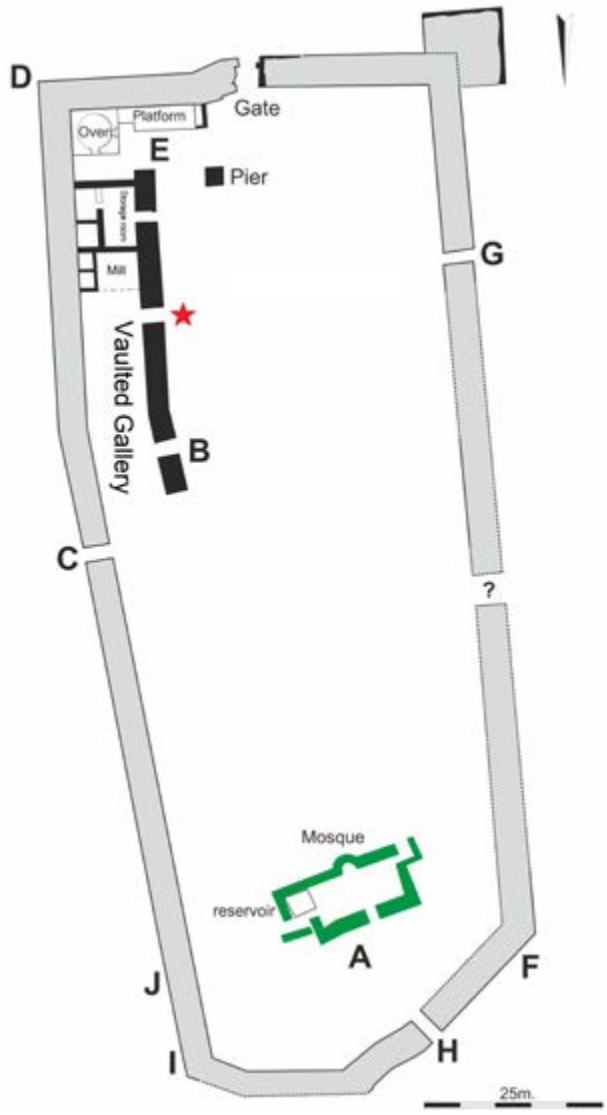



**Figure 17.3.** Fortress plan and location of excavation areas and main buildings. The red star marks the location of the hoard.

### Lead token 'money' of Vadum Iacob[23]

No doubt, among the most important numismatic finds at the castle are four unique lead *denier*-sized tokens (Nos. 28–31), three found in the main southern gate area (E) and one in the southeastern postern (G) in three seasons of excavations 1994–1996 (Fig. 17.3).

On first inspection these 'coins' seemed somewhat enigmatic since they did not fit into any of the known categories of Crusader period numismatic material. The obverse resembled an ordinary *denier* with a cross pattée surrounded by a legend. Only

22 Kool, *The Use of Coinage in the Frankish Kingdom of Jerusalem*, 181–202.

23 Based on my article: Kool, R. The Crusader Mint of Vadum Iacob: New Implications for the Minting of Coins in the Latin Kingdom during the second half of the 12th Century. In *I luoghi della moneta. Le sedi delle zecche dall'antichità all' età moderna. Convegno internazionale, Milano, Università degli Studi-22/23 ottobre 1999*, (Milan, 2001), 329–333.

**Figure 17.4.** Vadum Iacob tokens.

a few letters of the inscription were legible. The reverse in contrast clearly displayed the form and iconography of a medieval token or seal. It showed an anepigraphic blazon-type plain shield bordered by nine small annulets, positioned in symmetrical fashion around the shield. Two better preserved specimens (Fig. 17.4) were found during the third and fourth excavation seasons in 1995 and 1996, in conjunction with the group of AMALRICVS *deniers* below the remains of the collapsed structure in the main southern gate area (Nos. 30–31). These finally allowed us to decipher and reconstruct the entire legend of the 'coin-tokens'. To our astonishment, the legend read +VADI IACOB 'of Jacob's Ford'.[24]

This was the Latin name the Franks commonly used for the castle; William of Tyre writes that the castle was erected '*in eo loco qui vulgo Vadum Iacob appellatur*', alluding to the Christian tradition which identified this spot with Jacob's crossing of the Jordan to meet his brother Esau (Gen. 32:10).[25]

The tokens provide unique and unequivocal epigraphic evidence for identifying the excavated site with the stronghold of Vadum Iacob mentioned by William of Tyre. This, in itself, made them objects of great archaeological and historical importance. But these tokens contain more information. They also shed light on hitherto unknown aspects of the use of lead money in the late twelfth-century kingdom. First, a close examination of these tokens showed that they were produced by a die, and possibly two or three. The exact same positioning of the legend and cross pattée, the well-formed letters, the identical blazon and number of annulets seem to suggest that carefully crafted dies were used, like those used for minting coins. If this is correct, it deviates from the usual practice of producing lead tokens from stone-carved moulds.[26]

Recent research on lead tokens has shown that these small coin-like objects played a vital role in the emerging money-economies of medieval Europe.[27] The chronic absence of small units of money — smaller than the billon *denier* and *obole* — for daily exchange, required the widespread striking of local token money. As in the case of Vadum Iacob, these lead tokens imitated the types and iconography of the official monies that circulated in various regions of medieval Europe.[28] While

24 The inscription is written in the *genitivus locativus* commonly used on medieval coins. It is improbable that a local craftsman who produced the mould or die for these tokens mixed up the Arabic *wadi* with the Latin *vadum*, for the first signifies a water-course whereas the second distinctly carries the meaning of a 'river-crossing', which the site is, in fact.

25 William of Tyre. *Willelmi Tyrensis Archiepiscopi Chronicon.* Corpus Christianorum Continuatio Mediaevalis, 63ª. R.B.C. Huygens (ed.) (Turnhout, 1986), 997.

26 For such mould-produced tokens see: Kool, R. and Tal, O. 'Underground' Money in an *Outremer* Estate: Token Moulds and Lead Tokens from Crusader Arsur. *INR* 9 (2015), 215–228; Kool, R. and Tal, O. Another Token Mold and Lead Token from Crusader Arsur. *Schweizerische Numismatische Rundschau* 98 (2020), 215–222.

27 Labrot, J. *Une histoire economique et populaire du Moyen-Age: les jetons et les mereaux* (Paris, 1989).

28 Labrot, J. Les Mereaux languedociens de la croisade albigeoise. *Moyen Age* 29 (2002): 52–57; see also: Crusafont i Sabater, M., Labrot, J. and Moll i Mercadal, B. *Plomos y Jetones Medievales de la Peninsula Iberica* (Barcelona and Madrid, 1996), 90–91, 119–121.

a few Muslim lead token monies are known from this period, the use of lead money was undoubtedly a European custom introduced and adopted by the Frankish settlers in the Latin Kingdom during the twelfth century.[29]

The fact that these 'coins' are made of lead and that the castle existed only eleven months clearly indicates a short-lived issue, locally minted money to pay the large numbers of craftsmen labouring to complete the castle's fortifications. Alternatively, these beautifully crafted and well- struck, or cast, specimens may have had some internal use among the Templar garrison. Often numismatists have ignored or failed to grasp the extent to which this lead 'money' formed an integral part of the money circulating in the territory of the Frankish Kingdom. Most of the material was very scanty and thought to originate from larger urban settlements like Acre or Caesarea. However, the new specimens found at castles, manors, and rural strongholds shed new light on this phenomenon.[30] This material seems to indicate that some of the seignorial rulers, faced with a temporary shortage of money, attempted to circumvent the royal prerogative of coinage by minting tokens that resembled money.

**Anonymous Billon of the Latin Kingdom**[31]

One of the more intriguing coin finds of the 2002 season was a badly preserved low-grade copper *denier*, found *in situ* on the jawbone of a horse, presumably of a Frankish warrior killed by one of the dozens of arrowheads found strewn about nearby (No. 32). The coin bore an eight-pointed star on one side, usually associated with *deniers* from the county of Tripoli. A barely legible part of the legend read VIT. At first, we associated the legend with the common CIVITAS inscription of the Tripolis coins. A closer look at the coin, though, showed that this inscription type could not fit on the coin surface. Further cleaning of the legend allowed its decipherment: DAVIT, clearly affirming the find of the rare anonymous TVRRIS DAVIT, with its mixed 'star' and 'Tower of David' iconography, at Vadum Iacob (Fig. 17.5).

**Figure 17.5.** The TVRRIS DAVIT *denier*.

Until now, this anonymous copper has had a long and chequered history of attributions: More than a hundred years ago, Schlumberger tied this coin to the baronial lordship of Gerard of Sidon (1147–1165). Schlumberger also affiliated the coins with a different TVRRIS DAVIT type, presumably provenanced from Jerusalem, minted as an emergency issue during Saladin's siege of Jerusalem.[32] Finally in 1978, in a detailed article dedicated to the type, Sabine argued that these coins had been minted during Raymond III of Tripoli's regency over the kingdom of Jerusalem in 1184–1186,

29 *Plomos y Jetones Medievales de la Peninsula Iberica*: 82–83, 105–106 (see footnote 28 above), presents a few examples of such Muslim lead token money. However, these monies, imitating dirhams and gold taris, come from regions like Majorca and Sicily where European and Muslim monetary traditions mixed.

30 Kool, R. Lead Token Money in the Kingdom of Jerusalem. *Numismatic Chronicle* 173 (2013a): 293–339.

31 Based on Kool, R. From the Horse's Mouth: Re-Dating the Anonymous TVRRIS DAVIT Issue. *Israel Numismatic Research* 1 (2006): 151–156.

32 Schlumberger, *Numismatique de l'Orient latin*, 88–89.

following the sickness and death of the leper king Baldwin IV.[33] His argument was based on a combination of numismatic and historical evidence. For one thing, the numismatic evidence seemed incontestable; the iconography of the coins joined the royal symbol of the Tower of David with the eight-pointed star associated with the counts of Toulouse and Tripoli. More importantly, Sabine acquired a large number of these coins in Beirut, among them three thirteenth-century baronial *deniers* of Beirut overstruck on the same TVRRIS DAVIT *denier*. This evidence fit well with the historical information provided by the Old French continuations of William's chronicle, which mentioned Raymond's claim to Beirut as a prize for the regency.[34] Other scholars, like Edbury and Metcalf, have adopted Sabine's theory.[35]

Our find, however, securely dated to the destruction of the castle in August 1179, six years before Raymond's regency, clearly abrogates Sabine's 1184–1186 'Beirut issue' explanation. Moreover, data from recent excavations and stray finds indicate that the TVRRIS DAVIT type did not solely circulate in the north as was previously thought; they are found also in the Kingdom's heartland towns and in the cities of Jerusalem, Jaffa and Caesarea.[36] How then do we explain the sudden presence of this anonymous type at Vadum Iacob? Could it have been an anonymous royal issue minted either before or during the reigns of Baldwin III or Amaury I? This is highly unlikely, if we consider that the kings of Jerusalem struck their own issues on which their names clearly appear. And why would they issue a royal coin with a Tripolitan heraldic symbol? Could it have been a Tripolitan issue? Here the same argument also applies: why would the counts of Tripoli — who had their own extensive coin issues — mint an anonymous type with a royal symbol?

The answer lies in closely rereading the political events as witnessed by contemporary sources, especially William of Tyre. Upon the death of Amaury I on July 11, 1174, William related, his son Baldwin IV was crowned king.[37] However the boy-king was only thirteen years old and already stricken by leprosy. Miles de Plancy, a favourite of the late king, presumably usurped the regency, against the objections of a group of powerful nobles lead by Count Raymond III of Tripoli.[38] With the assassination of Miles in Acre, the High Court of the kingdom granted Raymond III the regency which he held till 1177. Presumably it is during this first regency (1174–1177), and not the second one (1184–1186) as Sabine argued, that the TVRRIS DAVIT coins were minted. Certainly, Raymond III seems a good candidate for having issued these 'regency' coins at that point in time. As ruler of Tripoli, he was no stranger to minting his own coins, and as lord of Tiberias and the king's most powerful vassal he no doubt had the political clout to mint coins that combined royal and baronial iconography. And there may have been more practical reasons for the supply of these

33 Sabine, C. The Turris Davit Coinage and the Regency of Raymond of Tripoli (1184–1186). *Numismatic Chronicle* 7/18 (1978): 85–92.

34 Riley Smith, J. *The Feudal Nobility and the Kingdom of Jerusalem (1174–1277*) (London, 1973), 107–108, especially note 27.

35 Edbury, P. The Baronial Coinage of the Latin Kingdom of Jerusalem. In P. W. Edbury, and D. M. Metcalf (eds.) *Coinage of the Latin East* (Oxford, 1980), 61; Metcalf, *Coinage of the Latin East*, 87–88.

36 Excavation data collected for my PhD research. Recently five stray-finds *of Turris Davit* coppers were made in the region between Nazareth and Tiberias. I am indebted to Ariel Berman, my mentor and colleague, for this information.

37 William-of-Tyre, 21.2.

38 Riley Smith, *The Feudal Nobility and the Kingdom of Jerusalem*, 101–102.

small coins: under his regency, the kingdom waged several military campaigns to undermine Saladin's growing power. It is possible that the frequent mobilization of the kingdom's forces overextended the existing royal issues in circulation, and there was a need for new issues to be minted. Interestingly, no coins of another controversial anonymous issue, the MONETA REGIS *deniers*, were found at the site, but these coins have been found at several sites located within 20 km of the castle.[39] Could it be that these anonymous 'royal' coins were somehow related to the Turris Davit issues of Raymond's regency and were not, as Metcalf proposed, minted in Acre, before Baldwin III's reform of 1140?[40]

**European billon**

Right up to the last stages of the excavations, no other billon coins except for the royal *Amalricus* types were found. But during the 2002 excavation season another billon *denier* was found together with the TVRRIS DAVIT *denier*. This one turned out to be the Chrismon and cross billon *denier* minted by the bishops of Le Puy in Languedoc (No. 33). These small *pogesi,* worth half of a billon *denier*, circulated very early in Frankish territory, from the First Crusade onwards.[41] Data from excavations show that these coins circulated in large parts of the Kingdom's territory, in towns as well as smaller settlements: from Tell Jemmeh, south of Gaza up to Banias in the north. Hoard evidence registers their presence up to 1187 and they possibly remained in circulation beyond that, during the Third Crusade.[42] The precise date of our coin, combined with now available data of parallel finds from other excavated Frankish sites in the vicinity of Jerusalem, Tiberias and Banias securely dated to the twelfth century, leaves no doubt that these coins were still actively circulating as money in the Kingdom of Jerusalem in the late 1170s-1180s.[43]

**Zanjid and Ayyubid** *Fāls*

The combination of a well-dated archaeological context and abundant historical sources furnishes us with precise knowledge on the sequence of events at the castle within a very limited period (less than a year). Muslim coins appearing with rulers' names and dates further provide us with exact tools to distinguish which of these coins were used during the Frankish occupation (1178–1179) and which during the Ayyubid settlement thereafter, up to the second half of the thirteenth century. Four Zanjid coins minted under Nūr al-Din at Damascus (1146–1174) were found at the site (Nos. 35–38). Two of them belong to a Frankish context: one coin was found with four AMALRICVS coins in the burnt remains of a Frankish period living surface. Another coin was found in a collapsed vaulted area adjoining the main gate. A third

39 Three hoards containing 'Moneta Regis' deniers were found in the vicinity of Vadum Iacob. Seven deniers were discovered in a lump near the ruins of a fortified building at Qalʿat esh-Shūna (Nahal ʿAmud). Another five deniers and an obole were found in a lump at Capernaum. Four additional deniers in a corroded lump were excavated at the Frankish citadel of Beth-She'an. See: Spijkerman, A. *Cafarnao* III**:** *catalogo delle monete della città* (Jerusalem, 1975), 47–48; Rahmani, L. Y. Two Hoards of 'Moneta Regis' Coins Found in Northern Israel. *Israel Numismatic Journal* 4 (1980): 72–76; Berman, A. The Numismatic Finds from the Citadel. *Hadashot Arkheologiyot* 103 (1993): 38–42 (Hebrew).

40 Metcalf, *Coinage of the Crusades,* 76–77.

41 These coins were included by Raymond of Aguilers, the chaplain of Raymond of St. Gilles the count of Toulouse, among the seven 'preferred currencies' used by the Crusaders on the First Crusade.

42 Kool, R. A Fatimid Amulet-Box with European and Islamic Coins from the Eleventh Century. *American Journal of Numismatics* 11 (1999), 62; Kool, R. The Crusader Purse from Tell Jemmeh. In D. Ben-Shlomo and G. W. Van Beek, *The Smithsonian Institution Excavation at Tell Jemmeh, Israel, 1970–1990* (Chicago*,* 2014), 1026–1030.

43 This conclusion is based on still-unpublished medieval-provenanced coin finds documented in my research database.

specimen was excavated from the remains of the medieval settlement built after the destruction of the castle, while a fourth was collected as a stray find. Zanjid coppers are regularly found in other Frankish period sites and appear to have circulated abundantly in Frankish-held territory, evidence of the fluid economic co-existence with neighbouring Muslim-ruled territories. Apparently these *fulūs* were used as small change together with *deniers* in Frankish rural and urban settlements.

The site also yielded a considerable quantity of Ayyubid copper *fulū*s and several dirhams, all from the extremely active mints of Damascus and Aleppo (Nos. 39–59). These coins also seem to have circulated in settlements in the kingdom during the thirteenth century, appearing as stratified finds, as attested by the assemblage excavated in the faubourg of Pilgrims' Castle.[44]

A good example is the thirteenth century silver Ayyubid dirham (No. 54) found on the floor of the Ayyubid period mosque built on the remains of a church (?) constructed by the Templars in the castle's northern section.[45] How did Ayyubid coinage become part of the money system of the Kingdom of Jerusalem? Was this a gradual process, which started during the 1170s-1180s before Saladin conquered most of the Frankish territory? Or did this transpire with the sudden demise of royal authority following the defeat at the Horns of Hattin? The finds at the castle seem to favour the latter scenario. Except for one coin, dating to Saladin's early rule under the overlordship of the Zanjid ruler al-Ṣāliḥ Ismāʿīl (1174), all the Ayyubid coins *postdate* the destruction of Vadum Iacob. This excludes their use during the short Frankish occupation of the site. Saladin started minting coppers in his own name at the mints of Damascus and Aleppo in 1174, five years before the destruction of the castle. If Ayyubid coins did circulate in Frankish settlements, they certainly would have been present at the castle, located relatively close to Ayyubid territory. As it stands, the bulk of the Ayyubid money from Vadum Iacob was minted after 1195, more than fifteen years after the site was destroyed by Saladin's army. This also excludes the possibility that this money was used by the soldiers of the Ayyubid host. Presumably the outbreak of plague at the castle three days after the final battle, and the resulting hasty departure of the Ayyubid army, left too little time for a significant number of stray coin losses by the Ayyubid soldiers. Clearly, the coins date to the period when the destroyed castle was re-occupied by villagers at the beginning of the thirteenth century. Coins of al-ʿAzīz ʿUthmān (1195–1198) and al-ʿĀdil (1199–1218) were discovered in the remains of houses constructed adjacent to the east wall. Most of the other Ayyubid period coppers were found in nearby areas. The latest datable coin belongs to the last part of the reign of the Ayyubid ruler of Aleppo, al-Nāṣir Ṣalāḥ al-Dīn Yūsuf II (1242–1258).

**Mamluk period coins**

The numismatic material shows that the Ayyubid settlement continued without interruption into the Mamluk period, as shown by the presence of coins of Qalāʾūn (1279–1290) and al-Ashraf Khalīl b. Qalāʾūn (1290–1293; Nos. 60–61). Most of the material belongs to the fourteenth century, but the stray finds of *fulūs* of the sultans al-Ashraf Īnāl al-Alāʾī al-Ẓāhirī (1453–1461) may indicate that a local settlement remained active till deep into

44 Metcalf, Kool and Berman Coins from the Excavations of 'Atlit

45 See this volume, Chapter 4.

the Mamluk period (No. 78). Several fourteenth century coins, among them a coin from al-Nāṣir Muḥammad b. Qalāʾūn's third reign were found in the mosque/tomb structure but provide no conclusive dating for the structure.

**Ottoman period coins**

Four small silver coins, all dating to the eighteenth and nineteenth centuries, were excavated on the castle grounds (Nos. 86–89). Three *paras* dating to the reign of sultan Aḥmad III (1703–1730) were found together in Area G, possibly as components in a piece of jewellery. The fourth coin, an *akçe*, dates to the reign of Maḥmūd II (1808–1839).

**Conclusions**

The coins recovered at Vadum Iacob provide new and crucial information about hitherto unknown aspects of coin circulation in the Frankish kingdom. First, the presence of royal gold and billon in military outposts, and possibly in rural sites, was much more widespread than previously thought. Secondly, European *deniers* continued to circulate in the territory of the kingdom virtually without a break from the twelfth into the thirteenth century. Thirdly, the find of a rare TVRRIS DAVIT copper at Vadum Iacob re-dates this issue to the first regency of Raymond of Tripoli (1174–1177) and is possibly connected another rare anonymous MONETA REGIS issue discovered at sites in close geographical proximity to Vadum Iacob. Fourth, seignorial rulers started, already in the twelfth century, to mint lead money in order to circumvent the royal prohibition of minting money, as the VADI IACOB tokens undeniably show. And fifth, the appearance of Muslim petty coinage in Frankish period sites must be acknowledged. To what extent this was a widespread phenomenon needs to be studied further. The material at Vadum Iacob seems to indicate that Zanjid *fāls* were used during the Frankish occupation whereas the Ayyubid coppers found there must have circulated later, after the site was re-settled by villagers.

## The Denier Purse of Vadum Iacob

Among the more captivating archaeological finds at the castle of Vadum Iacob was the discovery of a purse of Crusader money in the southern part of the castle grounds during the 2007 excavation season. The hoard, some 164 silver *deniers*, was discovered on the remains of a burned human skeleton and is remarkable material evidence of the ferocious battle that ensued on Thursday, 29 August 1179. The written accounts relate that the Ayyubid forces breached the walls of the half-finished battlements of the fortress, defended by some 1500 men, builders, and artisans, among them a garrison of 300 members of the Templar Order. They give ample details of the battle and resulting massacre: Saladin's army killed more than half of the Frankish inhabitants, some 800 men. The survivors, among them Templar knights and foot-soldiers, as well as archers employed in the building of the castle were either beheaded at the site, on the personal order of Saladin, or went into captivity.

Much of the accumulated material evidence from the excavations, especially in the southern part of the castle, gives dramatic proof of the fierce battle that followed once the Ayyubid soldiers forced an entry into the castle and fought the


**Figure 17.6.** The four partly burned human skeletons that were unearthed below collapsed stones (Area E, L115, B1021).

remains of the Templar garrison near the main gate and adjoining structures.[46]

**Finding the hoard (2007)**

Excavations in October 2007 near a vaulted series of rooms running along the eastern fortress wall underlined once more the intensity of the battle and destruction of Vadum Iacob. In what proved to be an entrance into one of the vaulted rooms (Area E, L115), four partly burned human skeletons were unearthed (Figs. 17.3 and 17.6), buried below collapsed stones that had fallen from the western wall of the vault.[47] Interspersed with these *dramatis personae* were the burned remains of pigs, lying in a thick layer of ash next to a large basalt grindstone. The four humans, all adult males, numbered H1–H4, were lying in a variety of positions with outstretched limbs among the burned debris, stones,

46 For more details, see Chapters 7–9. Signs of traumatic death were everywhere: arrowheads sticking into bones, the random orientation of bodies and limbs, signs of terrible battle wounds, horses killed by armour- piercing arrows, and flat arrowheads that caused fatal injuries.

47 Regarding the skeletons, see Chapter 9.


**Figure 17.7.** Skeleton H1 lying in an outstretched position.

**Figure 17.8.** Preliminary reconstruction of H1 cranium with multiple slicing.

conflagrated wooden beams, and arrowheads (Figs. 17.7–17.8).[48]

Two of the males lacked skulls (H2 and H3). One young adult male's cranium displayed considerable signs of trauma. His reconstructed skull revealed multiple slicing wounds, three of which penetrated the bone. Presumably these individuals were killed during the battle, after which their corpses with the dead pigs were partially burned and buried under collapsed stones.

These discoveries in the courtyard, though important, did not deviate *grosso modo* from previous finds made in earlier seasons. They just reconfirmed in graphic detail the bloody battle that took place within the walls. But then a surprise find was made on the decapitated remains of one of the humans: H2. As his skeleton was carefully excavated by the team's zooarchaeologist, Hadas Motro, and the IAA anthropologist, Yossi Nagar, a lump of metal surfaced near his left upper arm bone or *humerus*, close to his chest (Fig. 17.9).

What appeared was a corroded lump of thin medieval *denier*-type coins. As the sides of H2's arm bone were carefully cleaned, more coins appeared, until an entire coin assemblage was exposed (Figs. 17.10–17.11). One could clearly see the coins were stacked in a 'rouleau', a roll of coins preserving the shape of the money bag or purse which did not survive.[49]

48 Clearly, these were not burials, as the skeletons were found in random positions, either with arms spread or lying on their sides under the debris of the vault.

49 A similar find of coins lumped in a *rouleau* —also mostly Amaury deniers — was made at Tell Yavneh/Ibelin in 2009. See: Kool, R. and 'Ad, U. A Late Twelfth-Century Silver Purse Hoard from Ibelin. *Israel Numismatic Research* 11 (2016): 163–180.

**Figure 17.9.** Zooarchaeologist Hadas Motro and IAA anthropologist Yossi Nagar excavating H2.

**Figure 17.10.** Close-up of the coin hoard.

**Figure 17.11.** The appearance of a corroded stack of thin medieval *deniers* near the left upper arm bone of H2.

**Figure 17.12.** (left) *Rouleau* or roll of coins preserving the shape of the money bag or purse.

**Figure 17.13.** (right) First spread-out of the hoard.

**Figure 17.14.** (left) A first examination of the hoard at the fortress, by the author (Summer, 2007).

**Figure 17.15.** (right) Close-up of the coin hoard.

Finally, with the uncovering of the entire arm bone the treasure disintegrated into large and small chunks of coins, about 34 units (Figs. 17.14–17.15).

**Contents of the hoard**

Cleaning and treatment of the coins revealed the hoard to contain some 164 billon *deniers*.[50] The contents of the purse are homogenous and consist almost solely of small thin royal AMALRICVS *deniers*. These coins, depicting the open roofed rotunda of the Church of the Holy Sepulchre, with the inscription AMALRICVS REX were introduced by King Amaury in the 1160s, some sixteen years before the destruction of Vadum Jacob, and continued to be minted by his successors up till the Battle of Hattin (1187). The only other coin in the hoard is a single 'conical helmet' type *denier* minted in Antioch in the name of Bohemond III (1163–1201). This coin formed part of the most prolific Crusader billon series, minted continuously by the rulers of Antioch for some 120 years (1150–1268).[51] This particular variety was previously dated on the basis of typological studies and hoard evidence to between 1163–1188 and fits very well with the dating now provided by Vadum Iacob.[52] Only a few of these Antiochene billon and copper *deniers* have appeared in excavated sites in the territory of the Latin Kingdom over the past eighty years.[53] It is telling evidence of how billon and copper money struck in mints of the Crusader states in large quantities circulated mostly locally in each of these territorial states.

Billon hoards like these are exceptional finds within the historical borders of the Latin Kingdom of Jerusalem. Very few are found in excavations. Hoards with Amaury coins are even rarer and usually contain very small quantities of twenty-five coins or less.[54] Larger caches of AMALRICVS *deniers* were found north of the kingdom's borders, in the territories that historically belonged to the principalities of Tripoli and Antioch.[55] But these contained degenerated '*mauvais*' Amaury *deniers* minted after the demise of the first kingdom in 1187, and bear no relevance to heavy 'good' *deniers* circulating in the kingdom prior to 1187, like our specimens.

**What the hoard tells us**

Apart from showing us that one of the defenders of Vadum Iacob held on to his purse in death, the importance of the hoard lies in three types of information it provides: evidence about the last moments of the castle; information about the daily use of money in a frontier castle in the Latin East; and finally, data about the scale of the monetary economy in the Kingdom of Jerusalem prior to 1187.

---

50 The coins were expertly cleaned and treated by Mimi Lavie, Head of the Conservation Laboratory, Institute of Archaeology at the Hebrew University of Jerusalem, and by Ariel Berman.

51 Metcalf, *Coinage of the Latin East*, 117.

52 The denier is a +BOAMVNDVS/+AMTIOCNIA Class B/C (?) with dotted A M, N, of the main series issued between 1163–1188. See: Metcalf, *Coinage of the Latin East*, No. 377.

53 Only 14 such coins from nine excavated or provenanced sites were registered in the IAA Coin Database.

54 For an updated list of such Amaury hoards, see my Appendix 1: A Checklist of Finds on the 'Heavy' Amaury Denier. In Kool, *The Use of Coinage in the Frankish Kingdom*, 213–229, Nos 1, 14, 19, 21, 29–30, 32, 43, 52, 58, 61.

55 Large hoards were found at Tripoli and Kessab (south of the Orontes). See note 21 above for references.

## The purse and the last moments of the castle

The dramatic context in which the purse was found and preserved — a relatively large sum of *deniers* on an individual killed during the battle for the castle — evidently suggests the *suddenness of the catastrophe* that befell the Frankish defenders. It is now clear that precious little time elapsed between the final breakthrough of the Muslim forces on the fourth day of the siege and the capture and death of many of the Frankish defenders. With Ayyubid forces pouring into the castle, the defenders had no time to conceal their money and possessions. The sudden, almost Pompeii-like destruction of the castle and its inhabitants and its preservation — the castle was quickly abandoned soon after the final battle due to the outbreak of plague — is also evoked by the relatively large number of stray finds of similar *deniers* found among the corpses and animals concentrated in the main gate area.[56] Secondly, the hoard provides sound evidence for the identity of the dead person on whose body the coins were found. A purse filled with Crusader money indicates he certainly was one of the fortress' defenders, possibly a Templar knight, sergeant or one of the many craftsmen brought to build the castle. Historical sources clearly note the methodical stripping of the dead of anything valuable as a regular part of the battlefield ritual. Al-Fāḍil, Saladin's administrator, boasted of massive quantities of booty taken from the dead and captured Franks at the castle.[57] For some unknown reason, the Ayyubid soldiers overlooked the purse of this Frankish defender, before his corpse was thrown into the courtyard area strewn with other dead bodies and cadavers of pigs.[58]

### The purse and daily use of money in the Latin East

Several coins of the purse showed remains of textile fibres. Analysis of the attached fibres showed them to be cotton which, in contrast to Western Europe, was relatively available in the Frankish East and Muslim-ruled Syria (Figs. 17.16–17.17).[59]

**Figure 17.16.** (left) Remains of cotton attached to the deniers.
**Figure 17.17.** (right) Close-up of the threads that belonged to the purse.

We presume these were remnants of the bag or purse which contained the hoard. Remains of a such a pouch is also confirmed by the above-mentioned

56 Kool, R. Coins at Vadum Jacob: New Evidence on the Circulation of Money in the Latin Kingdom of Jerusalem during the Second Half of the 12th Century. *Crusades* 1 (2002), 73–88.
57 Abū Shāma, *Kitāb al-rawḍatayn* vol. 3: 37.
58 It is quite possible the purse had been concealed by its Frankish owner under the garment he wore. Depending on his rank, this could be either a simple tunic, or, if he was a member of the Templar garrison at the castle, a shirt or garment worn beneath one's hauberk, as required by the Order's rule. See Upton-Ward, J.M. (trans.) *The Rule of the Templars: The French Text of the Rule of the Order of Knights Templar* (Woodbridge, Suffolk, 1992), 53, No. 138.
59 Cotton was widely available in the medieval East from the tenth century onwards. Ashtor, E. The Venetian Cotton Trade in Syria in the Later Middle Ages. *Studi Medievali* 17 (1976): 675–715.

*rouleau* form of the coins, preserving the purse's contours. Most purses during this period seemed to have been girdle purses strapped on a belt or cord worn around the waist. In our case, the find of a roll of coins, higher up the body near H2's armpit, seems to indicate that the coins were held in a purse hanging from this person's shoulder. Similar finds of Frankish coins in corroded lumps indicate the frequent use of purses and money bags or *bursa*, in the Frankish East.[60] In contrast, larger amounts of money were transported or collected *in archam*, a money chest.[61]

A note of caution should be offered here, as the excitement of finding such a rare 'treasure' often leads to hyperbole about its value. The value of this purse with some 164 royal *deniers* was the equivalent of several gold bezant pieces. This was a substantial sum of money, though no real 'treasure', compared to a huge hoard of some 4000 *deniers* apparently associated with warfare at the strategically positioned fortress of Harenc/Harim between Aleppo and Antioch in the 1150s-1160s.[62]

The combined evidence of the hoard and abundant single finds on the site show that royal Amaury *denier* money was plentiful at this frontier castle, even though it was located at considerable distance from the main urban and trade centres of the kingdom. Building such a fortress was an expensive undertaking and had to be financed initially from the king's own treasury and by the Templars, as Ronnie Ellenblum rightly noted.[63] Undoubtedly, the concentrated finds of these royal *deniers* in the castle grounds reflect the large amounts of money spent to sustain the six-month-long presence of the king and his large army, and thereafter the Templar garrison, and a substantial working force that had to be paid and fed while building the castle.

Consider that the daily wages of one building team of twenty-four masons, carpenters, blacksmiths, assistants and labourers is conservatively estimated at more than 60 *deniers* a day, possibly the equivalent of 120 AMALRICVS *deniers* or more — which translates into roughly 40,000 AMALRICVS *deniers* for a period of 11 months.[64] Now imagine a large number of such teams, made up from the hundreds of artisans and soldiers, and it would be no exaggeration to assume that the wages spent on the construction of the fortress ran into millions of *deniers*. Indeed, Muslim sources did not exaggerate when they estimated that the building

60 For finds of such rolls of deniers, see Metcalf, The Jaffa Hoard of 1954: Crusader Coinage of the late 12th Century. *INJ* 15 (2003–2006): 138; Kool, The Crusader Purse from Tell Jemmeh*,* 1026; Kool and 'Ad, A Late Twelfth-Century Silver Purse Hoard from Ibelin, 167; Metcalf, Kool and Berman, Coins from the Excavations of 'Atlit, 102–104.

61 William of Tyre mentioned that the large sums of money raised in a special defence-tax in 1183 were collected in money bags and thereafter deposited in larger chests (*arcae*) with three lock-keys in treasuries at Acre and Jerusalem. See: William of Tyre, 1046. See also: Kedar, B. Z. The General Tax of 1183 in the Crusading Kingdom of Jerusalem: Innovation or Adaptation. *English Historical Review* 89 (1974): 339–345.

62 The Harim/Harenc hoard discovered in 2007 in North Syria contained nearly 4000 deniers. Possibly deposited around 1164, it contained massive quantities of deniers of the northern principalities, West European/French deniers and even BALDVINVS REX deniers (personal communication, M. Philips, 28 August, 2020). For the involvement of Baldwin III in the warfare around this strategically located fortress in 1149, 1157/1158 and 1164, see: Buck, A. D. The Castle and Lordship of Ḥārim and the Frankish-Muslim Frontier of Northern Syria in the Twelfth Century. *Al-Masāq — Journal of the Medieval Mediterranean* 28/2 (2016): 121–124.

63 Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007), 266–267.

64 Shotten-Hallel, V. and Kool, R. What Does It Take and Exactly How Much? Building a Church in the Latin Kingdom of Jerusalem in the Twelfth Century. In M. Sinibaldi, K. J. Lewis, B. Major and J. A. Thompson (eds.) *Crusader Landscapes in the Medieval Levant*: *The Archaeology and History of the Latin East* (Cardiff, 2016), 299.

expenses alone for the castle cost between 60,000 to 80,000 gold dinars.[65] Such a sum was the equivalent of almost four to five and half million AMALRICVS *deniers* by the current exchange rate of gold to silver in the twelfth century.[66] With the arrival of the Templar garrison, additional investment into provisions and arms at the castle were estimated to have cost another 40,000 dinars.[67]

### The Monetary Economy in the Kingdom of Jerusalem Prior to 1187

The importance of the well-dated contents of this purse lies, above all, in what it tells us about the monetary economy of the Latin kingdom in the last two decades before the catastrophic battle at Hattin in 1187. As mentioned above, its contents are made up exclusively of good weight royal AMALRICVS *deniers* of the type introduced by King Amaury after he succeeded his brother, Baldwin III, to the throne of the kingdom in 1163. Comparison of the purse's contents with the single finds from Vadum Iacob — again all, except two, coins of the same royal *denier* type — convincingly shows that this royal *denier* type continued to be struck under Baldwin IV (1174–1182) as a *type arrestée* and without doubt remained the principal petty billon coin circulating in Frankish sites up to 1187. The importance of such a royal petty currency started under Baldwin III (1143–1163), who introduced the first massively struck Frankish *denier* in the kingdom, the REX BALDVINVS *denier* with the emblematic 'Tower of David' functioning as the citadel of Jerusalem on its reverse, possibly after he had dislodged his powerful mother, Queen Melisende, from her position as regent of the kingdom in 1152.[68] The total absence of these coins at Vadum Iacob by the late 1170s — in contrast to their massive presence in the abovementioned Harenc hoard dated to the 1160s[69]—shows that these coins were taken out of circulation, melted down and re-minted into the much larger AMALRICVS issues after 1163. Such a *renovatia moneta* teaches us about an important political-economic reality: the existence of

65 The qadi al-Fāḍil, Ṣalāḥ al-Dīn's administrator, noted in a letter addressed to the Abbasid caliph al-Mustaʿdī in Bagdad that just the 20,000 dressed stones used in the construction of the castle must have cost four dinars each, or more. Another now lost chronicle, by Ibn Abū Ṭayy, noted that the sultan was prepared to pay 60,000 dinars for the castle's construction costs if they handed it over to him. Both sources were quoted by the thirteenth-century Damascene chronicler Abū Shāma in his account of Ṣalāḥ al-Dīn's reign. For the references to these sources see Ellenblum, *Crusader Castles*, 267–268 and Barber, M. Frontier Warfare in the Latin Kingdom of Jerusalem: The Campaign of Jacob's Ford, 1178–1179. In J. France and W. G. Zajac (eds.) *The Crusades and their Sources*: *Essays Presented to Bernard Hamilton* (Singapore and Sydney, 1989), 9–11.

66 The gold-silver exchange ratio during this period was 1:13; see: Goitein, S. *A Mediterranean Society: The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza, Volume* I: *Economic Foundations* (Berkeley, California, 1967), 368 ff. (Appendix D: The exchange rate of gold and silver money). Thus, one standard dinar of approximately 4.2 g equalled c. 35.6 grams of pure 93% silver, which translated to c. 70 deniers of one gram with a standard purity of 50%.

67 This is based on Saladin's offer to increase the sum to 100,000 dinars to indemnify the Templars for arming and provisioning the fortress; see: Ellenblum, *Crusader Castles*, 267.

68 From the Fatimid period this massive tower, strategically positioned, constituted the main fortification allowing whoever controlled it to rule over Jerusalem. In the twelfth century, the tower now under royal control was the centre of royal administration in the city, possibly even where a royal mint was located. See: Boas, A. *Jerusalem in the Time of the Crusades*: *Society, Landscape and Art in the Holy City under Frankish Rule* (London, 2001), 73–76. Its appearance on the coinage of Baldwin III is thus no coincidence. Moreover, besides its symbolic value — its supposed connection to the biblical rule of king David — Baldwin also possibly had personal and political reasons to depict the tower on his coinage. It marked his reign as sole ruler of the kingdom after he regained control of the tower in 1152 from his mother, the dowager queen, who had occupied it.

69 The hoard, which seems to have been lost around 1164 when Nūr al-Dīn defeated a coalition of Christian forces at Harenc/Harim, contained more than 520 Baldwin III deniers, but only a mere six Amaury deniers. It shows that early in Amaury's reign, Baldwin deniers were still widely circulating.

a royal administration strong enough to push through monetary reforms and enforce an exclusive uniform 'latinized' billon coinage throughout its territory.[70] The continuous use of the same large regular flans and inscriptions on the coins, a standard alloy (c. 40–50% silver) and the maintenance of fixed weight standards, show a strong royal tax administration in place at least until the collapse of the kingdom's army at the Horns of Hattin.

The micro-analysis of the types of *deniers* from the well dated purse and single finds at Vadum Iacob, and their comparison with finds from other sites, also elicits several important conclusions: a preliminary estimation of the virtual lack of repetition of obverse dies seems to indicate a very large volume of coins, possibly estimated in the tens of millions, produced between 1163 and 1187.[71] No geographical concentration of a particular sub-type was observed. This *could* indicate the existence of multiple workshops active simultaneously. The geographical density and distribution of the royal *denier* clearly suggest that it was a 'local' money, limited to the Kingdom of Jerusalem. Finds from good archaeological contexts, such as those at Vadum Iacob, show clearly the penetration of this royal billon, far and wide, into the daily economy of the kingdom.

Michael Metcalf wrote with typical understatement in his *Coinage of the Latin East* in 1995, that "finds from the excavations of the castle of Chastellet…will be of much interest…" Indeed, they are.

70 Kool, *The Use of Coinage in the Frankish Kingdom of Jerusalem 1099–1291*, 78–88.

71 Metcalf estimated the number of the preceding, considerably smaller REX BALDVINVS issue at circa 11–12 million coins. See Metcalf, Describe the Currency of the Latin Kingdom of Jerusalem, 189–198.

# CATALOGUE
## Single Finds

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LATIN KINGDOM OF JERUSALEM<br>Royal imitation of Fatimid Dinar of Al-Amir<br>(495–524 AH/ 1101–30),** *Bezant* | | | | | | | | | | | | | |
| 1 | 860 | 860 | 8521 | 3.82 | 22 | | In center:<br>الامام<br>المنصور<br>Inner and outer: unintelligible Arabic concentric inscriptions | In center:<br>عال<br>غاية<br>Inner and outer: unintelligible Arabic concentric inscriptions | 1130s — 1179 | Jerusalem or Acre? | Metcalf 1995: 124 Balog and Yvon 1958: Nos. 27a; Cf. Nicol 2006: 335, type A. | Reddish glow; annulets between inner rings. | 73096 |
| 2 | F | North wall | 7008 | 3.79 | 22 | | Same | Same | Same | Same | Same 27b. | Whitish; rough script. | 107776 |
| **LATIN KINGDOM OF JERUSALEM<br>Amaury I, 1163–1174 CE,** *Denier series — chevron type A* | | | | | | | | | | | | | |
| 3 | E | 803 | 8515 | 1.04 | 18 | | ✝ĂMĂLRICVS RЄX<br>Cross pattée; annulets in two and three | ✝ DE IñRVSaLñM<br>Church of the Ressurection | 1163–1179 | Kingdom of Jerusalem | Kool 2013: 231, No.1.1.1.1 | RЄX with annulet | 73089 |
| 4 | E1 | 520 | 5126 | 1.02 | 17 | | Same | Same | Same | Same | Same | Same | 74249 |
| 5 | E1 | 520 | 5123 | 0.94 | 17 | 2 | Same | Same | Same | Same | Kool 2013: 231, No.1.1.2.1 | RЄX with two annulets | 74248 |
| 6 | E1 | 526 | 5131 | 0.85 | 17 | 10 | Same | Same | Same | Same | Same | Same | 74255 |
| 7 | E1 | 520 | 5130 | 0.94 | 18 | 4 | Same | Same | Same | Same | Kool 2013: 231, No.1.1.3.1 | RЄX with three annulets | 74251 |
| 8 | E1 | 520 | 5135 | 1 | 17 | 7 | Same | Same | Same | Same | Same | Same | 74253 |
| 9 | G | 220 | 2219 | 0.83 | 18 | | Same | Same | Same | Same | Kool 2013: 231, No.1.1.4.1 | RЄX with stop | 73062 |
| 10 | G | 220 | 2220 | 0.94 | 17 | | Same | Same | Same | Same | Same | Same | 73063 |
| 11 | E1 | 520 | 5129 | 0.99 | 18 | 3 | Same | Same | Same | Same | Same | Same | 74250 |
| 12 | A | Surface | | 1.17 | 18 | | Same | Same | Same | Same | Same | Same | 107773 |
| 13 | | Surface | | 0.96 | 18 | | Same | Same | Same | Same | Kool 2013: 231, No.1.1.8.1 | RЄX without stop | 107772 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Denier series — double-barred A* | | | | | | | | | | | | | |
| 14 | E | 801 | 8029 | 0.83 | 18 | | Same | Same | Same | Same | Kool 2013: 231, No.3.1.4.1 | RЄX without stop | 107774 |
| 15 | E | 870 | 8561 | 0.86 | 18 | 5 | Same | Same | Same | Same | Same | Same | 73101 |
| 16 | E | 873 | 8570 | 0.90 | 18 | 6 | Same | Same | Same | Same | Same | Same | 73106 |
| 17 | E | 874 | 8580 | 0.94 | 18 | 10 | Same | Same | Same | Same | Kool 2013: 231, No.3.1.1.1 | RЄX with annulet | 73109 |
| 18 | E | 874 | 8580 | 0.85 | 18 | 6 | Same | Same | Same | Same | Same | Same | 73110 |
| 19 | E1 | 520 | 5133 | 0.99 | 18 | 9 | Same | Same | Same | Same | Same | Same | 74252 |
| 20 | E | 803 | 8018 | 1.05 | 17 | | Same | Same | Same | Same | Same | Same | 107775 |
| 21 | E | 700 | 7002 | 1.04 | 17 | | Same | Same | Same | Same | Same | Same | 107807 |
| 22 | E | 700 | 7002 | 0.87 | 17 | | Same | Same | Same | Same | Same | Same | 107808 |
| *Denier series –single-barred A* | | | | | | | | | | | | | |
| 23 | E1 | 408 | 4014 | 0.82 | 19 | | Same | Same | Same | Same | Kool and Ad 2016: 176, No.47 | RЄX without stop | 73078 |
| 24 | E | 873 | 8570 | 0.89 | 18 | 5 | Same | Same | Same | Same | Same | Same | 73105 |
| 25 | E | 271 | 2231 | 0.92 | 17 | 7 | Same | Same | Same | Same | Kool and Ad 2016: 176, No.46 | RЄX with annulet | 145667 |
| *Denier series — unidentifiable* | | | | | | | | | | | | | |
| 26 | A | W150 | 15014 | 1.02 | 18 | | Same | Same | Same | Same | | | 74284 |
| 27 | | Stray-find | | 0.7 | 16 | | Same | Same | Same | Same | | | 31941 |
| **Lead Token money of Vadvvm Iacob** | | | | | | | | | | | | | |
| 28 | G | 213 | 2185 | 3.65 | 18 | | [– — -]: IACOB: cross pattee with four pellets | Blazon type shield bordered by 9 small anullets, positioned in symetrical fashion around the shield. | 1178–1179 | Vadum Iacob | Kool 1999 | | 73061 |
| 29 | E | 406 | 1012 | 3.66 | 18 | | ✠VΛD[I:] IACOB: | Same | Same | Same | Same | | 73077 |
| 30 | E | 466 | 4530 | 2.68 | 19 | | ✠VΛDI: IACOB: | Same | Same | Same | Same | | 107777 |
| 31 | E1 | 520 | 5139 | 2 | 17 | | ✠VΛDI: IACOB: | Same | Same | Same | Same | | 74254 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Regency of Raymond III of Tripoli** | | | | | | | | | | | | | |
| 32 | E | 104 | 1138 | 0.50 | 15 | | [T·V· R· R· I· S ·]<br>Tower of David | ✢· D· A· V· I· T·<br>Eight-rayed star | 1174–1177 | | Kool 2006 | | 107810 |
| **FRANCE**<br>**Bishops of Le Puy** | | | | | | | | | | | | | |
| 33 | E | 105 | 1078 | 0.86 | 20 | | Chrismon | Cross with knopped arms | 12th c. | Le Puy, Languedoc | PA 1: 341, No. 2231–2, 2228; Metcalf 1995: No.596 | | 107811 |
| **FATIMIDS**<br>**Abu Al-Qasim Ahmad Al-Musta'li billah**<br>**AH 487–496 (=1094–1101 CE),** *Dirham* | | | | | | | | | | | | | |
| 34 | | Stray-find | | 1.11 | 14 | | Within circle:<br>الامام<br>الحمد<br>Marginal legend:<br>ابو القاسم المستحلى باالله امير المومنين | Within circle:<br>الله<br>الصمد<br>Marginal legend:<br>لا اله الا الله مصمد رسول اللة | | | Balog 1950–51: 7, No.1 | | 74449 |
| **ZANDJIDS**<br>**— Atabegs of Halab**<br>**Al-'Âdil Nûr Al-Dîn Mahmûd**<br>**AH 541–569 (=1146–1174 CE),** *Fals* | | | | | | | | | | | | | |
| 35 | K | 733 | 7085 | 5.85 | 28 | | Center:<br>المك العادل<br>Anchor ornament above and below between stars | Center:<br>محمود ابن زنكى<br>Anchor ornament above and below between stars | | Damascus | SICA 6: No.842 | | 74277 |
| 36 | E | 873 | 8578 | 5.89 | 24 | | Same | Same | | Same | Same | | 73108 |
| 37 | B | 352 | | 4.95 | 23 | | As above, but floweret arabesque ornament between stars | As above, but floweret arabesque ornament between stars | | Same | Hennequin 1985: 297, No.569 | | 73066 |
| 38 | E | 906 | 9012 | 5.53 | 25 | | Same | Same | | Same | Same | | 107795 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AYYUBIDS<br>Al-Nasir Salāh Al-Dîn Yûsuf Ibn Ayyûb<br>as nominal vassal of Al-Sālih Ismā'îl (Zandjids)<br>AH 570–571 (=1174 CE),** *fals* | | | | | | | | | | | | | |
| 39 | | Stray-find | | 5.48 | 23 | | Center:<br>الماك الناصر<br>بوسف<br>Marginal legend missing | Center:<br>الماك الصاح<br>اسمعيل<br>Marginal legend: illegible | | Same | Balog 1980: 61, No.11. | | 31943 |
| **Sultanate of Egypt<br>Al-Nasir Salāh Al-Dîn Yûsuf Ibn Ayyûb<br>AH 583–589 (=1187–1193 CE),** *fals* | | | | | | | | | | | | | |
| 40 | | Stray-find | | 4.98 | 24 | | Center:<br>الماك الناصر<br>Marginal legend illegible | Center:<br>يوسف<br>بن ايوب<br>Marginal legend: illegible | | Same | Balog 1980: 93, No.143. | | 31942 |
| **Al-'Azîz 'Imad Al-Dîn Abū Al Fath 'Uthmān<br>AH 592–595 (=1195–1198 CE),** *dirham* | | | | | | | | | | | | | |
| 41 | E2 | 611 | 6067 | 2.56 | 21 | | Center:<br>الملك العزيز<br>عمد الدنيا و<br>الدين عثمان | Center:<br>الامام الناصر<br>لدين الله ا<br>مير المومنين | | Same | Balog 1980: 110, No.211. | worn | 108036 |
| *fals* | | | | | | | | | | | | | |
| 42 | B | 372 | 3576 | 4.82 | 24 | | Center:<br>عثمان<br>الملك العزيز | Center:<br>سف<br>بن الملك النا صر<br>يو | | Same | Balog 1980: 113, No.223. | | 73074 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Al-ʻĀdil Sayf Al-Dîn Abû Bakr Muhammad I AH 596–615 (=1199–1218 CE),** *Fals* | | | | | | | | | | | | | |
| 43 | B | 358 | 3549 | 3.21 | 22 | | Center:<br>الدين<br>المالك العادل<br>سيف<br>Arabesque knot in the four corners. | Center:<br>ابو بكر بن ايوب<br>Six-pointed stars in the four corners.<br>Arabesque knot above and beneath legend. | | Same | Balog 1980: 110, No.211. | | 73071 |
| 44 | E | 871 | 8559 | 4.45 | 24 | | Same | Same | | Same | Same | | 73104 |
| 45 | K | Surface find | | 3.51 | 23 | | Same | Same | | Same | Same | | 74251 |
| 46 | C | 571 | 5624 | 4.66 | 24 | | Same | Same | | Same | Same | | 73085 |
| 47 | E | 467 | 4534 | 4.26 | 22 | | Same | Same | | Same | Same | | 107784 |
| 48 | E | 867 | 8545 | 3.05 | 20 | | Center:<br>المالك<br>العادل<br>ابو بكر<br>بن ايوب | Center:<br>احمد<br>الامام<br>الناصر | 1211 | Hamah | Balog 1980:137, No.327 | | 73100 |
| 49 | E | 867 | 8545 | 3.05 | 20 | | Border segment:<br>ضرب بال ها سنة احدى عش ة وستماة<br>Double concave sided pointillate hexagon<br>Center:<br>المالك<br>العادل | Illegible | 1195 | Al-Ruha | Balog 1980:143, No.353. | | 74247 |
| **Al-Kāmil Nāsir Al-Dîn Abû Al-Maʻālî Muhammad I AH 625–635 (=1227–1237 CE) with the Caliph Al-Mustansir AH 623–640 (=1226–1242 CE),** *Fals* | | | | | | | | | | | | | |
| 50 | | Surface find | | 3.48 | 19 | | Square in circle: Illegible | Square in circle, in center:<br>محمد بن ابي بكر بن ايوب | | | Balog 1980: 169, No.465. | | 73111 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ayyûbids<br>12th c.,** *Fals* | | | | | | | | | | | | | |
| 51 | G | 200 | 2010 | 0.93 | 16 | | Illegible | Illegible | | | | | 73052 |
| 52 | G | 200 | 2018 | 0.65 | 15 | | Illegible | Illegible | | | | | 73053 |
| 53 | | Surface find | | 2.66 | 24 | | Illegible | Illegible | | | | | 74279 |
| **Ayyûbids<br>13th c.,** *dirham* | | | | | | | | | | | | | |
| 54 | A | 252 | 2521 | 3.14 | 20 | | Illegible | Illegible | | | | | 107785 |
| **Principality of Halab Al-Zāhir Ghiyāth Al-Dîn Ghāzî<br>AH 582–613(=1186–1216 CE) with the Caliph Al-Nāsir AH 575–622 (1180–1225 CE),** *Fals* | | | | | | | | | | | | | |
| 55 | | 866 | - | 3.13 | 23 | | Linear and dotted eight-pointed star type. Illegible. | Linear and dotted eight-pointed star type. Illegible. | 1206–1215 | Aleppo | Balog 1980: 215, No.675. | | 73097 |
| **Al-'Azîz Ghiyāth Al-Dîn Abû Al-Muzaffar Muhammad<br>AH 613–634(=1216–1236 CE) with the Caliph Al-Nâsir AH 575–622 (1180–1225 CE),** *Fals* | | | | | | | | | | | | | |
| 56 | | 569 | 5539 | 2.92 | 21 | | Linear and dotted octalobe,<br>center:<br>الملك العزيز<br>Marginal legend: illegible | Linear and dotted octalobe,<br>center:<br>الامام<br>الناصر<br>Marginal legend: illegible | 1216–1236 | Same | Balog 1980: 222, Nos.708–13. | | 73083 |
| 57 | | Surface find | | 3.17 | 23 | | Same | Same | Same | | Same | | 73115 |
| **Al-Nâsir Salâh Al-Dîn Yûsuf II<br>AH 634–65 8(=1236–1259 CE) with the Caliph Al-Musta'sim<br>AH 640–656 (1242–1258 CE),** *Fals* | | | | | | | | | | | | | |
| 58 | | 565 | 5532 | 1.19 | 16 | | Square in circle:<br>الملك الناصر<br>Marginal legend: illegible | Illegible<br>Marginal legend: illegible | | Aleppo | Balog 1980: 223, No.758. | | 73082 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rûm Saldjûqs at Erzurum Rukn Al- Dîn Jahan Shah bin Tughril AH 622–627 (=1225–1230 CE),** *Fals* | | | | | | | | | | | | | |
| 59 | Stray-find | | | 3.72 | 23 | | Sultan seated on low chair within ornamented square | In the field: ركن الدنيا والدين ابو الفتح جمانشاة بن طغرل | | | Hennequin 1985: 683, No.1620 | | 74446 |
| **MAMLŪKS Al-Mansûr Sayf Al-Dîn Qalā'ûn AH 678–689 (=1279–1290 CE),** *Fals* | | | | | | | | | | | | | |
| 60 | G | 225 | 2236 | 1.37 | 18 | | Center: الماك سيف المنصور الدين | Hexagram | | | unpublished | | 73064 |
| **Al-Ashraf Salâh Al-Din Khalil (1290–1293),** *Fals* | | | | | | | | | | | | | |
| 61 | G | 200 | 2058 | 1.16 | 17 | | Illegible | Illegible | | Hamah | Balog 1964:124, No.154a. (Add.) | | 73054 |
| **Al-Nâsir Nâsir Al-Dîn Muhammad, 3rd reign AH 709–741 (=1310–1341 CE),** *silver-plated Dirham* | | | | | | | | | | | | | |
| 62 | | Surface find | | 1.34 | 15 | | Illegible | Illegible | | | | | 107809 |
| | | | | | | | Fals | | | | | | |
| 63 | A | 1505 | 15016 | 2.74 | 22 | | Center: [...] باصر الدنيا و الدين محمد [...] [...] | Center: [...] لا اله الا الله [ محمد رسول الله ] [...] [...] | | Cairo | Balog 1964: 150, No.221. | | 74282 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Al–Mansûr Sayf Al–Dîn Abû Bakr AH741–42(=1341),** *Fals* | | | | | | | | | | | | | |
| 64 | | 555 | | 2.94 | 19 | | Hexagram, in center:<br>[اثين]<br>سنة<br>و اربعين | Hexagram, in center:<br>ضر<br>ب<br>مشق<br>بد | | Damascus | Balog 1964: 165, No.268. | | 73081 |
| 65 | | Surface find | | 3.33 | 19 | | Same | Same | | Same | Same | | 107790 |
| **Al–Sālih 'Imâd Al–Dîn Ismâ'îl AH 743–46 (=1342–45),** *Fals* | | | | | | | | | | | | | |
| 66 | | 552 | 5558 | 2.68 | 19 | | Field divided by two horizontal rows of dots:<br>اسمعيل<br>الملك الصا ح ا<br>بن محمد[ ] | Illegible | | Same | Balog 1964: 173, No.287. | | 73080 |
| 67 | | Surface find | 1030 | 2.86 | 21 | 12 | Same | Same | | Same | Same | | 107798 |
| **Al–Nāsir Nāsir Hasan AH 748–752 (=1347–51), 1st reign,** *Fals* | | | | | | | | | | | | | |
| | | 552 | 5558 | 2.68 | 19 | | field divided by two horizontal lines:<br>بن محمد<br>الملك الناصر حسن<br>[ ضرب دمشق سنة] | Two interwoven tetralobes, in center:<br>تسع و<br>اربعين | 1348 | Same | Balog 1964: 187, No.327. | | |
| **Al–Ashraf Nāsir Al–Dîn Shā'bān II, AH 764–78 (=1363–77),** *Fals* | | | | | | | | | | | | | |
| 68 | K | 704 | 7028 | 2.61 | 19 | | Field divided by two horizontal lines, arabesque ornament in upper and lower segment:<br>الملك الاشرف | Field divided by two horizontal lines:<br>[...]<br>[...]<br>سنة سبعين<br>[...] | 1368 | Same | Balog 1964:220, No.454. | | 74264 |
| 69 | E1 | 550 | 5102 | 1.68 | 15 | | Same | Same | Same | Same | Same | | 74259 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hajji II Salah al-Din, 2nd reign, AH 791–92 (=1389–90),** *Fals* | | | | | | | | | | | | | |
| 70 | E | 80 | 8019 | 2.69 | 18 | | Fesse<br>Illegible | Hexagram<br>Illegible | 1389 | Same | Balog 1964:246, No.532. | | 107781 |
| **Al–Zāhir Sayf Al–Dîn Barqûq, 2nd reign AH 792–801 (=1390–99),** *Fals* | | | | | | | | | | | | | |
| 71 | E1 | W.80 | 5125 | 3.62 | 17 | | Center:<br>الساطان الملك<br>[...] | Center:<br>[...]<br>سكند<br>[...] | 1368 | Alexandria | Balog 1964:265, No.587. | | 74260 |
| 72 | K | 700 | 7003 | 2.83 | 18 | | Double linear dodekalobe:<br>ابو سعيد<br>الملك الظاهر<br>برقوق | Double linear dodekalobe:<br>سنة<br>بدمشق<br>و تسعن و<br>سبعماية | 1394 | Damascus | Balog 1964:265, No.588. | | 74263 |
| 73 | K | Surface find | | 2.75 | 19 | | Same | Same | Same | Same | Same | | 74280 |
| 74 | B | 352 | - | 4.43 | 17 | | Same | Same | Same | Same | Same | | 73067 |
| 75 | B | 372 | 3576 | 3.11 | 22 | | Double linear dodekalobe:<br>ابو سعيد<br>الملك الظاهر<br>برقوق | Double linear dodekalobe:<br>ضرب<br>دمشق<br>سبع و تسعن و<br>سنة سبعماية | | Same | Balog 1964:265, No.589. | | 73075 |
| 76 | | 306 | 3043 | 4.78 | 23 | | Linear dodekalobe | Fleur-de-lis | c.1400 | Same | Balog 1964:266, No.591. | | 107778 |
| 77 | G | 211 | 2014 | 1.82 | 17 | | Field divided in three segments | Waterwheel with eight sickle- shaped spokes curved clockwise | | Aleppo | Balog 1964:271, No.600a. | | 73057 |

| | AREA | LOCUS | BASKET | WEIGHT (GR.) | DIAM. (MM.) | AXIS | OBVERSE | | DATE (CE) | MINT | REFERENCE | NOTES | IAA NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Al–Ashraf Ināl al–Alā'î 'Al-Zāhirî AH 857–865 (=1453–61),** *Fals* | | | | | | | | | | | | | |
| 78 | Q | Quarry | | 1.87 | 18 | | Field divided by two horizontal rows of dots: اسمعيل / الملك الصا ح ا / [بن محمد ] | Illegible | | Same | Balog 1964: 173, No.287. | | 107794 |
| **Mamluk, 14th,** *dirham* | | | | | | | | | | | | | |
| 79 | A | | 1051 | 2.74 | 22 | | Illegible | Illegible | | | | | 107797 |
| *fals* | | | | | | | | | | | | | |
| 80 | K | 716 | 7044 | 3.81 | 22 | | Illegible | Illegible | | | | | 74267 |
| 81 | K | 709 | 7039 | 2.15 | 12 | | Illegible | Illegible | | | | | 74265 |
| 82 | | | 3592 | 3.92 | 21 | | Illegible | Illegible | | | | | 73114 |
| 83 | | 867 | 8545 | 2.28 | 17 | | Illegible | Illegible | | | | | 73099 |
| 84 | B | 356 | 3547 | 1.81 | 18 | | Illegible | Illegible | | | | | 73069 |
| 85 | B | 306 | 3013 | 2.43 | 20 | | Illegible | Illegible | | | | | 107782 |
| **OTTOMANS Ahmad III, AH 1115–43 (=1703–30),** *Para* | | | | | | | | | | | | | |
| 86 | G | 212 | 2130 | 0.56 | 15 | | Center: 1115 | Tughra | 1703 | Qustantini-yeh | Pere 1968: 194, No.523 | | 73058 |
| 87 | G | 212 | 2130 | 0.55 | 16 | | Center: ضرب فمصر 1115 | Tughra | 1703 | Misr | Pere 1968: 194, No.528. | | 73059 |
| **Mahmûd I, AH 1143–68 (=1730–54),** *Para* | | | | | | | | | | | | | |
| 88 | G | 212 | 2130 | 0.38 | 15 | | Center: ضرب فقنسطنطنية 1143 | Tughra | 1730 | Qustantini-yeh | Pere 1968: 203, No.580 | | 73060 |
| **Mahmud II, 1223–1255 AH/1808–1839 CE,** *Yirmilik* | | | | | | | | | | | | | |
| 89 | B | 356 | 3541 | 0.1 | 13 | | Center: ضرب فمصر | Tughra | | Misr | Pere 1968: 252, No.845. | | 73068 |


1


2


3


4


5


6


7


8


9


10


11


12


13


14


15


16


17


18


19


20


21


22


23

24

25

28

29

30

31

32

33

35

36

37

42

44

56

64

# CRUSADER HOARD (L115, B.1034)

| LATIN KINGDOM OF JERUSALEM<br>**Amaury I, 1163–1174 CE,** *Denier series* | |
|---|---|
| ✝AMALRICVS REX<br>Cross pattée; annulets/stops in two and three (or one and four) | ✝ DE IERVSALEM<br>Church of the Ressurection |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| *chevron type* Ѧ | | | | | | | | | |
| 1-18 | 0.87 – 1.06 | 18 | | Ѧ - Ѧ - Ѧ | REX ∘ | ✝ | Kool 2013: 231, No.1.1.1.1 | | 112202, 112229, 112253, 112259, 112261, 112262, 112306, 112307, 112318, 112326, 178511, 178512, 178515, 178520, 178523, 178524, 178528, 178533 |
| 19 -20 | 0.95 – 1.04 | 18 | | Same | Same | ✝ | Kool 2013: 231, No.1.1.1.2 | | 112203, 112311 |
| 21-25 | 0.95 – 1.05 | | | Same | same | ✝ | Kool 2013: 231, No.1.1.1.3 | | 112212-3, 112226, 112254, 112299 |
| 26-27 | 0.98 | | | Same | Same | ✝ | Kool 2013: 231, No.1.1.1.4 | | 112294, 112327 |
| 28-37 | 0.96 – 1.09 | | | Same | REX ⁝ | ✝ | Kool 2013: 231, No.1.1.2.1 | | 112223, 112241, 112281, 112286, 112305, 112319, 112321, 112332, 178517, 178518 |
| 38 | 0.97 | 17 | | Same | Same | ✝ | Kool 2013: 231, No.1.1.2.2 | | 178519 |
| 39-42 | 0.99 – 1.08 | | | Same | REX ⁞ | ✝ | Kool 2013: 231, No.1.3.1.1 | | 112245, 112265, 112276, 112328 |
| 43-46 | 0.94 – 1.04 | | | Same | REX · | ✝ | Kool 2013: 231, No.1.1.4.1 | | 112258, 112284, 178510, 178527 |
| 47 | 1.17 | | | Same | Same | ✝ | Kool 2013: 231, No.1.1.4.2 | | 112224 |
| 48-55 | 0.94 – 1.09 | | | Same | Same | ✝ | Kool 2013: 231, No.1.1.4.5 | | 112230, 112240, 112251, 112308, 112316, 178514, 178521, 178529 |
| 56 | | | | Same | REX ⁝ | ✝ | Kool 2013: 231, No.1.1.5.1 | | 112322 |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| 57 | 0.98 | | | Same | REX ⁝ | | Kool 2013: 231, No.1.1.6.1 | | 112277 |
| 58-61 | 1.01 | | | Same | REX | | Kool 2013: 231, No.1.1.8.1 | | 112238, 112329, 178535, 178536 |
| 62 | 1.01 | | | Same | Same | | Kool 2013: 231, No.1.1.8.2 | | 112208 |
| 63-64 | 0.91 | | | Same | Same | | Kool 2013: 231, No.1.1.8.3 | | 178534, 112333 |
| 65-66 | 0.9 - 1 | | | Same | Same Illegible mintmark | | Cf. Kool 2013: 231, No.1.1.8.3 | | 112216, 112320 |
| 67 | 1.02 | | | A - A - A third is dotted chevron | REX · | | Cf. Kool 2013: 231, No.1.1.4.5 | | 112298 |
| 68 | 0.95 | | | A - A - A double-barred | REX ◦ | | Kool 2013: 231, No.1.3.1.1 | | 112201 |
| 69 | 0.97 | | | A - ? - A | REX ◦ | | | | 112295 |
| 70 | 1 | | | A - A - ? | REX ◦ | | | | 112273 |
| 71 | 0.97 | | | A - ? - A | REX · | | | | 112233 |
| 72 | 0.97 | | | A - ? - A First chevron barred with single bar | REX ⁝ | | | | 112220 |
| *dotted chevron type* A | | | | | | | | | |
| 73-75 | 1.02 – 1.06 | | | A - A - A Three dotted chevron | REX ◦ | | Kool 2013: 2.1.1.1 | | 112228, 112257, 112267 |
| 76 | 1.06 | | | Same | Same | | Kool 2013: 2.1.1.2 | | 112231 |
| 77-80 | 0.94 – 1.04 | | | Same | REX · | | Kool 2013: 2.1.3.1 | | 112211, 112255, 112272, 112287 |
| 81-82 | 0.97 | | | Same | Same | | Kool 2013: 2.1.3.2 | | 112260, 112269 |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| 83 | 0.91 | | | Same | Same |  | Kool 2013: 2.1.3.3 | | 112297 |
| 84-86 | 0.94 – 1.1 | | | Same | R∈X |  | Kool 2013: 2.1.5.1 | | 112219, 112244, 112279 |
| 87 | 1.03 | | | Same | Same |  | Kool 2013: 2.1.5.2 | | 112323 |
| 88 | 0.99 | | | Same | Same Illegible mintmark |  | Cf. Kool 2013: 2.1.5.2 | | 112293 |
| 89 | 0.93 | | | A - A - A First two dotted chevron | R∈X |  | Kool 2013: 2.2.3.1 | | 112217 |
| 90 | 0.98 | | | A - A - A First two dotted chevron; chevron with dot above | R∈X ∘ |  | Kool 2013: 2.3.1.1 | | 112304 |
| 91 | 0.99 | | | A - ? - A dotted chevron | R∈X |  | Cf. Kool 2013: 2.1.3.1; 2.1.3.3 | | 112263 |
| 92 | 0.97 | | | Same | illegible |  | Cf. Kool 2013: 2.1.1.1 | | 112204 |
| *double barred type* A | | | | | | | | | |
| 93-107 | 0.89 – 1.02 | | | · - · - · Three double barred | R∈X ∘ |  | Kool 2013: 3.1.1.1 | | 112225, 112235, 112237, 112243, 112246, 112274, 112285, 112296, 112312-14, 178525-6, 178531, 178532 |
| 108-109 | 0.92 - 1 | | | Same | Same |  | Kool 2013: 3.1.1.3 | | 112256, 112317 |
| 110 | 0.92 | | | Same | R∈∘X |  | Kool 2013: 3.1.2.1 | | 112209 |
| 111-116 | 0.92 - 1 | | | Same | R∈X · |  | Kool 2013: 3.1.3.1 | | 112227, 112242, 112278, 112301-3 |
| 117 | 0.95 | | | Same | Same |  | Kool 2013: 3.1.3.2 | | 112215 |
| 118-128 | 0.94 – 1.06 | | | Same | R∈X |  | Kool 2013: 3.1.4.1 | | 112200, 112206, 112210, 112221, 112247, 112275, 112282, 112288, 112325, 178516, 178522 |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| 129-130 | 0.97 – 1.02 | | | Same | Same |  | Kool 2013: 3.1.4.2 | | 112300, 112310 |
| 131 | 0.96 | | | Same | Illegible |  | Cf. Kool 2013: 3.1.1.1 | | 112289 |
| 132-135 | 0.9 -0.96 | | | · - · - A First two double barred; third triple barred | REX · |  | Kool 2013: 3.2.1.1 | | 112248, 112252, 112264, 178530 |
| 136 | 1.01 | | | Same | Same |  | Kool 2013: 3.2.1.2 | | 112250 |
| 137-138 | 0.93-0.97 | | | Same | REX · |  | Kool 2013: 3.2.2.1 | | 112270, 112283 |
| 139-140 | 0.96-1.02 | | | Same | REX |  | Kool 2013: 3.2.3.1 | | 112309, 178513 |
| 141 | 0.96 | | | · - · - Λ First two double barred; third no bar | REX |  | Kool 2013: 3.4.1.1 | | 112239 |
| 142-143 | 1.05 | | | Same | REX · |  | Kool 2013: 3.5.1.1 | | 112222, 112271 |
| 144 | 1.01 | | | Same | REX · (small stop) |  | Kool 2013: 3.5.2.1 | | 112280 |
| 145 | 1 | | | · - · - A Third chevron dotted | REX · |  | Kool 2013: 3.6.1.1 | | 112207 |
| 146 | 0.84 | | | · - · - ? | REX · |  | Cf. Kool 2013: 3.2.1.1 | | 112234 |
| 147 | 1 | | | · - A - · First and third double barred; second triple barred | REX · |  | Kool 2013: 3.7.1.1 | | 112232 |
| 148 | 0.98 | | | Same | Same |  | Kool 2013: 3.7.1.2 | | 112291 |
| 149 | 0.94 | | | Same | REX |  | Kool 2013: 3.7.2.1 | | 112236 |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| 150 | 0.94 | | | · - Ⱥ - Ⱥ<br>First double barred; second and third chevron barred | ꞎEX ◦ |  | Kool 2013: 3.9.1.1 | | 112324 |
| 151-152 | 0.95 | | | ? -? - · | ꞎEX |  | Cf. Kool 2013: 3.1.4.1 | | 112330, 112331 |
| *triple barred type* Ⱥ | | | | | | | | | |
| 153 | 0.92 | | | Ⱥ - Ⱥ - Ⱥ | ꞎEX |  | Kool 2013: 4.1.3.1 | | 112290 |
| 154 | 0.93 | | | Ⱥ - Ⱥ - Ⱥ | Illegible |  | Cf. Kool 2013: 4.1.3.1 | | 112315 |
| *unbarred type* Ʌ | | | | | | | | | |
| 155 | 1.11 | | | Ʌ - Ⱥ - Ⱥ | ꞎEX ◦ |  | Kool 2013: 6.2.1.1 | | 112266 |
| 156 | 0.98 | | | Ʌ - Ⱥ - Ⱥ | ꞎEX |  | Kool 2013: 6.5.1.1 | | 112292 |
| 157 | 0.94 | | | Ʌ - Ⱥ - Ⱥ<br>second and third chevron dotted | ꞎEX ◦ |  | Kool 2013: 6.6.1.1 | | 112249 |
| 158 | 1.09 | | | Same | ꞎEX ⁝ |  | Kool 2013: 6.6.2.1 | | 112218 |
| 159 | 0.9 | | | Ʌ - Ʌ - Ⱥ | ꞎEX ⁝ |  | Kool 2013: 6.7.1.1 | | 112268 |
| | | | | Unidentifiable type Ⱥ | | | | | |
| 160-163 | | | | | ꞎEX |  | Kool 2013: 4.1.3.1 | | 112205, 112334-6 |

| No. | Weight (gr.) | Diam. (mm.) | Axis | Type | Rex/mintmark | Annulets/ stops | Type Reference | Notes | IAA No. |
|---|---|---|---|---|---|---|---|---|---|
| **PRINCIPALITY OF ANTIOCH<br>Bohemond III, 1163 – 1201** | | | | | | | | | |
| 164 | 0.91 | 17 | 5 | | ✠BOAMVNDVS<br>Left facing bust of ruler in chain armour wearing conical helmet decorated with cross; flanked left and right, by crescent and star | ✠AMTIOCNIA<br>Cross patee, crescent in first quarter | | Cf. Metcalf 1995: 377, Class B/C (?), main series 1163 – 1188.<br>Dotted A , M, ë | 112214 |

1 2 3
4 5 6
7 8 9
10 11 12
13 14 15
16 17 18
19 20 21
22 23 24


25


26


27


28


29


30


31


32


33


34


35


36


37


38


39


40


41


42


43


44


45


46


47


48


49


50


51


52


53


54


55


56


57


58


59


60


61


62


63


64


65


66


67


68


69


70


71


72


73


74


75


76


77


78


79


80


81


82


83


84


85


86


87


88


89


90


91


92


93


94


95


96


97


98


99


100


101


102


103


104


105


106


107


108


109


110


111


112


113


114


115


116


117


118


119


120


121


122


123


124


125


126


127


128


129


130


131


132


133


134


135


136


137


138


139


140


141


142


143


144


145


146


147


148


149


150


151


152


153


154


155


156


157


158


159


161-163


164

CHAPTER 18

# CRUSADER HISTORY AND PLATE TECTONICS: VADUM IACOB AND THE EARTHQUAKES OF MAY 1202 AND NOVEMBER 1759

*Ronnie Ellenblum, Shmuel Marco and Amotz Agnon*[1]

Sometime during the month of June 1202, Philip du Plessis, the master of the Knights Templars, wrote a letter to the abbot of Citeaux, describing the earthquake which shook the northern regions of Palestine and Southern Syria a month earlier: "At sunrise," he wrote, "a terrible voice was heard from heaven, horrible bellowing of the ground and an earthquake, similar to which did not occur since the beginning of the world… "[2] A very similar letter was sent at about the same time by Geoffrey of Donjon, the master of the Hospital, to the king of Navarra. Geoffrey was also horrified by the magnitude and damage of this event and further elaborated on its results. Ralph of Coggeshale, who wrote several years later, joins his predecessors in referring to the earthquake of May 1202, as the biggest tremor since the crucifixion of Jesus Christ. The city of Tyre, he says, was totally destroyed and one third of the city of Acre was ruined.[3]

Such exaggerated descriptions are quite abundant, as many of the medieval chroniclers presented the earthquakes which occurred during their own lifetimes as singular events and the worst ever. The strong earthquake of 1170, for example, was described by William of Tyre as being "far more violent than any other earthquake within the memory of men now living."[4] Therefore, the assertion made by Philip du Plessis, that the catastrophic event of Monday, 20 May 1202 was the worst ever, should be taken with caution. However, although it was probably not as bad as the chroniclers would like us to believe, it was strong enough

1 This paper was drafted more than two decades ago. The late Professor Ronnie Ellenblum, a historical geographer who had a background in basic geology and practical experience in archaeology, envisioned the Vadum Iacob project as a contribution to geology, archaeology and history. We revived the study a few months before what turned out to be his early passing. Hence, we could not locate all of Ronnie's sources and did not verify all statements.

2 "fuit, quod vicesima die maii summo diluculo audita est vox terribilis de celo, mugitus horribilis de terra et terremotus, quales non fuerunt ab initio mundi, facti sunt." For more details about the earthquake and its consequences, see Mayer, H. E. Two Unpublished Letters on the Syrian Earthquake of 1202. In S. A. Hanna (ed.) *Medieval and Middle Eastern Studies in Honor of Aziz Suryal Atiya* (Leiden, 1972), 295–310.

3 Ralph of Coggeshale. *Chronicon anglicanum*. J. Stevenson (ed.) Rolls Series (London, 1875), 141.

4 Willelmi Tyrensis Archiepiscopi Chronicon. R.B.C. Huygens (ed.) *Corpus Christianorum Continuatio Mediaevalis* 63–63a (Turnhout, 1986), 18, 20, 934–936.

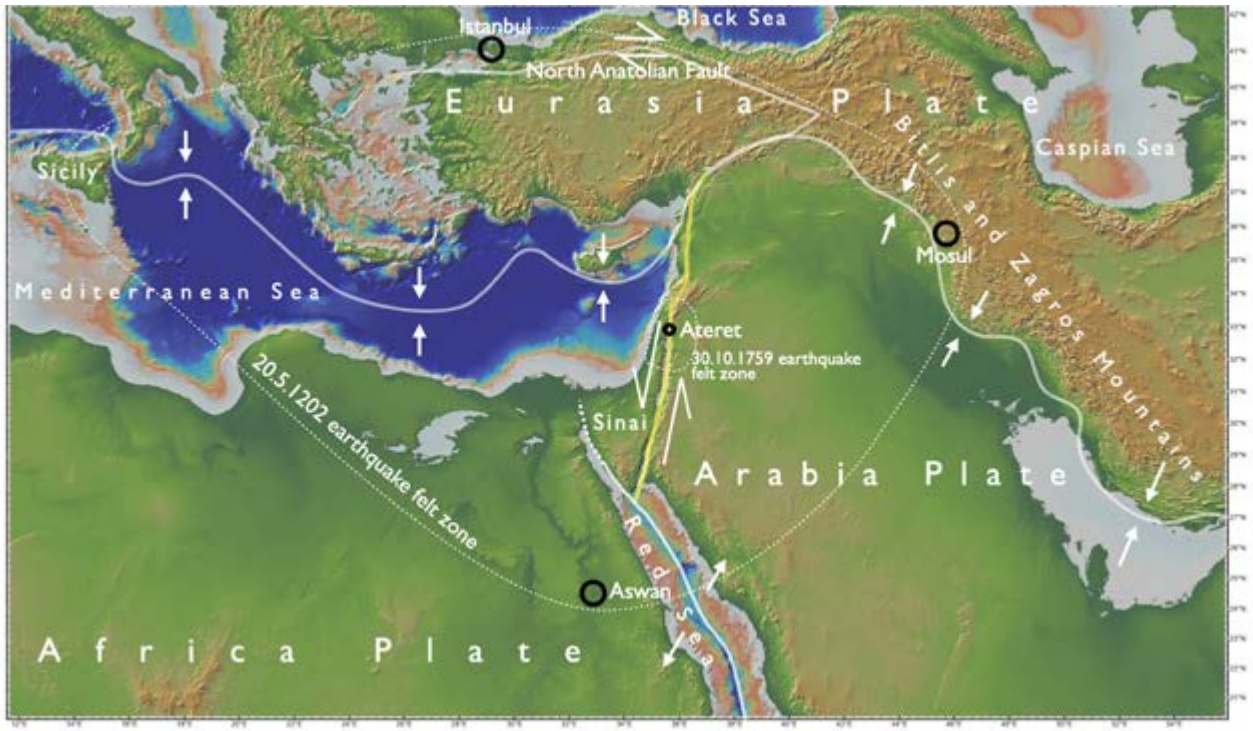



**Figure 18.1.** A regional map showing the tectonic plates and their boundaries and the extent of fault zones for selected historic earthquakes. White curve: the southern boundary of the Eurasian Plate; yellow: Dead Sea fault; blue: North Anatolian Fault (900 km ruptured sequentially 1939–1999). Stippled white curves — felt zones of 20 May 1202 and 30 October 1759, respectively.

to be mentioned by sources such as Ibn al Athir, Abu al-Fida,[5] Robert of Auxerre [†1212],[6] Ralph of Coggeshale [†1228],[7] William of Nangis [† ca. 1300] and many others.[8] It appears that the earthquake of May 1202 was felt everywhere between Sicily and Mesopotamia, the Cilician coast and Southern Egypt (Fig. 18.1).

Most of the testimonies to this earthquake, like most of the testimonies to any other earthquake, refer only to the part of the damage that interested the chronicler. The Latin chroniclers of the 1202 earthquake, for example, emphasized the damage wrought on the Frankish cities of Acre, Tyre, Tripoli and Arqah, and ignored the damage to the Muslim cities of Nablus, Damascus, Hims, and Hama. The Muslim chroniclers, on the other hand, presented a diametrically reversed picture, ignoring the damage to the Latin centers and accentuating the damage to the Muslim ones. The selective attitude of the texts is apparent also when only Latin

5 Ibn al-Athīr, *The Chronicle of Ibn al- Athīr for the Crusading Period from Al-Kāmil fi'l-Ta'rīkh*. Tran. D. S. Richards, (Aldershot, Hampshire, U.K., 2007), vol. 3:62; Bar Hebraeus (Abu l-Faraj), *Chronography*. Trans. E.A.W. Budge (Oxford, 1932), vol. I. 486ff; Abu l'-Fida', Al-mukhtasar ta'rikh al-bashar. *Recueil des Historiens des Croisades. Historiens Orientaux* vol. 1: 79; Hethum, Count of Gor'igos. 'Table chronologique,' *Recueil des Historiens des Croisades. Documents Armeniens*, vol. 1: 480.

6 Robert of Auxerre. *Chronicon, Monumenta Germaniae Historica. Scriptores*, vol. 26: 261.

7 Ralph of Coggeshale, *Chronicon anglicanum*, 141.

8 William of Nangis, *Chronicon. Bouquet, Recueil des Historiens des Gaules et de la France*)Paris, 1840), vol. 20: 750.

descriptions are read. The master of the Hospital, for example, refers only to the damage to the Hospitaller castles of Crac des Chevaliers and Margat and ignores the similar damage to the Templar castle of Chastel-Blanc (Safita). The master of the Temple on the other hand, ignores the damage to Crac and Margat and mentions only the damage to Chastel Blanc.

Only by reading as many accounts as possible, and carefully separating the unreliable testimonies from the more reliable ones, is it possible to draw lines of equal damage (*isoseismals*). In the case of the 1202 earthquake, for example, it is clear that the source should be sought along the rift valley, somewhere between the cities of Acre, Damascus, Banyas, Safad (Zfat), Nablus and Tyre. And indeed, Nicholas Ambraseys and Charles Melville, relying on the exhaustive study of Hans Eberhard Mayer, drew isoseismals and located the assumed epicenter in the region of the upper Jordan Valley, estimating the magnitude of this earthquake to be of 7.2–7.3.[9]

Our archaeological study of the unfinished Frankish castle of Vadum Iacob (now called Metzad Ateret) has revealed that the Frankish castle was torn apart by seismogenic movements on the active segment of the Dead Sea Fault (DSF),[10] which separates the two tectonic plates of Sinai on the west and Arabia on the east (Fig. 18.1).[11] The DSF transfers the opening of the Red Sea to the collision zone in the Bitlis-Zagros Mountains of Turkey and Iran, where the Arabian and Eurasian plates collide. The active strand of the DSF crosses the castle in its middle, shifting the eastern half 2.1 m to the north relative to the western half (Figs. 18.2–5).[12]

Paleo-seismological trenching, combined with archaeological and historical studies, revealed that the slip measured on the Crusader walls of Vadum Iacob is an accumulation of two or more consecutive earthquakes.[13] Most of the offset of the walls, 1.6 m, occurred on 20 May 1202 with a large earthquake emanating from a 200 km long rupture. A mosque floor at the northern side of the castle dates from Ayyubid times according to pottery; this is in accordance with historical sources stating that, after the 1179 conquest, Saladin reinstated the holy place.[14] An additional 0.5 m slip along the previous rupture, bisecting a Mamluk (mid-13th to early 16th century) mosque, is associated with one or two subsequent earthquakes during the Ottoman Period: 30 October 1759, and 1 January 1837. It is noteworthy, however, that the Mamluk mosque had already been in ruins and abandoned for a considerable length of time before being offset during an Ottoman-period earthquake.[15] The relative

9 Ambraseys, N.N. and Melville, C. P. An Analysis of the Eastern Mediterranean Earthquake of 20 May 1202. In W. K.H. Lee, H. Meyers and K. Shimazaki (eds.) *Historical Seismograms and Earthquakes of the World* (San Diego, 1988), 181–200.

10 Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–98.

11 The DST was the first transform fault to ever be defined as such. See Quennell, A. M. Tectonics of the Dead Sea Rift. *Congreso Geologico Internacional, 20th session, Asociacion de Servicios Geologicos Africanos* (Mexico City, 1956): 385–405.

12 Marco, S, Agnon, A., Ellenblum, R., Eidelman, A., Basson, U. and Boas, A. 817-Year-Old Walls Offset Sinistrally 2.1 m by the Dead Sea Transform, Israel. *Journal of Geodynamics* 24/1–4 (1997): 11–20; Ellenblum, R., Marco, S., Agnon, A., Rockwell, T. and Boas, A. Crusader Castle Torn Apart by Warthquake at Dawn, 20 May 1202. *Geology* 26/4 (1998): 303–306.

13 Ellenblum, R. et al., Crusader Castle: 303–306.

14 Ellenblum, Frontier Activities; see also Chapters 5–7.

15 Early travelers described a mound at the northern end of the Ateret site, underneath which we excavated the Mamluk mosque, see Chapter 2.

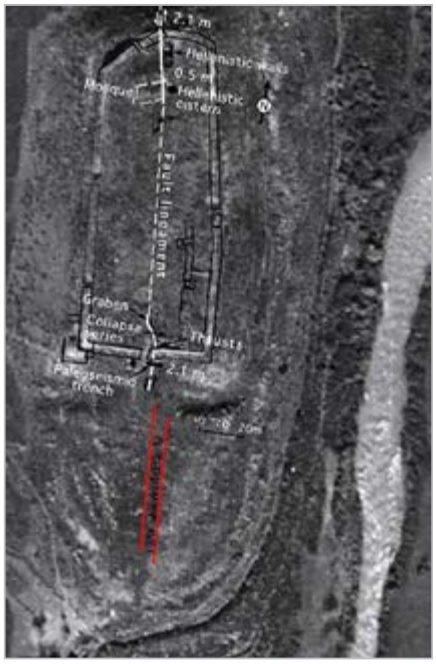



**Figure 18.2.** An aerial photo of Vadum Iacob showing displacements of structures used in the Crusader period. The fault bisects the castle. The man-made structures are indicated. The walls of the Crusader castle are displaced by 2.1 m, the Mamluk mosque is displaced by 0.5 m and one of the aqueducts (below) is displaced by 1.5 m.

**Figure 18.3.** Looking east, displacement of the Frankish walls of Vadum Iacob in Area E.

**Figure 18.4.** The displacement along the northern wall of the fortress. The amount of displacement is identical to that measured along the southern wall.

**Figure 18.5.** Ronnie Ellenblum with a 50 cm scale bar right after the excavation of the faulted northern wall, in 1994.

displacement between the two plates of Sinai and Arabia since the early Miocene is about 105 km.[16] The relative movement of neighboring plates is continuous on geological timescales. However, within the top c. 10 km of the crust (in areas of lateral slip between plates), motion is usually restrained by friction along the plate boundary. The energy that accumulates in the form of elastic strain is occasionally released in a sudden rupture along a segment of the plate boundary. Seismic waves that emanate from the rupture shake the region. Large shallow earthquakes are often associated with surface rupture, as has repeatedly happened at Ateret.

Under the supposedly uniform speed of plate motion, the duration between consecutive destructive earthquakes provides a rough indication of the energy stored in the locked plate boundaries. Any assessment of location, timing, and size of future earthquakes should be based, therefore, on knowledge of the past earthquakes along specific faults. Such knowledge is not easy to obtain. Modern seismographs supply data concerning the last few decades. Geological evidence for earthquakes typically does not lend itself to dating. It often provides mixed information regarding the location and size of past earthquakes, but seldom provides direct datable information on rupture. Written historical sources and archaeological finds provide data on the distribution of damage, but they very rarely contain information about the faults themselves and about surface rupture. The combination of history, archaeology, geology, and seismography is ideal and sometimes even essential for obtaining long and detailed earthquake records. Thus, in the case of surface rupture in Vadum Iacob, the archaeological study of geological phenomena enabled, for the first time, the precise and accurate delineation of the plate boundary. It also provided unprecedented precision and accuracy to dating and measurement of the amount of displacement of the last movements along this active fault.

Discovery of the surface ruptures in Vadum Iacob followed an older realization that earthquakes come in time-space sequences.[17] We show below that such earthquake sequences tend to progressively sweep along the DSF. The earthquake of 1202 was one of the last earthquakes in a long series of consecutive seismic events, which affected the Levant between the 11th and the 13th centuries. Reinald Röhricht counted an unprecedented sixteen earthquakes, beginning in 1033. No less than ten earthquakes were felt during the 12th century and four additional ones shook the region during the 13th century. Ambraseys added four more earthquakes to the list, reaching the number of

16 Quennell, Tectonics; Freund, R., Zak, I. and Garfunkel, Z. Age and Rate of the Sinistral Movement along the Dead Sea Rift. *Nature* 220 (1968): 253–255; van-Eck, T. and Hofstetter, A. Fault Geometry and Spatial Clustering of Microearthquakes along the Dead Sea–Jordan Rift Fault Zone. *Tectonophysics* 180 (1990): 15–27; Salamon, A., Hoffstetter, A., Garfunkel, Z. and Ron, H. Seismicity of the Eastern Mediterranean Region: Perspective from the Sinai Subplate. *Tectonophysics* 263 (1996): 293–305; Pinar, A. and Türkelli, N. Source Inversion of the 1993 and 1995 Gulf of Aqaba Earthquakes. *Tectonophysics* 283 (1997): 279–288; Klinger, Y., Avouac, J.P., Abou Karnaki, N., Dorbath, L., Bourles, D. and Reyss, J. R. Slip Rate on the Dead Sea Transform Fault in Northern Araba Valley (Jordan). *Geophysical Journal International* 142 (2000): 755–768; Meghraoui, M., Gomez, F., Sbeinati, R., Van der Woerd, J., Mouty, M., Darkal, A.N., Radwan, Y., Layyous, I., Al Najjar, H., Darawcheh, R., Hijazi, F., Al-Ghazzi, R. and Barazangi, M. Evidence for 830 Years of Seismic Quiescence from Palaeoseismology, Archaeoseismology and Historical Seismicity along the Dead Sea Fault in Syria. *Earth and Planetary Science Letters* 210 (2003): 35–52.

17 Röhricht, R. *Geschichte des Königsreichs Jerusalem (1100–1291),* (Innsbruck, 1898), 59, 100, 106, 112, 118, 218, 290, 319, 348, 382, 684, 695, 947, 993; Mayer, Two Unpublished Letters, 295.

twenty destructive earthquakes within a period of 250 years, an average of one earthquake every 12.5 years![18] The most destructive earthquakes, according to all authors, were those of 1033, 1068, 1114, 1138, 1157, 1170 and 1202. No other period in the documented history of the Levant experienced such an intensive record of active seismicity.[19]

The topic of mystical interpretations of this recurrence, such as divine punishment for the sins of the Crusaders, are beyond the scope of the present study. This chapter adopts an inter-disciplinary approach and stresses the importance of historical studies for understanding Levantine seismicity, including the assessment of future seismic hazards.

The significance of studying sequential earthquakes, and especially migrating earthquakes along a specific fault, was illustrated by the two earthquakes which destroyed cities and villages west of the Sea of Marmara on the 17th of August and the 12th of November 1999. Earlier studies pointed to the propagating nature of repetitive earthquakes. They showed that, starting in 1939 on the east and through 1967 on the west, eleven consecutive ruptures released destructive earthquakes along the North Anatolian fault. The rupture was altogether 900 km in length (Fig. 18.1). The intervals between these chiefly westward migrating earthquakes varied between 3 months and 32 years (between the 1967 earthquake and the 1999 events).[20]

In 1996 Aykut Barka, among other geoscientists who studied this sequence, identified three regions that had slipped less than their neighbors and warned that this deficit indicates possible sites of large future earthquakes. In 1997 and 1999, Stein et. al. and Armijo et. al.[21] developed a similar theory, predicting two zones of major seismic hazards, one of them being the western port city of Izmit. Unfortunately, their prediction was fully realized in 1999 by a pair of destructive earthquakes that struck the cities of Izmit and Duzce.[22]

The advance of the rupture, or the consecutive failure of a plate boundary to withstand stress, can be reconstructed through the historical sources referring to the relevant historical earthquakes. The clusters of destructive earthquakes during the 10th and 11th centuries, and more so the 12th-13th centuries, might be explained in a similar way.

The interpretation of the surface rupture of October 1759 in Vadum Iacob was also made possible by the application of a combination of historical, archaeological, and geological methods. The earthquake was previously studied by Ambraseys

18 Ambraseys, N. N. The 12th century Seismic Paroxysm in the Middle East: a Historical Perspective. *Annals of Geophysics* 47/2 (April 2004): 1–26.

19 Amiran, D.H.K. Location Index for Earthquakes in Israel since 100 B.C.E. *Israel Exploration Journal* 46/1–2 (1996): 120–130; Amiran, D.H.K., Arieh, E. and Turcotte A. E.T. Earthquakes in Israel and Adjacent Areas: Macroseismic Observations Since 100 B.C.E. *Israel Exploration Journal* 44/3–4 (1994): 260–305.

20 Barka, A. Slip Distribution along the North Anatolian Fault Associated with the Large Earthquakes of the Period 1939 to 1967. *Bulletin of the Seismological Society of America* 86/5 (October 1996): 1238–1254.

21 Stein, R.S., Barka, A.A. and Dieterich, J. H. Progressive Failure on the North Anatolian Fault since 1939 by Earthquake Stress Triggering. *Geophysical Journal International* 128/3 (1997): 594–604; Armijo, R., Meyer, B., Hubert, A. and Barka, A. Westward Propagation of the North Anatolian Fault into the nNorthern Aegean: Timing and Kinematics. *Geology* 27/3 (March 1999): 267–270.

22 Parsons et al, predict, (together with many others who basically arrived at the same conclusion) that the next major earthquake along the same North Anatolian fault system, will hit Istanbul itself. See Parsons, T. Toda, S., Stein, R.S., Barka, A. and Dieterich, J. H. Heightened Odds of Large Earthquakes near Istanbul: An Interaction-based Probability Calculation. *Science* 288 (April 2000): 661–665.

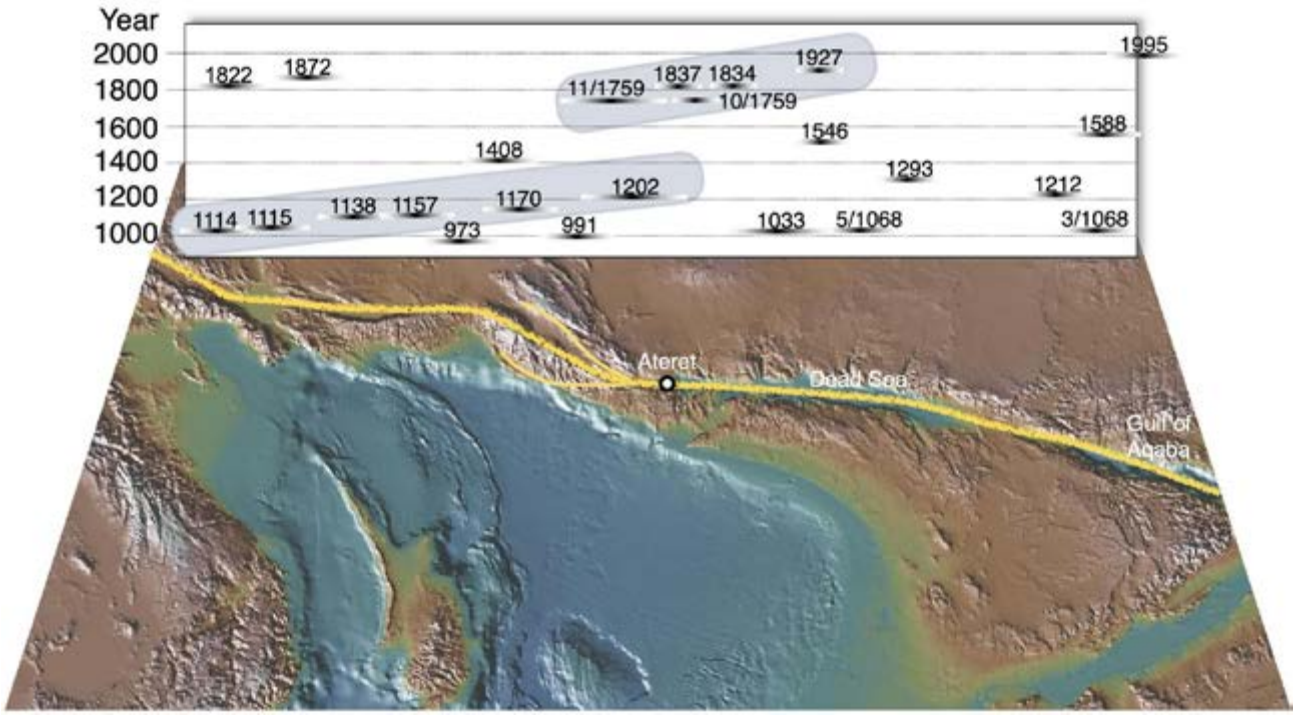



**Figure 18.6.** Earthquake sequences along the Dead Sea Fault during the 2nd millennium C.E. A less prominent sequence can be discerned for the 10th-11th centuries C.E. YF: the Yammouneh Fault.

and Barazangi,[23] who assigned the mainshock of 25 November 1759 to a surface rupture along the Yammouneh segment of the transform in Lebanon. They did however refer to a southern rupture that was the cause of a M6.6 preshock on October 30. This approach was already adopted by Sieberg, who located the maximum damage zone of the foreshock between the Sea of Galilee and the Hula Valley, close to the centers recalculated by subsequent reconstructions.[24]

Our archaeological excavations revealed that the 0.5 m surface rupture that affected the Muslim sacred site should be associated with the October 1759 and/or the 1837 shocks. The excavations made it clear that a 0.5 m offset is also discernible in the walls of the Mamluk sacred site,[25] in addition to the 1.6 m offset of the 1202 earthquake discernible in the fortress' southern and northern walls.

Only four destructive earthquakes could have caused this damage: the 1546 and 1837 earthquakes, and the two earthquakes of 1759. The

23 Ambraseys, N.N. and Barazangi, M. The 1759 Earthquake in the Bekaa Valley: Implications for Earthquake Hazard Assessment in the Eastern Mediterranean Region. *Journal of Geophysical Research* 94 (1989): 4007–4013.

24 Sieberg, A. Erdbebengeographie. *Handbuch der Geophysik* 4 (Berlin, 1932) 527–1005; Ben-Menahem, A., Nur, A. and Vered, M. Tectonics, Seismicity and Structure of the Afro-Eurasian Junction —The Breaking of an Incoherent Plate. *Physics of the Earth and Planetary Interiors* 12 (1976): 1–50. Ambraseys and Barazangi, The 1759 Earthquake, remarked that Safad and Qunayṭira suffered almost total destruction with many casualties and uprooted inhabitants. This is consistent with the surface rupture at Ateret.

25 Schweppe, G., Hinzen, K.-G., Reamer, S.K. and Marco, S. Reconstructing the slip velocities of the 1202 and 1759 CE earthquakes based on faulted archaeological structures at Tell Ateret, Dead Sea Fault. *Journal of Seismology* (2021): 1021–1042.

damage reported in the 1546 earthquake was from further south, mostly in Judea. The 1837 event triggered a landslide that destroyed Safad. as well as damaging scores of villages in southern Lebanon. Nemer and Meghraoui argue,[26] based on paleoseismic research, that the Roum Fault is the source of the 1837 earthquake; Ambraseys found that the center of the reported damage is in southern Lebanon.[27] These studies support the assignment by the excavators of Ateret of the 0.5 m shift of the Ateret mosque wall to either of two earthquakes: 30 October 1759 and/or 1 January 1837.

Three accounts of the 1759 earthquakes, written by contemporary Damascene scholars, could shed more light on the distribution of damage in the 1759 earthquake. One of these accounts was written by Kamal al-Din Ghazi al-'Amari, who functioned, during the relevant year, as the official interpreter of the Islamic jurist (Mufti) for the Shaf'ai religious school of Damascus. In his account, that was never translated into European languages, he states that the first event (30 October 1759) destroyed the regions of Nablus and Safad, killing not less than 1300 of the Jewish citizens of Safad. Some of the towers of Acre, he says, collapsed into the sea, and the cities and villages of Tiberias, Dayr Hana, Sidon, Beirut, Tripoli, Latakia, Jaffa and Haifa, together with villages in South Lebanon, were severely damaged. There was no village in the region of Jabal Druze, he claims, which was spared. The caravanserais collapsed, killing the people lodging in them. The great mosque of Damascus was also damaged, and the damage was, writes the Mufti, "only one degree less than the horrors of the day of atonement and the rising of the dead."[28] But this earthquake was only a foreshock. Widespread severe damage was felt a month later, on Friday, 27 November 1759.

At about the same time a very detailed description was written by an anonymous official based in Damascus. The report contains a comprehensive list of all the villages and public monuments, in Damascus and elsewhere, which were damaged by the earthquake. The exhaustive list contains forty-six villages, eight rural mosques, seven bathhouses, fourteen caravanserais, four water mills and two olive presses. The list of destroyed fortifications contains no less than seven castles that were ruined during this phase of the earthquake.[29] The distribution of the damage according to our historical sources is shown in Fig. 18.7.

The citadel of Baalbek was among the ruined castles; sixteen columns collapsed as a result of the earthquake. According to the Muslim chronicler Ibn al Qalānisī, the Bacchus temple in Baalbek was converted, already in the Middle Ages, into an "exceedingly formidable" fortress.[30] This temple citadel, although it suffered from repeated

26 Nemer, T. and Meghraoui, M. Evidence of Ccoseismic Rruptures along the Roum Fault (Lebanon): A Possible Ssource for the AD 1837 Earthquake. *Journal of Structural Geology* 28 8 (2006):1483–1495.

27 Ambraseys, N. N. The Earthquake of 1 January 1837 in Southern Lebanon and Northern Israel. *Anali Di Geofisica*, vol. XL, N. 4, August (1997): 923–935.

28 As noted above We revived the study a few months before what turned out to be Prof Ellenblum's early passing. Hence we could not locate all of Ronnie's sources and did not verify all statements.

29 A summary of this account was first published by Dahman, Muhammad Ahmad. Zilzal Sanat 1173, Al-Mashriq. *Beirut* 42 (1948): 332–347.

30 Ibn al-Qalānisī. *The Damascus Chronicle of the Crusades, extracted and translated from the Chronicle of Ibn al-Qalānisī.* Trans. H.A.R. Gibb (London, 1932), 98.

earthquakes,[31] withstood most of them. Lewis, in a very convincing article, succeeded in showing that nine columns of the temple peristyle remained standing throughout the Mamluk and early Ottoman periods and collapsed during the earthquake of 1759.[32] Lewis based his arguments on a comparison between a drawing of the small temple of Baalbek, made by two scholarly travelers, Robert Wood and James Dawkins in 1751,[33] and the drawings made eight years after the earthquake by James Bruce of Kinnaird (1730–1794) and possibly also by Luigi Balugani in September 1767.[34]

A simple comparison of the location of the damage during the two earthquakes indicates that the first earthquake was more pronounced in the south, and not as strong as the second, and thus the surface rupture discovered archaeologically in Vadum Iacob should be related to the October, rather than the November 1759 earthquake (Fig. 18.7). The surface rupture of the later earthquake was closer to Baalbek. This conclusion is strengthened by a report, written by the French consul in Saida (Sidon), who wrote: "…it was said that on the Baalbek side … pulling toward the plain the earth cracked for over twenty leagues. More than 30,000 persons died in various damaged locations."[35] This document indicates that a 100-kilometer-long surface rupture of the November earthquake is to be found in the Serghaya Valley near Baalbek, whereas the surface rupture of the earlier, less severe earthquake might have been discovered by us to the south, in Vadum Iacob.

Gomez and others excavated the Serghaya-Rachaya fault system on its southern reaches, in the Zabadani and Rachaya Valleys (ZV, RV in Fig. 18.7),[36] and identified a possible 18th century CE rupture. Marco and co-workers excavated grids of trenches in the Beit-Saida Valley (aka Beteiha, BV in Fig. 18.7).[37] Among several rupture events, they identified a rupture with a left-lateral offset of 0.5 m dated to the Modern Era. The results of all these paleoseismic investigations agree with

31 Poirier, J.P., and Taher, M. A. Historical Seismicity in the Near and Middle East, North Africa, and Spain from Arabic Documents (VIIth –XVIIIth century). *Seismological Society of America Bulletin* 70 (1980): 2192.

32 Lewis, N. N. Baalbek Before and after the Earthquake of 1759: the Drawings of James Bruce. *Levant* 31 (1999): 241–253.

33 Woods, R. *The Ruins of Palmyra and Baalbek*. Ed. Benjamin Anderson (London, 2021). Wood and Dawkins made no less than 44 drawings of the temple and its architectural details, based on accurate measurements that show these columns were still standing.

34 Royal Collection Trust. James Bruce of Kinnard (1730–94). Temple at Baalbec. RCIN 911626. James Bruce of Kinnaird (1730–94) — Temple at Baalbec. (rct.uk). Royal Collection Trust. Luigi Balugani (1737–70). The Temple of Venus at Baalbek c.1767. RCIN 911627. Luigi Balugani (1737–70) — The Temple of Venus at Baalbek (rct.uk)

35 For a recent translation see: Daëron, M., Klinger, Y., Tapponnier, P., Elias, A., Jacques, E. and Sursock, A. Sources of the large A.D. 1202 and 1759 Near East earthquakes. *Geology* 33 (July, 2005): 529–530.
For an earlier, less accurate, translation see Ambraseys and Barazangi, The 1759 earthquake: 4010. And see our reference to them in Ellenblum et al., Crusader castle torn apart.

36 Gomez, F., Meghraoui, M., Darkal, A.N., Sbeinati, R., Darawcheh, R., Tabet, C., Khawlie, M., Charabe, M., Khair, K. and Barazangi, M. Coseismic Displacements along the Serghaya Fault: an Active Branch of the Dead Sea Fault System in Syria and Lebanon. *Journal of the Geological Society, London* 158/3 (2001): 405–408; Gomez, F., Meghraoui, M., Darkal, A.N., Hijazi, F., Mouty, M., Suleiman, Y., Sbeinati, R., Darawcheh, R., Al-Ghazzi, R. and Barazangi, M. Holocene faulting and earthquake recurrence along the Serghaya branch of the Dead Sea fault system in Syria and Lebanon. *Geophysical Journal International*, 153/3 (2003): 658–674. Nemer, T., Meghraoui, M. and Khair, K. The Rachaya-Serghaya Fault System (Lebanon): Evidence of Coseismic Ruptures, and the AD 1759 Earthquake Sequence. *Journal of Geophysical Research: Solid Earth*, 113 B5 (2008).

37 Marco, S., Rockwell, T.K., Heimann, A., Frieslander, U. and Agnon, A. Late Holocene Activity of the Dead Sea Transform Revealed in 3D Palaeoseismic Trenches on the Jordan Gorge Segment. *Earth and Planetary Science Letters* 234/1–2 (2005):189–205.

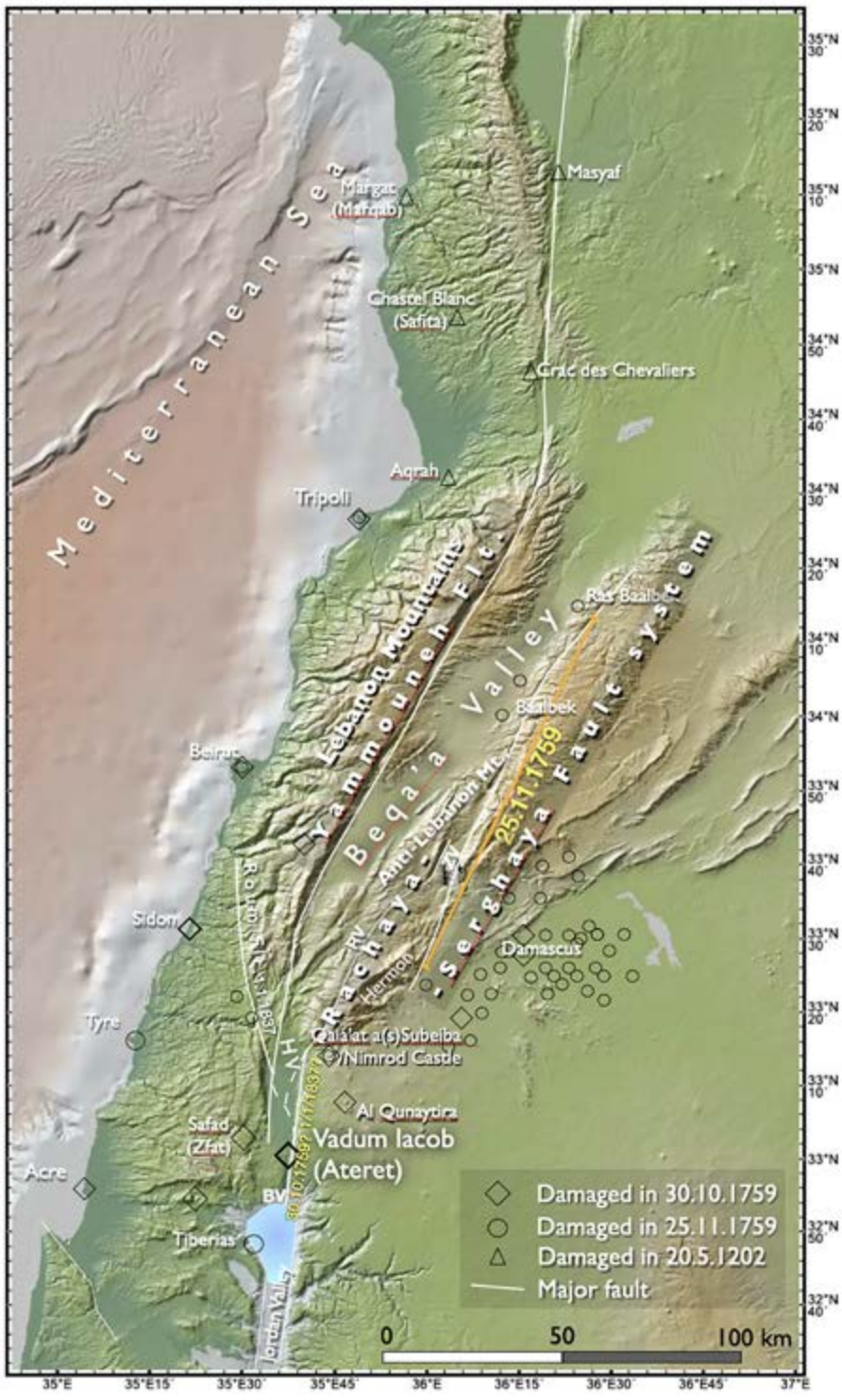



**Figure 18.7.** The settlements mentioned by the Damascene chronicles as being struck by the double 1759 earthquake and the assumed rupture zones of the earthquakes.
The orange line traces the 25 November mainshock extent, 100 km long, inferred from the report of the French Consul to Saida.

our interpretation of a rupture of the Jordan Gorge segment, perhaps from the southern Hula Valley to the northern Lake Kinneret, that generated the events of 30 October 1759 and/or 1 January 1837.

To sum up: The results of our studies of the second millennium C.E. in Vadum Iacob have demonstrated the relevance of archaeology to the interpretation of geological features. A subsequent study extended this approach to earlier periods (the Iron Age to the Hellenistic periods).[38] These studies contributed, through the reading of descriptions of earthquakes and the identification of possible field loci, to shedding light on the strength and propagation of earthquakes, and their precise and accurate dating. Such studies are crucial for the estimation of past magnitudes and could also inform us about the propagation of surface ruptures.[39]

38 Wechsler, N., Rockwell, T.K., Klinger, Y., Štěpančíková, P., Kanari, M., Marco, S. and Agnon, A. A Paleoseismic Record of Earthquakes for the Dead Sea Transform Fault between the First and Seventh Centuries CE: Nonperiodic Behavior of a Plate Boundary Fault. *Bulletin of the Seismological Society of America* 104/3 (2014):1329–1347; Ellenblum, R., Marco, S., Kool, R., Davidovitch, U., Porat, R. and Agnon, A. Archaeological Record of Earthquake Ruptures in Tell Ateret, the Dead Sea Fault. *Tectonics* 34/10 (2015): 2105–2117.

39 Marco, S. and Klinger, Y. Review of On-Fault Palaeoseismic Studies Along the Dead Sea Fault. In Z. Garfunkel, Z. Ben-Avraham and E. Kagan, (eds.). *Dead Sea Transform Fault System: Reviews* (Dordrecht, 2014): 183–205; Agnon, A. Pre-Instrumental Earthquakes Along the Dead Sea Rift. In Z. Garfunkel, Z. Ben-Avraham and E. Kagan (eds.) *Dead Sea Transform Fault System: Reviews* (Dordrecht, 2014): 207–261.

CHAPTER 19

# KUSR ATRA IN WORLD WAR I

*Uri Berger and Assaf Peretz*

Marching towards their first battle against the British Empire on the Suez Canal, Cemal Pasha's Ottoman forces stopped to feast in the Jewish colony of Rosh Pinna.[1] They celebrated their upcoming hoped-for victory against the British forces and headed south towards Egypt to join the war in the Middle Eastern theatre.[2] It would take the British Empire's forces more than three years to reach and conquer Rosh Pinna, on their way to Damascus via *Jisr Benat Yakub* (Bridge of Jacob's Daughters) and *Kusr Atra* (Fig. 19.1).[3] A few weeks after they crossed the bridge, Damascus was conquered, the Ottoman Empire surrendered and the war in the Middle East ended. By 1918, Jerusalem and southern Palestine were under British control. Commanded by General Allenby, the Egyptian Expeditionary Force (EEF) was preparing for an attack on the country's northern half. Opposing them stood Ottoman and German troops, commanded by General Liman von Sanders. On September 19, 1918, the attack commenced with the "Sharon Breakthrough," the opening act of the Megiddo Campaign. The Ottoman army collapsed and its forces surrendered or retreated in haste.[4]

By September 25th, Allenby's forces occupied the entire area between Semakh and Haifa. While General Allenby met with the commanders of his mobile forces that morning, the Ottoman armies disbanded. Both the 7th and the 8th Armies were destroyed, and the 4th was retreating towards Syria.[5] The task of capturing Damascus was given to the Australian Mounted Division together with the 4th and 5th Indian Cavalry Divisions. The forces were divided and were to arrive at the target through different routes. The 4th Indian Cavalry Division, commanded by General G. S. Barrow, was sent through Beisan (the modern town of Beit She'an) to Deraa, with a planned rendezvous along the way with the Arab forces led by Feisal and Lawrence of Arabia. The other two remaining divisions,

1 The authors would like to thank Dafna Gazit (Israel Antiquities Authority) for the two photos in Figs. 18.3–4. We would also like to thank Ayala Zilberstein, Gali B. Jaffe, and Prof. Haim Goren (Tel Hai Academic College) for their assistance in providing access to research material for this chapter.

2 Schwartz, A. Cemal Pasha Feasts in the Baron's Garden. In H. Goren (ed.) *130 Years to Rosh Pinna* (Rosh Pinna, 2010), 281. (Hebrew).

3 The authors would like to thank Anastasia Shapiro (Israel Antiquities Authority) for preparing the maps Figs. 19.1–2 that accompany this chapter.

4 Sheffy, Y. Destabilizing the Enemy: The Raid on Nazareth, 19–20 September 1918. In E. Dolev, H. Goren and Y. Sheffy (eds.) *Palestine and World War I: Grand Strategy, Military Tactics and Culture in War* (London, 2014), 172–204.

5 Gullett, H. S. *The Australian Imperial Force in Sinai and Palestine, 1914–1918* (Sydney, 1923), 738.

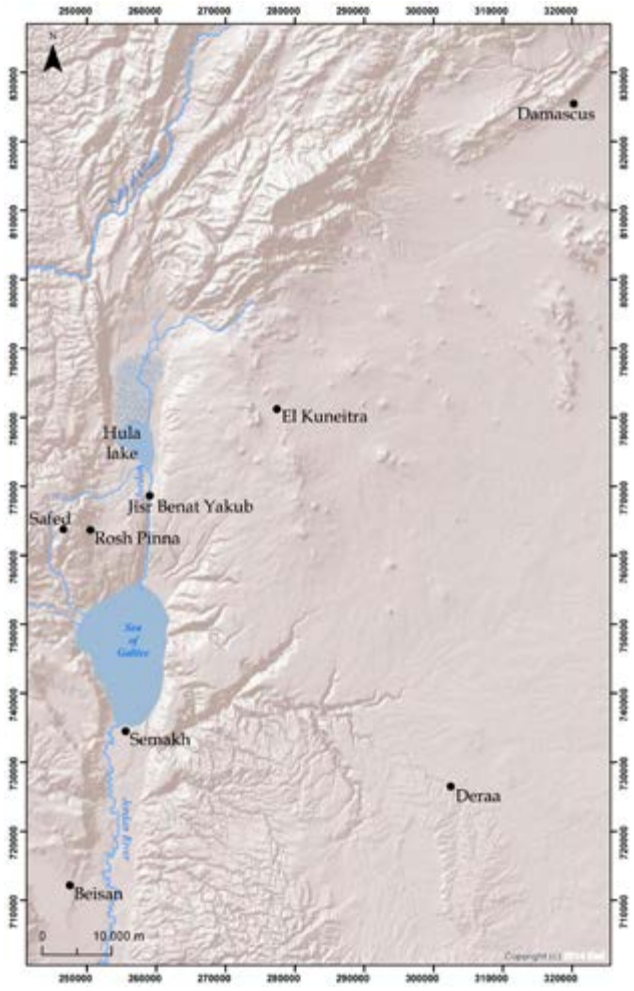



**Figure 19.1.** Northern Palestine and the road to Damascus (Anastasia Shapiro, IAA).

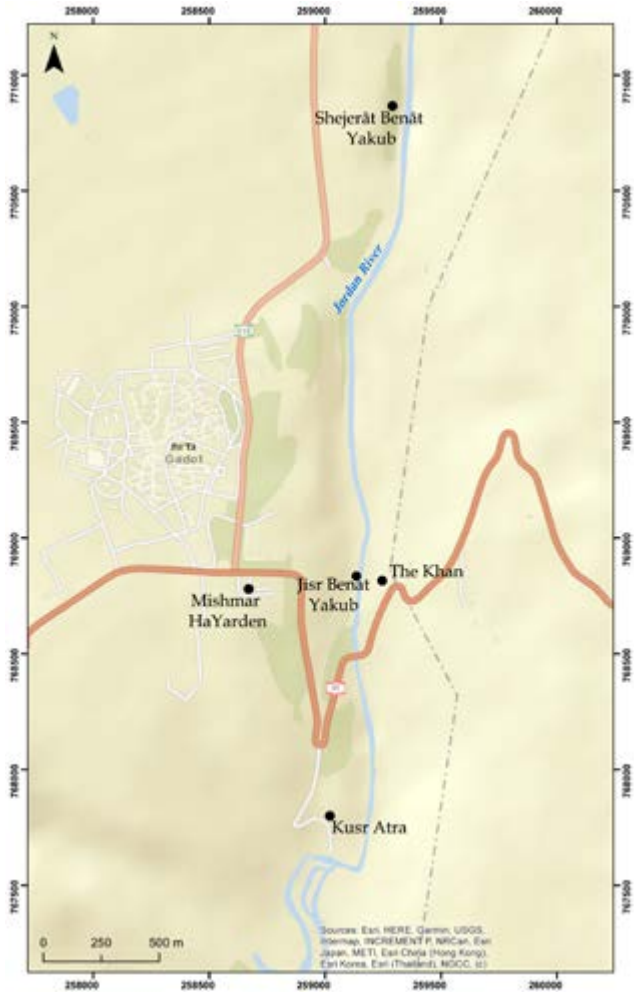



**Figure 19.2.** The positions of the British and Turkish forces.

commanded by Major General H. W. Hodgson and Major General H. G. M. MacAndrew, made their way to the meeting point through *Jisr Benat Yakub* and the Golan Heights. All the forces were to arrive at Damascus by 29 September.[6]

## The Battle of Jisr Benat Yakub

As Allenby's troops pursued the retreating Ottoman army towards Syria, the fleeing German headquarters' troops and the garrison of Nazareth crossed the Jordan River at Jisr Benat Yakub and prepared to defend this strategic pass. Their plan was to hold this position for at least 24 hours. This, they hoped, would enable them to stabilize a defensive line near Damascus. Under the command of Captain

6 Gullett, *The Australian,* 738–740.

von Keyserling, they blew up the ancient Mamluk stone-built bridge. Together with Turkish reinforcements hurried from Damascus, they held a position on the east bank of the Jordan River[7] and fortified themselves inside the stone-built khan (Figs. 19.2–4) near the eastern end of the bridge.

On September 26, around 16:00, the first Australian Mounted Divisions troops arrived at Rosh Pinna. Commanded by Major Clive Bleechmore, the 'A' squadron of the 9th Light Horse Regiment (LHR) occupied this small Jewish colony, the adjacent Arab village of al-Ja'una, and the neighbouring city of Safed. 'A' Squadron then sent a patrol to the area of Jisr Benat Yakub on the morning of September 27. Helped by local guides and using the military maps that were based on those of the PEF (Palestinian Exploration Fund), the Australians learned about the fords of Vadum Iacob, located near Kusr Atra, to the south of the demolished bridge and about possible crossing areas close to the Hula Lake.[8]

While Bleechmore's troops were trying to estimate the strength of the German and Ottoman forces, they drew fire from the eastern bank, about 2,000 yards from the river, near the Jewish colony of Mishmar HaYarden. Patrol airplanes surveyed the area and confirmed Bleechmore's estimation of the enemy force at about 600 to 800 soldiers, holding positions on the Jordan river's eastern bank. One of these airplanes was shot down by the German and Ottoman forces.

While waiting for further orders and for the rest of the division to arrive, the Imperial British offensive operation at Jisr Benat Yakub began, with the Nottinghamshire Royal Horse Artillery battery bombarding the German and Ottoman positions.[9]

The west bank of the Jordan (Fig. 19.5) was highly exposed to the enemy.[10] It provided few hiding places besides the abandoned buildings on the western bridge's end and some "insignificant ruins of the castle of Baldwin IV" on top of Kusr Atra's mound.[11]

At 14:30 an order was given to cross the Jordan River.[12] The 4th, 12th, and 14th LHR of the 5th LH brigade, supported by four machine guns and 'A' Battery HAC (Honourable Artillery Company), were in charge of the southern manoeuvre.[13] The attack began with the French *Regiment Mixte de Marche de Cavalerie,* of the 5th Light Horse Brigade, assaulting the buildings near the western side of the bridge. Dismounted, they advanced towards the buildings and captured it under heavy

7 Preston, R. M. *The Desert Mounted Corps: An Account of the Cavalry Operations in Palestine and Syria, 1917–1918* (London, 1921), 248–257; Falls, C. *Armageddon: 1918* (Annapolis, 1979), 112.

8 Grainger, J. *The Battle for Syria, 1918–1920* (Woodbridge, 2013), 162; Keller, H. The Brits are coming. In H. Goren (ed.) *130 Years to Rosh Pinna* (Rosh Pinna, 2010), 281 (Hebrew); AWM10/13/39*,* War diary of the 8th Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1351913.

9 AWM4 10/14/43, War diary of the 9th Australian Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1351613; AWM4 10/3/44, War diary of the 3rd Australian Light Horse Brigade, September 1918 https://www.awm.gov.au/collection/C1351379

10 Gullet, *The Australian*, 740; Preston, *The Desert*, 258; See Campbell's photograph of the bank as taken from the eastern banks, where the Ottomans and Germans held their positions: Campbell, J. P. (AWM B00298, 1918).

11 Preston, *The Desert*, 258.

12 AWM4 10/14/43, War diary 9th LHR; AWM10/13/39 War diary 8th LHR.

13 Gullet, *The Australian*, 740–742; Preston, *The Desert*, 260. AWM10/13/39, War diary 8th LHR; AWM4 10/14/43, War diary 9th LHR; AWM4 10/3/44, War diary 3rd LHB; AWM4 10/14/45, War diary of the 4th Australian Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1355149; AWM4 10/15/39, War diary of the 10th Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1352128


**Figure 19.3.** Sketch of the captured Turkish machine gun post at Jisr Benat Yakub near the Jordan River (1919). Ivers, T.H. *'The Khan'* (AWM ART02616, 1918) https://www.awm.gov.au/collection/C176270.

**Figure 19.4.** The Mamluk Khan that served as the German-Turkish position on the east bank of the Jordan River (photo Uri Berger).


**Figure 19.5.** View of the western bank of the Jordan River photograph taken from the enemy side. Campbell, J. P (Australian War Memorial B00298, 1918)

fire, suffering several casualties.[14] The 4th LHR was the first to cross the Jordan river at the fords south of Kusr Atra, followed by the 14th LHR. Stuck in the harsh, bushy terrain of the river's east bank, the attack had come to a halt, the forces unable to attack the Ottoman positions from the south.

The 3rd Brigade, headed by the 10th LHR, was ordered to set out northward and cross the Jordan River at Shejerât Benât Yakub, located at the southern edge of Lake Hula (Fig. 19.2). The 10th LHR started crossing at dusk and at about 18:15 the regiment crossed the river and began moving south. While the regiment was moving towards the Ottoman positions, a force under the command of Lt. Macnee moved at dark in an area with thick vegetation, when he encountered an Ottoman outpost at

14 Gullet, *The Australian*, 740–742; Preston, *The Desert*, 260. The buildings on the western side of the bridge— the colony of Mishmar HaYarden— like the bridge itself, were destroyed during the last hundred years. They can be seen as they were at the end of WW1, in paintings and photographs made at that time. See Hurley, J. F. *The stone bridge over the river Jordan, near the lake of Tiberias* (AWM B01796, 1918) https://www.awm.gov.au/collection/B01796; Mcbey J. *Jisr Benat Yakub* (IWM Art. IWM ART 1559,1918) https://www.iwm.org.uk/collections/item/object/18041

close range. The enemy surprised them and caused a few casualties, but Macnee and his force reacted quickly and conducted a bayonet charge that ended with the Australian flanking the Ottoman outpost. This short engagement ended with one dead and six wounded Australians, including Macnee himself, who was severely injured. The Australians captured 12 German and 41 Ottoman prisoners, together with two machine guns and one lorry.[15] This successful attack, together with the crossing from the south side, were the main reasons for the Ottoman withdrawal during the night. The latter ended the battle at Jisr Benat Yakub. Early in the morning of September 28, the Australian Mounted Division crossed the Jordan towards Damascus via al-Kuneitra.[16]

## The finds

Three rifle casings (Figs. 19.6–7) and one button (Fig. 19.8) of the Manchester regiment were found in Area B (Fig. 19.8). The three rifle casings (L201, B2033; Fig. 19.6) are British 0.303-inch small arms ammunition manufactured by Kings Norton Metal Co., in 1915 (Fig. 19.7).[17] All three were fired, as evident by striking marks on their primer.

Kusr Atra was a dominant hill located opposite the centre of the Ottoman army's line of defense. In the war diary of the 8th Australian LHR, it is mentioned that the HQ and the initial position of the battalion was near Kusr Atra.[18] As noted by Preston, the area lacked cover besides the ruins


**Figure 19.6.** Three rifle casings of 0.303-inch small arms British ammunition.

**Figure 19.7.** Cartridge base of rifle casing.

15 AWM4 10/15/39, War diary 10th LHR*;* AWM4 10/3/44, War diary 3rd LHB; AWM28 2/145, Honours and Awards (Recommendation), Henry MacLachlan Macnee https://www.awm.gov.au/collection/C1380240

16 AWM4 10/4/21, War diary of the 4th Australian Light Horse Brigade*,* September 1918 https://www.awm.gov.au/collection/C1351880; AWM4 10/3/44, War diary 3rd LHB; Gullet, *The Australian,* 741; Preston, *The Desert*, 260–261.

17 Edwards, A.O. *303 inch British Service Ammunition* (Canterbury, Kent, 2011): 122.

18 AWM10/13/39*,* War diary 8th LHR.

of the Crusader citadel at Kusr Atra. We assume that an Australian unit was stationed at the site and fired on the opposing Ottoman forces, both suppression fire for the crossings or simply as part of an exchange of fire between the two sides. The number of casings recovered does not match the first suggestion of suppression fire. Still, one needs to remember that according to Israeli law, antiquities are defined as manmade objects dated earlier than 1700 CE. Hence it is possible that the site had many more spent casings that were either collected by visitors over the years or discarded by the excavators.

The button's obverse (Fig. 18.8a) depicts a sphinx resting on a tablet inscribed EGYPT and the inscription: HONI SOIT QUI MAL Y PENSE. The inscription on its reverse (Fig. 19.8b) shows that it was made by Firimin in London. This button belongs to the Manchester regiment.[19] The 1st Manchester regiment served on the Palestine front during WWI and took part in the Megiddo campaign. Owing to the quick collapse of the Ottoman army, the cavalry and other mounted troops took the lead in the pursuit after its retreating units. The Manchester regiment reports that after a short stop for rest and reorganization, it was deployed mainly to collect loot, escort prisoners, maintain and create roads and other tasks that were required after such a fast manoeuvre and advance.[20] We assume this button adorned a coat, most likely worn by an NSO or an officer, and detached from the coat while the regiment was active in the area after the battle ended.[21]


**Figure 19.8.** Button from a coat of an NSO or officer from the Manchester regiment.

19 Wylly, H. C. *History of the Manchester Regiment (later the 63rd and 96th Foot)* (Uckfield, England, 2005): 199–200.
20 Ripley, H. *Buttons of The Regular Army 1855–2000* (Surbiton, Surrey, 2002): 44–45, see item 383.
21 Wylly, *History of the Manchester Regiment*: 200. The battalion was stationed near Jaljulieh on September 29th (near the modern town of Kfar Saba), and may have moved further north to Jacob's Ford once the battle ended.

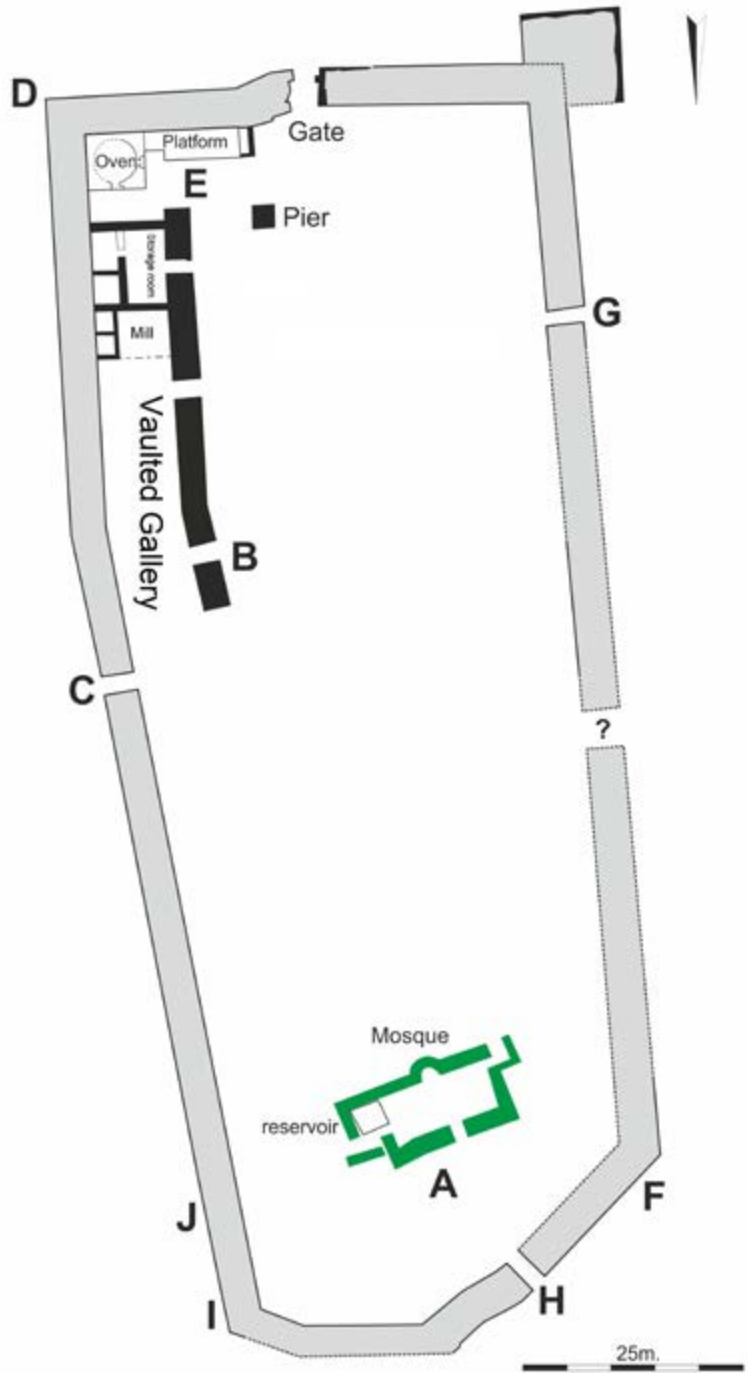



**Figure 19.9.** Plan of the Crusader fortress at Jacob's Ford, with excavation areas marked in capital letters.

CHAPTER 20

# EPILOGUE

Approximately a month after Professor Ronnie Ellenblum's sudden death, Dr. Uri Davidovich, who participated in the excavation and was part of our team, suggested we should dedicate the archaeological report of Jacob's Ford to Ronnie's memory. The material from the twelve seasons of excavation was fairly well organized in a storage room at the Hebrew University, waiting to be published. It was a bit terrifying to begin with, getting re-acquainted with the site after so many years, sifting through numerous boxes of pottery and animal bones, searching for detailed information in the daily logs, and examining hundreds of photographs. It was a true challenge to find all the physical objects and provide the detailed information gathered in the excavation so many years ago and pass it on to each author so that he or she could complete their research and write their chapter. At one point Robert Kool phoned to enquire about a specific rare "non-royal coin." "Did you see it while you were going through the material in the storage room or in Ronnie's office?" asked the worried numismatist. It was found in the IAA's safe — a happy conclusion. Locating the animal bones required three people (Hadas Motro, Shai Scharfberg and me), two vans, and a lot of burrowing in three large, dusty, smelly sheds. A horrible job. Luckily, the company was great.

When the drafts of the different chapters began to arrive, and the translation of the Arabic sources was completed, the work became significantly more interesting — a complex and intriguing web of evidence. The fortress in relation to the political and military events in the region, as well as the details of the siege, life in the fortress while it was being constructed and in the Mamluk hamlet, were gradually revealed. Writing the story of the fortress, relying on the written sources (written only by the winning side) combined with the information gleaned from three-dimensional objects that can be held in the palm of the hand, demands a great deal of caution. The overwhelming quantity of material may give the reader a feeling that the case is clear cut, that we know exactly what happened at each stage of the short period this fortress existed. There are, however, a number of questions that we could not answer, no matter how carefully we read the material and examined the finds. Bridging the gap between the archaeological evidence and the written sources was not always possible.

I hope that we have managed to tell the story of this intriguing site, exhibit its finds, describe and explain their contexts, and perhaps share some

of the excitement that we all felt when they were excavated during hot Israeli summers or on the first rainy day of autumn. Perhaps some of the questions will be solved by others; seasoned historians and archaeologists or curious students, using new, more advanced methods, or just by simply examining the finds and sources again and finding fresh and different angles to study them.

*Kate Raphael*
*March 2022*

# OBITUARY FOR RONNIE ELLENBLUM 1952–2021

*Reuven Amitai*[1]

The historian and geographer Ronnie Ellenblum passed away suddenly on 7 January 2021 at the age of 68. Ronnie's work combined the ancient, medieval, and modern history of the Mediterranean area and the Middle East, historical geography, archaeology, urban studies, historical sociology, digital humanities and geology. He was equally at home reading medieval Latin texts, traipsing around the countryside (or the alleys of medieval cities), and examining objects, maps and photographs in the laboratory, the museum or on the computer. While he is probably best known for his studies of Palestine under the Franks in the 12th and 13th centuries, he made significant contributions to the study of the history of the wider Middle East and the Muslim peoples (as well as their *dhimmi* subjects). He had only a rudimentary command of Arabic (written and spoken) and had little formal training in Islamic and Middle Eastern studies, but he was also very much a part of the Middle Eastern Studies milieu in Jerusalem and beyond: he was certainly a close associate and friend of many of us. I think that he would have been very pleased to know that his obituary appeared in *HaMizrah HeHadash*, the journal of The Middle East & Islamic Studies Association of Israel. His obituary has also been published in journals and other platforms of many different disciplines.

Ronnie was born in 1952 in Beersheva to a working-class family. His first name was actually Aharon, after his uncle who fought as a partisan against the Nazis and was murdered in a pogrom in Poland just after the war. After his army service and travelling — he spent a year in India — he began his studies in geology at the Hebrew University. Finishing up, he thereupon spent the next years travelling, teaching in the Experimental High School in Jerusalem, and working for the Israeli Society for the Preservation of Nature. Only then was he ready to go back to academic studies. Starting in 1984, he worked on his MA in the Department of Geography under the aegis of Yehoshua Ben-Arieh. At the same time, he began his relationship with the History Department, studying with B. Z. Kedar. This was a winning ticket: textual history combined with a deep and thorough understanding of human geography through the ages; or if one wishes, a happy marriage between humanities and social science, between attention to the smallest details, the wider historical context and change, and then looking at the widest possible picture. Even then, Ronnie's ability to think outside the box, to never

1 Professor Reuven Amitai, The Department of Islamic and Middle Eastern Studies and the Institute of Asian and African Studies, The Hebrew University of Jerusalem.

take for granted accepted wisdom and to ask big questions was getting noticed.

Ronnie's MA thesis established a set of objective criteria for Frankish rural construction during Crusader times, as a prelude to examining the extent of Frankish settlement in the Levant (particularly Palestine) and thus their relations with the local population. Such criteria included mason marks, methods of dressing stone, cement (his training as a geologist held him in good stead), construction techniques and decoration. This, in itself, was an important contribution, but at the same time he was preparing his first overturn of accepted wisdom. Starting as a seminar paper, Ronnie unequivocally showed that Qal`at Namrud/Nimrod (or al-Subayba as it is called in Arabic) in the Golan Heights was not a Crusader castle, but built by the Ayyubids in the late 1220s, at a particular juncture of Frankish-Muslim relations and inter-Ayyubid struggles.[2] Again, here was history (of both the Franks and the Muslims), archeology, *Baugeschichte*, epigraphy, and more, called into play: a historical geographical case study at its best.

From 1987 Ronnie worked on his Ph.D. dissertation, again under the supervision of Kedar and Ben-Arieh, this time on Frankish rural settlement. Here he took on directly the thesis of J. Prawer (and others, notably R. C. Smail) that the Franks were primarily an urban-based population; alienation from and fear of the local Arabic-speaking population — even the Christians among them — kept them behind castle and city walls. Ronnie, however, clearly showed the opposite was the case, combining Frankish literary sources with extensive surface archaeology, not least in the West Bank. It turns out that the country was dotted with Frankish villages and especially fortified manor houses, mainly in areas where local indigenous Christians lived. *En passant*, Ronnie also showed that much of the rural population was still Christian, albeit completely Arabized, and in some parts of Palestine there was still even a clear Christian majority. When the revised version of this study was published in 1998 as *Frankish Rural Settlement in the Latin Kingdom of Jerusalem*,[3] it caused quite a stir in Crusader studies circles, but also among those interested in the medieval history of Palestine and Islamization.

By now Ronnie was firmly ensconced in the Hebrew University's Department of Geography, but also maintaining connections with the Department of History and with some members of the Department of Islamic and Middle Eastern Studies. His next big project was a study of the whole gamut of Frankish fortifications in the East. Much of the impetus for this project was the excavations of the Crusader fortress Vadum Iacob ("Jacob's Bridge", near Jacob's Daughter's Bridge (*Bayt al-Ahzan* in Arabic and *Metzad `Ateret* in Hebrew), which he directed together with the archaeologist Prof. Adrian Boas and others. The Franks, under the leadership of the king himself, commenced the building of the castle in the fall of 1178, and less than a year later, it was stormed and taken by Saladin. It had never been properly examined, let alone excavated systematically. This was a remarkable find: all construction and artifacts could be dated almost exactly. Secondly, since disease broke out among the victors almost immediately after the conquest, much would-be booty was left in place. The rapid withdrawal resulted in two extremely interesting

2 Ronnie Ellenblum, Who Built Qal'at al-Ṣubayba? *Dumbarton Oaks Papers* 43 (1989): 103–112.

3 Ellenblum, R. *Frankish Rural Settlement in the Latin Kingdom of Jerusalem* (Cambridge, 1988). This, like his subsequent books, were published by Cambridge University Press.

finds: a group of complete human skeletons, clearly Franks who had been wounded and died, or, more probably, executed, and another group of complete horse skeletons. Both these finds enabled comprehensive studies of battle-related wounds and the health and nature of humans and their horses from the Crusading Kingdom. The best, however, was yet to come. It turns out that the fort is located exactly on the Syrian African Rift fault, the site of substantial tectonic movement. In fact, one side of the castle had moved several meters in relation to the other. The geologist in Ronnie understood right away what he had stumbled across and how important it was. Calling on friends from his undergraduate studies, now professors of geology, a whole field of research was embarked upon. While not exactly Middle Eastern studies nor even Crusader studies; the history of earthquakes certainly impinges on the region's history. In any event, I am not sure that the average historian or archaeologist would have made much note of this find. It took a historian and geographer-*cum*-geologist to see the forest for the trees here.

But back to Crusader castles: Ronnie's second monograph was *Crusader Castles and Modern Histories* (2007), to my mind still the last word on the topic of Frankish fortifications.[4] Here he traced the development of the concentric castle — one ring of fortifications around another, often higher, ring. This developed as an answer to the siege technology of the Muslim armies, with both its "artillery" (most importantly, at this stage, traction trebuchets) and mining techniques. In fact, here, as on the open field, we find an ongoing "dialogue" between the Muslim and Frankish military classes, each side reacting and coping with the most recent technology and tactics of the other. But that is not all; the book starts with a short monograph on how the study of the Crusades, and particular Crusader castles, have been worked into modern European historiography and national discourse. Two studies for the price of one — quite a feat for a medievalist!

Yet even while originally devoting himself to the history of the Crusades and the Franks in the East, from the beginning Ronnie asked big questions that impinged upon the entire Middle East, the Mediterranean, Central Asia and beyond. Sometime in mid-career, he began investigating matters related to the interplay of climate and historical change throughout this large region, and this resulted in a pioneering monograph on the coming of Turkish nomads from the Eurasian steppe to the Middle East in the 11th century and their decisive impact on Middle Eastern history. Ronnie was returning, once again, to his roots in geography, using historical sources of various types to extract climatic data (a pioneering method, I should add). The result was his 2012 book, *The Collapse of the Eastern Mediterranean: Climate Change and the Decline of the East, 950–1072,* showing the decisive role of climatic crisis in the coming of the Turkish tribes to the Middle East in the early 11th century and the rise of the Seljuq dynasty and their ability to gain control over much of the region with such speed.[5] While some scholars may have some reservations about the full extent of this climatic impact, no one can now disregard the role that climate played, so convincingly laid out by Ronnie in this study. Ronnie's last study — this time looking at social fragility attributable to climatic vicissitudes — was

4 Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007).

5 Ellenblum, R. *The Collapse of the Eastern Mediterranean: Climate Change and the Decline of the East, 950–1072* (Cambridge, 2012).

devoted to the ancient Mediterranean world. As the draft of this monograph was still being edited at the time of his death, I haven't seen the full text, so I won't comment on it. But I have no doubt that this book too will be stimulating and well-received, making its own waves.

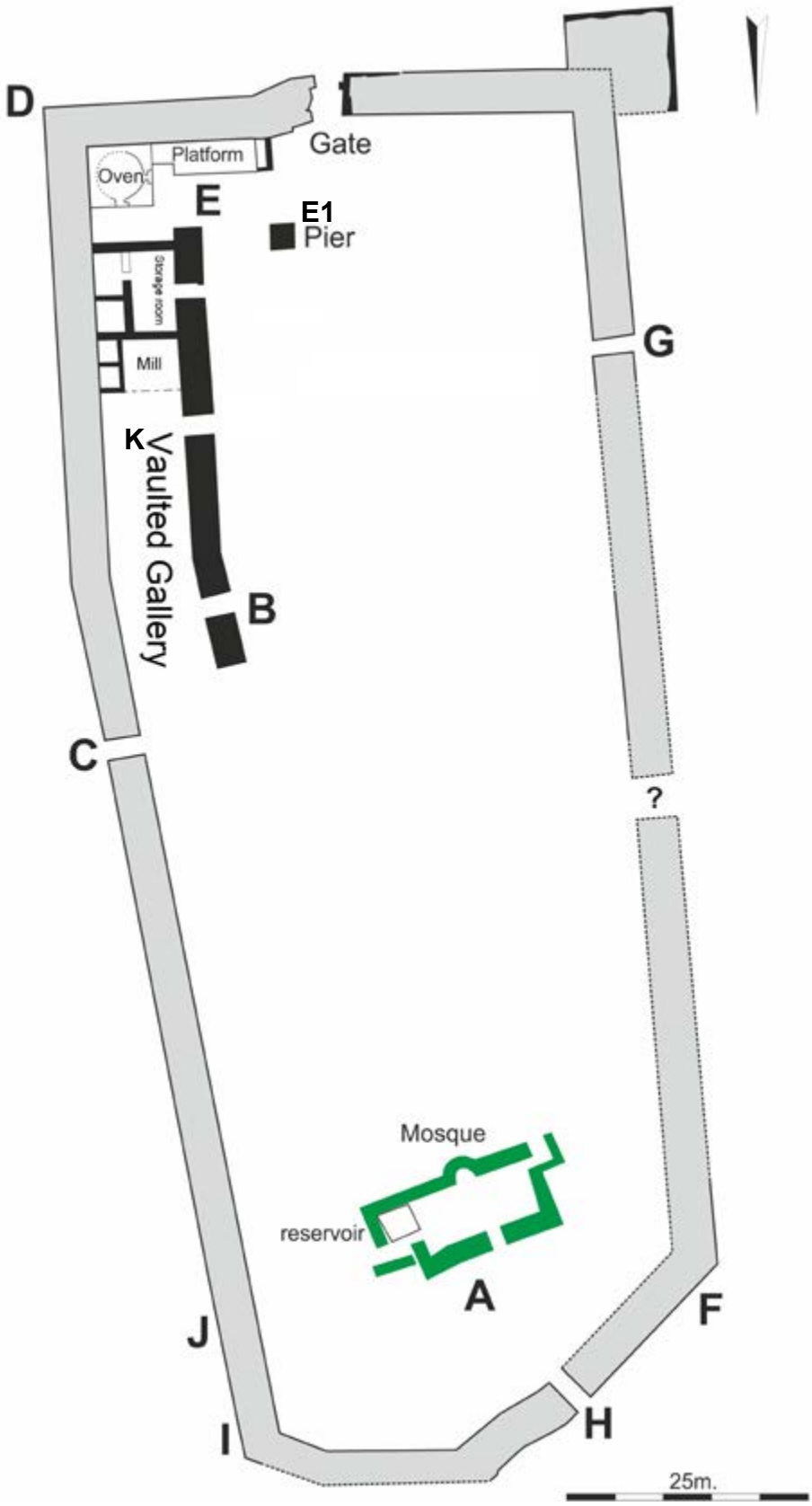
Ronnie was a remarkable teacher and supervisor, constantly thinking of new ways to present material to students and at the cutting edge of adapting new technologies for pedagogical purposes. Having worked with him more than once as a co-supervisor, I was struck by his attention and solicitousness for his students. He was active in university life and stood at the forefront of initiatives to improve conditions for both students and staff. In the latter capacity, he was the head of the professors' union at the Hebrew University, leading us to victory in the big strike of 2007. Ronnie was also a public activist in Jerusalem, particularly to ensure the preservation of the unique physical remnants of Jerusalem's past in the face of the unceasing efforts of rapacious contractors to destroy or damage them and the weakness (or worse) of politicians. Early in the 2000s, he also launched a well-funded project with Palestinians to explore the history of Jerusalem. For several years Ronnie served as head of the School of History at the Hebrew University but was unsuccessful in his later endeavors to establish more senior positions at the university. In 2017 he was elected to the Israeli Academy of Sciences and Humanities, the pinnacle of his career in many ways.

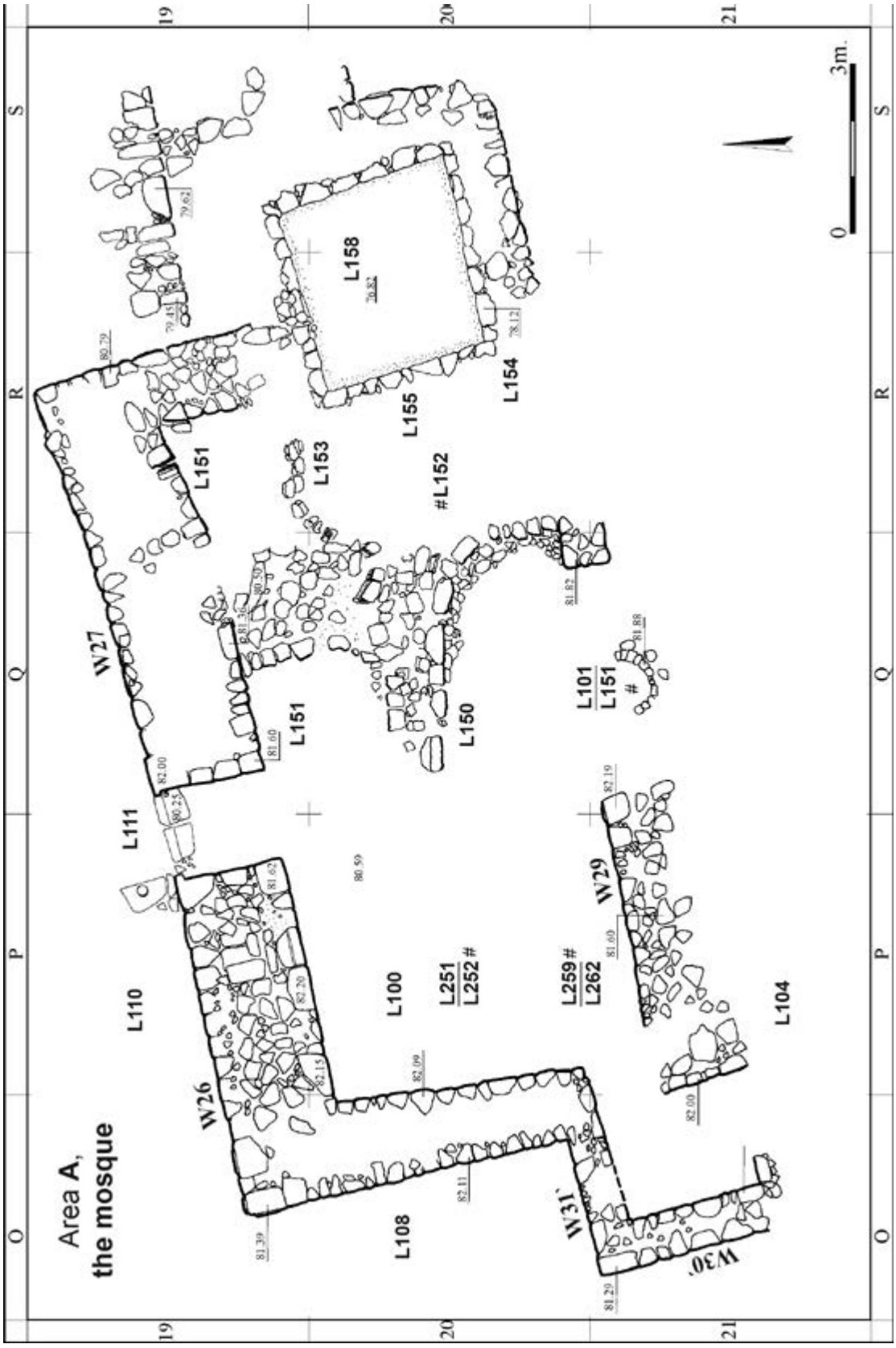
Though at times relations with him could be stormy, and his opinions, academic and otherwise, were held strongly and adamantly, Ronnie was noted for his warm and effusive personality. He was always a devoted friend and a loyal colleague, a true mentor to many, and an exemplary family man.

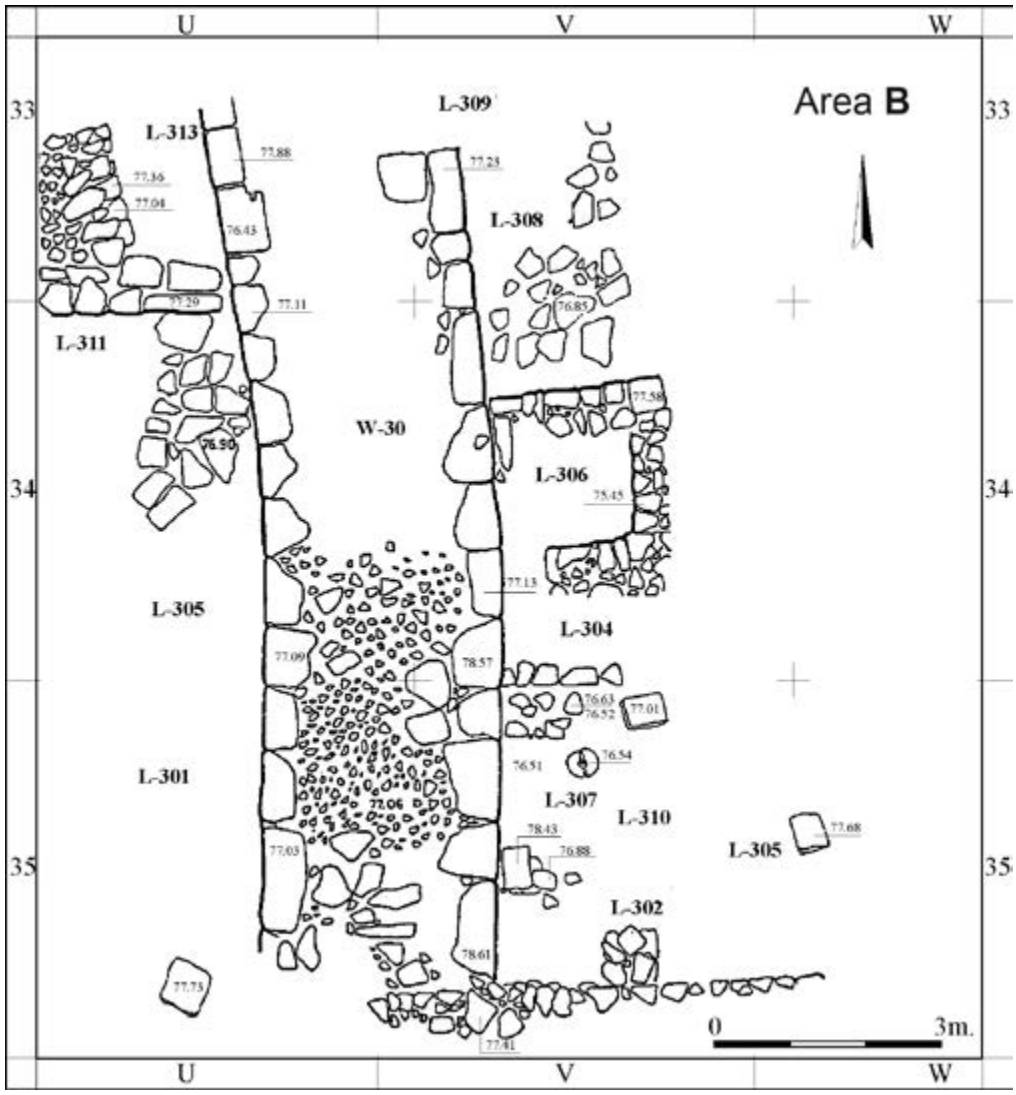
יהי זכרו ברוך

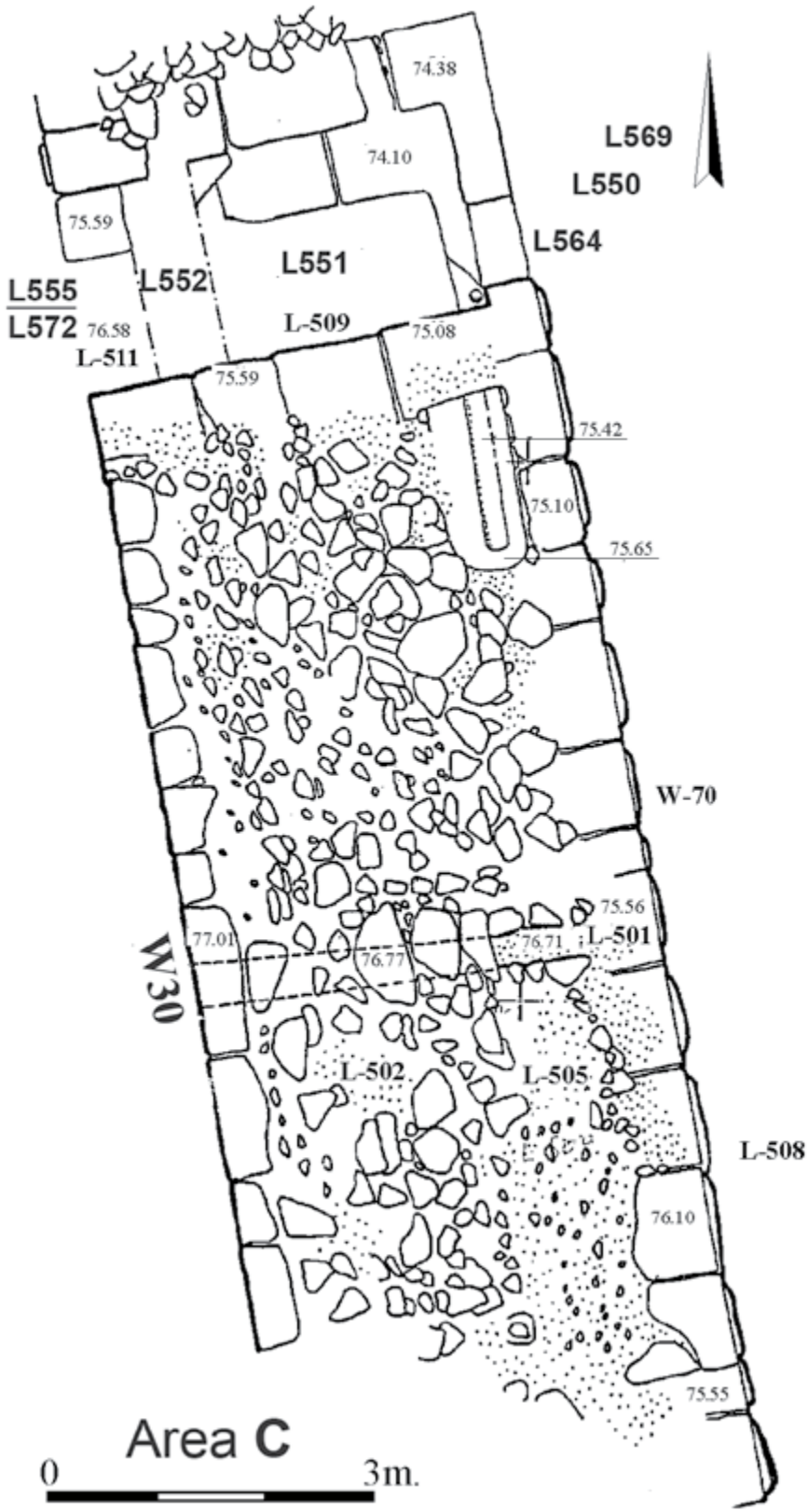
APPENDIX:

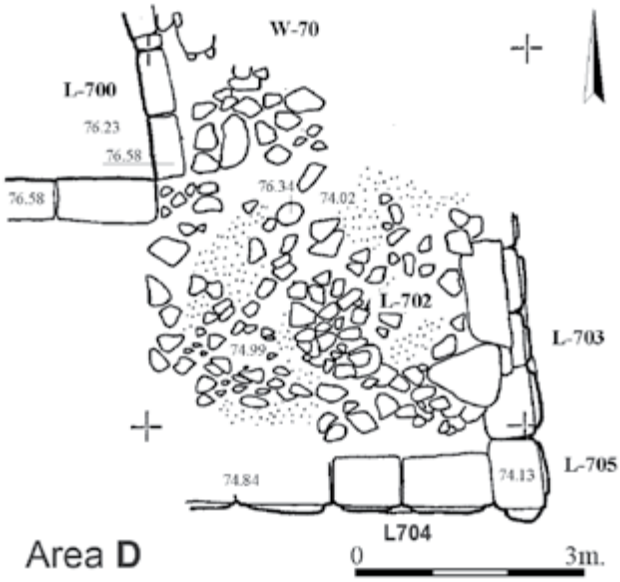
# AREA PLANS


D
Gate
Platform
Oven
E
E1
Pier
Storage room
Mill
G
K
Vaulted Gallery
B
C
?
Mosque
reservoir
A
F
J
H
I
25m.

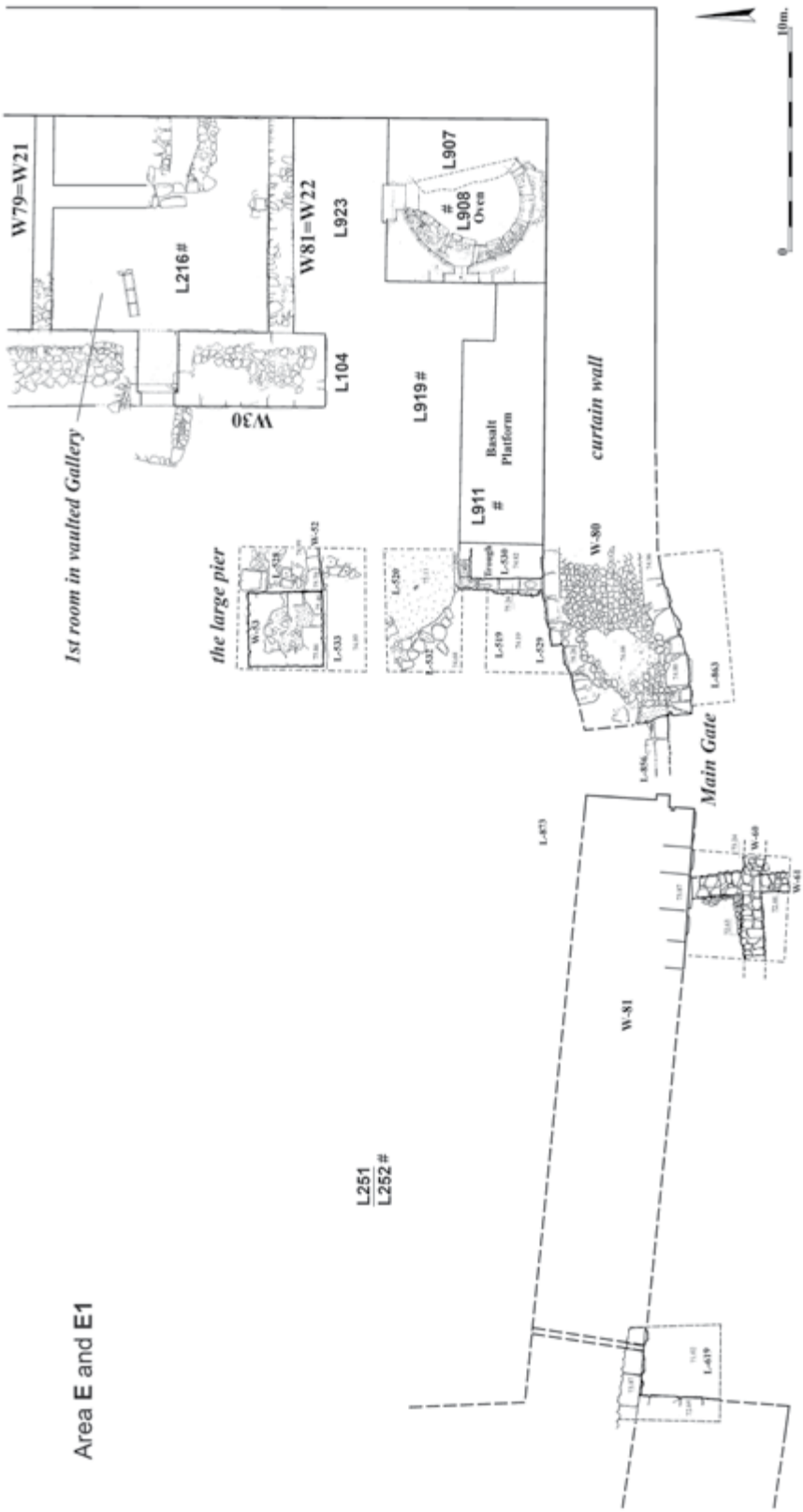

Area A,
the mosque
W27
W26
W31`
W30`
W29
L111
L110
L108
L100
L151
L153
#L152
L155
L158
L154
L150
L101
L151
#
L251
L252 #
L259 #
L262
L104
0
3m.

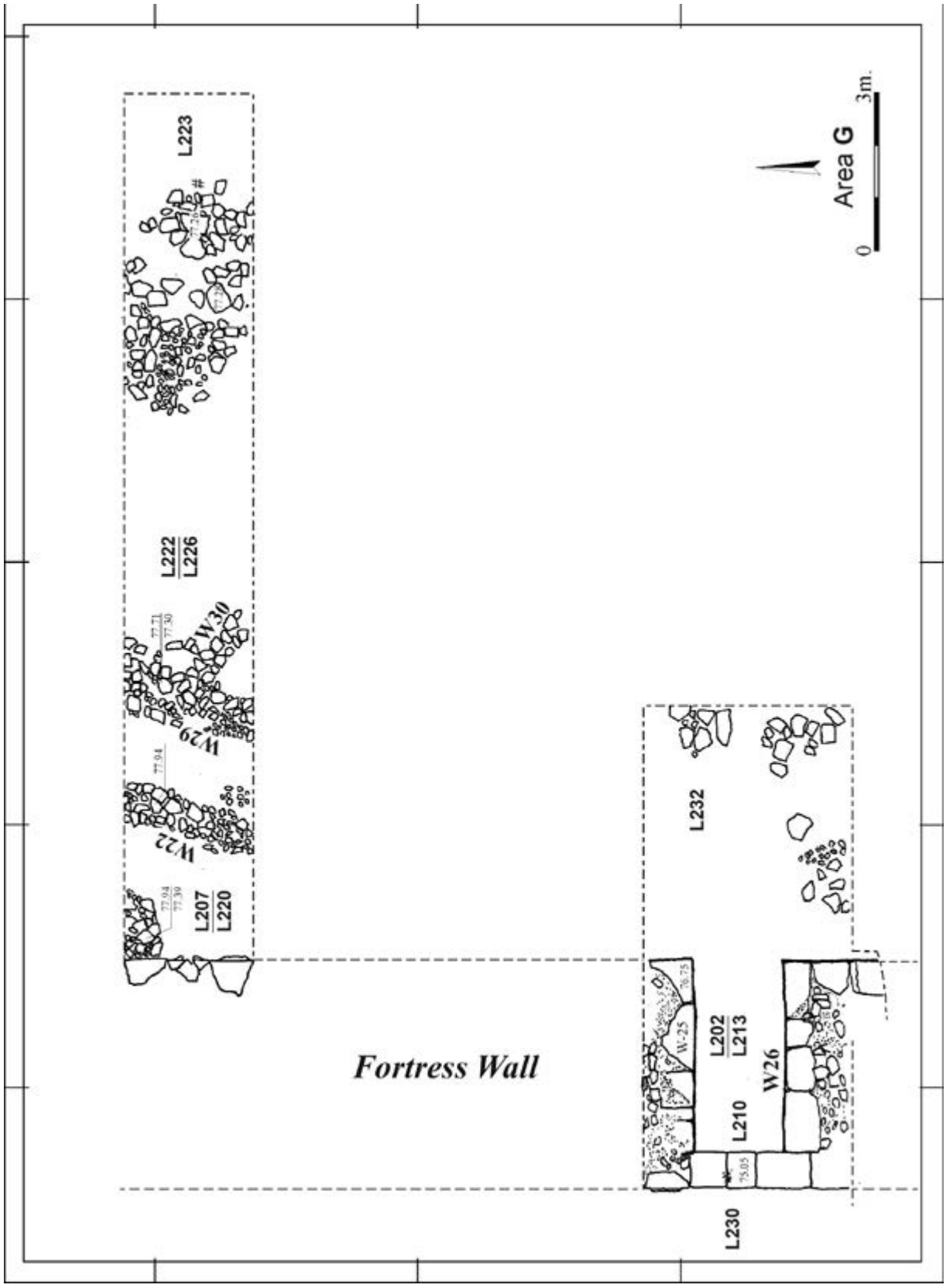

U
V
W
33
34
35
Area B
L-309
L-313
L-308
L-311
W-30
L-306
L-305
L-304
L-301
L-307
L-310
L-305
L-302
0
3m.

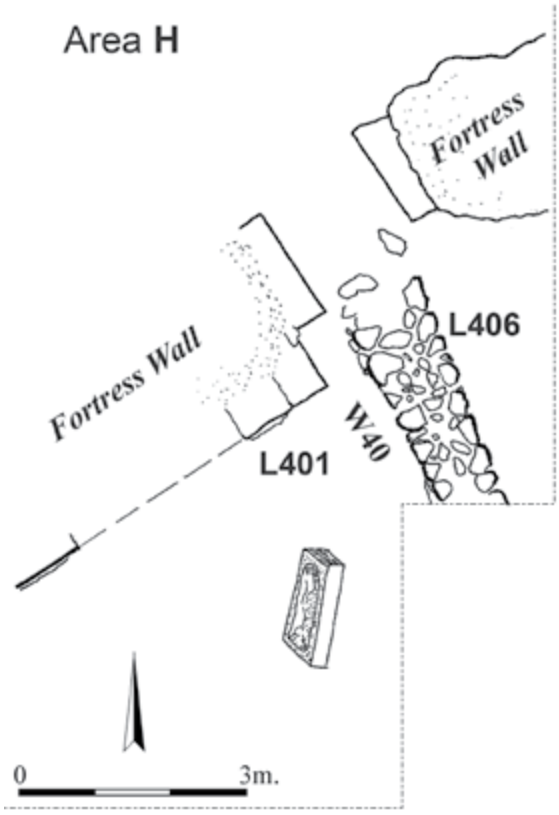

74.38
74.10
L569
L550
75.59
L564
L551
L555
L552
L572
76.58
L-509
75.08
L-511
75.59
75.42
75.10
75.65
W-70
75.56
77.01
76.71
L-501
76.77
W30
L-502
L-505
L-508
76.10
75.55
Area C
0
3m.

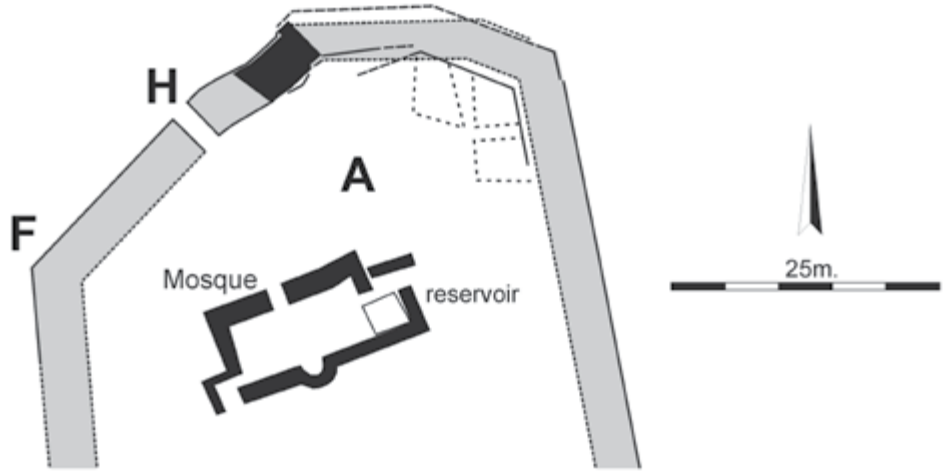

W-70
L-700
76.23
76.58
76.58
76.34
74.02
L-702
L-703
74.99
L-705
74.84
74.13
L704
Area D
0
3m.


P
Q
R
Area E,
the Gate
43
44
L-802
L870
L873
74.50
75.89
75.52
74.84
74.83
L-805
L-801
L-803
74.61
74.80
75.06
75.61
75.43
L-804
0
3m.

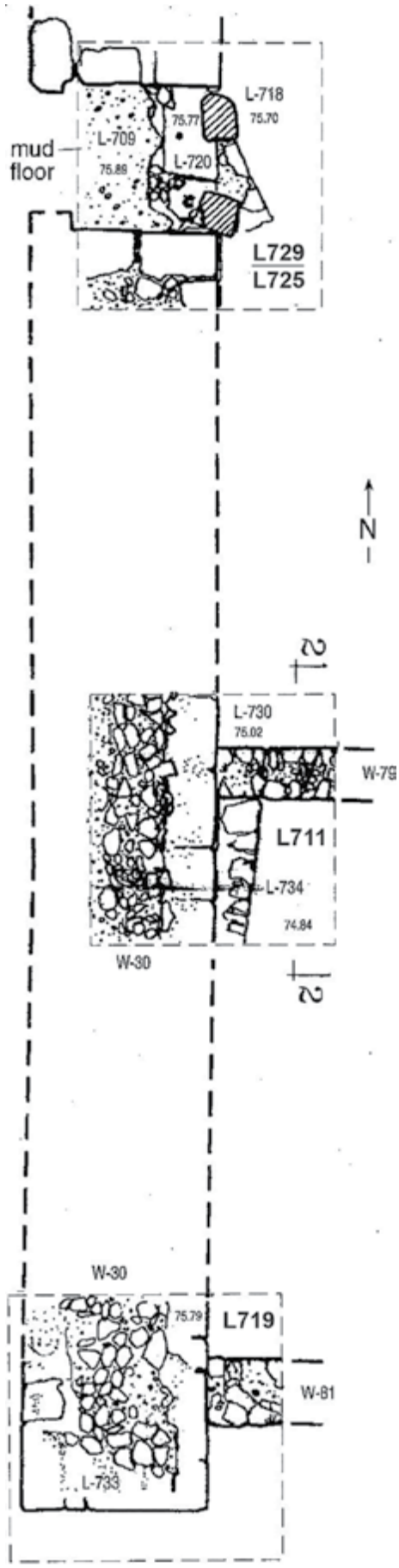

W79=W21
L216#
W81=W22
L923
L907
# L908 Oven
W30
L104
L919#
Basalt Platform
curtain wall
1st room in vaulted Gallery
the large pier
L911 #
W-80
Main Gate
L-863
L-873
W-81
L251
L252 #
Area E and E1
10m.


Area G
0
3m.
L223
L222
L226
W30
W29
W22
L207
L220
L232
L202
L213
W26
L210
L230
W-25
Fortress Wall


Area H
Fortress Wall
Fortress Wall
L406
W40
L401
0
3m.


H
A
F
Mosque
reservoir
25m.

Area **K**


L-718
75.70
75.77
L-709
mud
floor
75.88
L-720
L729
L725
N
12
L-730
75.02
W-79
L711
L-734
74.84
W-30
12
W-30
75.79
L719
W-81
L-733

# BIBLIOGRAPHY

## Abbreviations

| | |
|---|---|
| ADAJ | Annual of the Department of Antiquities Jordan. |
| BASOR | Bulletin of the American School of Oriental Research. |
| BCH | Bulletin de Correspondance Hellènique. |
| BMMA | Bulletin of the Metropolitan Museum of Art. |
| DAFI | Dèlègation Archèologique Francaise en Iran. |
| *ESI* | Excavations and Surveys in Israel |
| *IEJ* | Israel Exploration Journal. |
| *JNES* | Journal of Near Eastern Studies |
| QDAP | Quarterly of the Department of Antiquities of Palestine |

## Primary Sources


Abu l'-Fida', *'Al-mukhtasar ta'rikh al-bashar*. *Recueil des Historiens des Croisades. Historiens Orientaux*, (Paris, 1844–1895), vol. 1.

Abū Shāma, Shihāb al-Dīn ʿAbd al-Raḥmīn b. Ismāʿīl, *Kitāb al-Rawḍatayn fī Akhbār al-Dawlatayn* (Beirut, 1997), vol. 3.

Albert of Aachen, *Historia Ierosolimitana*. Ed. and tran. S. B. Edgington (Oxford, 2007).

Bar *Hebraeus (Abu l-Faraj), Chronography.* Tran. E.A.W. Budge (London, Oxford 1932), vol. I.

Fulcher of Chartres, *Historia Hierosolymitana (1095–1127)*. Ed. H. Hagenmeyer (Heidelberg, 1913).

Hethum, Count of Gor'igos, 'Table chronologique,' *Recueil des Historiens des Croisades. Documents Armeniens*, vol. 1.

Ibn al-Athir, *Extrait de la chronique intitulée Kamel-altevarykh, par Ibn-Alatyr;* In Recueil des Historiens des Croisades. Académie des Inscriptions et Belles-Lettres, Historiens orientaux (Paris, 1872–1906), vol 4.

Ibn al-Athīr, ʿIzz al-Dīn ʿAlī, *al-Kāmil fī'l-ta'rīkh*. Ed. C. J. Tornberg (Beirut, 1966), vol. 11–12.

Ibn al-Athīr, ʿIzz al-Dīn ʿAlī, *al-Kāmil fī'l-ta'rīkh.* Ed. C. J. Tornberg (Beirut, 1987), vols. 10–19.

Ibn al-Athīr, *The Chronicle of Ibn al-Athīr for the Crusading Period from Al-Kāmil fi'l-Ta'rīkh.* Tran. D. S. Richards (London, 2007).

Ibn al-Qalānisī, *The Damascus Chronicle of the Crusades, extracted and translated from the Chronicle of Ibn al-Qalānisī.* Ttran. H.A.R. Gibb (London, 1932).

Ibn al-Qalānisī, *Ta'rīkh Demashq* (Damascus, 1983).

Ibn Wāṣil, Jamāl al-Dīn Muḥammad b. Sālim. *Mufarrij al-kurūb fī akhbār banī ayyūb*. G. al-Dīn al-Shayyal (ed.) (Alexandira, 1953), vol. 2.

Ibn Shaddad, *The Rare and Excellent History of Saladin*. Ed. and tran. D. S. Richards (Aldershot, 2001).

ʿImād al-Dīn al-Isfahānī. *Sana l-Barqu al-shami* (Riyadh, 1989).

al-Maqrīzī, Taqī al-Dīn Aḥmad b. ʿAlī. *Kitāb al-Sulūk li-Maʿrifat Duwal al-Mulūk*. Eds. M. M. Ziyāda and S.ʿA-F. Āshūr (Cairo, 1934–1973), vol. 1, part 1.

al-Maqrīzī, *Kitāb al-Sulūk li-Ma'rifat Duwal al-Mulūk* (Beirut, 1997), vol. 1, part 1.

Ralph of Coggeshale, *Chronicon Aanglicanum.* Ed. J. Stevenson Rolls Series (London, 1875).

Robert of Auxerre, *Chronicon. Monumenta Germaniae Historica. Scriptores*, vol. 26.

Röhricht, R., *Geschichte des Königsreichs Jerusalem (1100–1291).* (Innsbruck, 1898).

Taybughā l-Ashrafī l–Yūnanī, *Toiler Kitab Ghunyat at-tullab fi ma'rifat ramy an-nushab (Essential Archery for the Fighting Archer) Saracen Archery*: *an English Version and Exposition of a Mameluke Work on Archery (ca. A.D. 1368).* Eds. and trans. J. D. Latham and W. F. Paterson (London, 1979).

The Anonymous Author, De constructione castri Saphet. In *The Templars: Selected Sources Translated and Annotated by M. Barber and K. Bate* (Manchester, 2002).

Unknown Author, *Arab Archery: An Arabic Manuscript of about A.D. 1500*: *A Book on the Excellence of the Bow and Arrow.* Trans. and eds. N. A. Faris and R. P. Elmer (Princeton, 1954).

Vitruvius, *The Ten Books on Architecture.* Ttran. M. H. Morgan (Cambridge, Mass. and London, 1926): 49–50.

Walter the Chancellor, *The Antiochene Wars*. Ed. H. Hagen Meyer, Trans. T. S. Asbridge and S. B. Edgington (Aldershot, 1999).

William of Nangis, *Chronicon. Bouquet, Recueil des Historiens des Gaules et de la France*, vol. 20.

William Archbishop of Tyre, *The Deeds Done Beyond the Sea*. Trans. E. A. Babcock and A. C. Krey (New York, 1976), vol. 2.

William-of-Tyre, Willelmi Tyrensis Archiepiscopi Chronicon. *Corpus Christianorum Continuatio Mediaevalis*: 63–63a. Ed. R.B.C. Huygens (Turnhout, 1986).

## Primary Sources World War I (Chapter 9)

AWM4 10/3/44, War diary of the 3rd Australian Light Horse Brigade, September 1918. https://www.awm.gov.au/collection/C1351379

AWM4 10/4/21, War diary of the 4th Australian Light Horse Brigade, September 1918 https://www.awm.gov.au/collection/C1351880

AWM4 10/9/45, War diary of the 4th Australian Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1355149

AWM4 10/5/2, War diary of the 5th Australian Light Horse Brigade, September 1918 https://www.awm.gov.au/collection/C1351999

AWM4 10/13/39, War diary of the 8th Light Horse Regiment, September 1918 https://www.awm.gov.au/collection/C1351913

AWM4 10/14/43, War diary of the 9th Light Horse Regiment, September 1918. https://www.awm.gov.au/collection/C1351613

AWM4 10/15/39, War diary of the 10th Light Horse Regiment, September 1918. https://www.awm.gov.au/collection/C1352128

AWM4 10/17/18, War diary of the 12th Australian Light Horse Regiment, September 1918. https://www.awm.gov.au/collection/C1355129

AWM4 10/19/2, War diary of the 14th Australian Light Horse Regiment, September 1918. https://www.awm.gov.au/collection/C1351645

AWM4 10/5/2, War diary of the 15th Australian Light Horse Regiment, September 1918. https://www.awm.gov.au/collection/C1351656

AWM28 2/145, Honours and Awards (Recommendation), Henry MacLachlan Macnee. https://www.awm.gov.au/collection/C1380240

## Modern Studies

Abdelkawy Sheir, A.M.M. The Military Role of the Fief of Tibnīn against the Muslims in the Age of the Crusades (AH 498–583/AD 1105–1187). *Journal of Religious Culture* 188 (2014): 1–18.

Abulafia, D. *The Two Italies, Economic Relations between the Roman Kingdom of Sicily and the Northern Communes* (Cambridge, 1977).

Acland, J. H. *Medieval Structure: The Gothic Vault* (Toronto, 1972).

Agnon, A. Pre-Instrumental Earthquakes Along the Dead Sea Rift. In Z. Garfunkel, Z. Ben-Avraham and E. Kagan (eds.) *Dead Sea Transform Fault System: Reviews* (Dordrecht, 2014): 207–261.

Amar, Z. *Foodstuffs and Industrial Products Grown in the Land of Israel during the Middle Ages* (Jerusalem, 1996).

Amar, Z. *Agricultural Production in the Land of Israel during the Middle Ages* (Jerusalem, 2000).

Ambraseys, N. N. The 12th Century Seismic Paroxysm in the Middle East: A Historical Perspective. *Annals of Geophysics*, 47/2 (April 2004): 1–26.

Ambraseys, N.N. and Barazangi, M. The 1759 earthquake in the Bekaa Valley: Implications for earthquake hazard assessment in the eastern Mediterranean region. *Journal of Geophysical Research* 94 (1989): 4007–4013.

Ambraseys, N.N. and Melville, C. P. An Analysis of the Eastern Mediterranean Earthquake of 20 May 1202. In W. K.H. Lee, H. Meyers and K. Shimazaki (eds.) *Historical Seismograms and Earthquakes of the World* (San Diego, 1988): 181–200.

Amiran, D.H.K. Location Index for Earthquakes in Israel since 100 B.C.E. *IEJ* 46/1–2 (1996): 120–130.

Amiran, D.H.K. Arieh, E. and Turcotte, T. Earthquakes in Israel and Adjacent Areas: Macroseismic Observations since 100 B.C.E. *IEJ* 44/3–4 (1994): 260–305.

Amitai, R. Notes on the Ayyubid Inscriptions at Al-Ṣubayba (Qalʿat Nimrod). *Dumbarton Oaks Papers* 43 (1989): 113–119.

Amitai, R. An Arabic Inscription at al-Ṣubayba (Qalʿat Namrud) from the Reign of Sultan Baybars. In M. Hartal *The Al-Ṣubayba (Nimrod) Fortress, Towers 11 and 9*. IAA Reports 11 (Jerusalem, 2001): 109–123.

Amitai, R. *Mongols and Mamluks. The Mamluk-Ilkhanid War, 1260–1281* (Cambridge, 2004).

Amitai, R. The Conquest of Arsuf by Baybars: Political and Military Aspects. *Mamluk Studies Review* IX/1 (2005): 61–84.

Amitai-Preiss, R. *Mongols and Mamluks: The Mamluk-Ilkhanid War 1260–1281* (Cambridge, 1995).

Andrews, P. *Owls, Caves and Fossils*. British Museum of Natural History (Chicago, 1990).

Armijo, R., Meyer, B., Hubert, A. and Barka. A. Westward Propagation of the North Anatolian Fault into the Northern Aegean: Timing and Kinematics. *Geology* 27/3 (March 1999): 267–270.

Armitage, P. L. Small Mammal Faunas in Later Medieval Towns: a Preliminary Study in British Urban Biogeography. *Biologist* 32/2 (1985): 65–71.

Armstrong, P. A Group of Byzantine Bowls from Skopelos. *Oxford Journal of Archaeology* 10 (1991): 335–347.

Armstrong, P. Zeuxippus Derivative Bowls from Sparta. In J. M. Sanders (ed.) *Lakonian Studies in Honor of Hector Catling* (Oxford, 1992): 1–9.

Arnon, Y. D. The Islamic and Crusader Pottery of Area I 1993–1994: A Stratigraphical/Typological Study. In K. G. Holum, A. Raban and J. Patrich (eds.) *Caesarea Papers* II (Journal of Roman Archaeology Supplementary series, 1999): 225–251.

Arnon, Y. D. *Caesarea Maritima, the Late Periods (700–1291*). BAR International Series 1771 (Oxford, 2008a).

Arnon, Y. D. The Ceramic Oil Lamps of the Transitional and Medieval Period from Caesarea Maritima (640–1300 CE): A Chronological and Typological Study. In K. G. Holum, J. A. Stabler and E. G. Reinhardt (eds.) *Caesarea Reports and Studies.* BAR International Series 1784 (Oxford, 2008b): 213–269.

Arnon, Y. D., Laster, A. and Pollak, R. The Fatimid Hoard from Caesarea: A Preliminary Report. In K. G. Holum, J. A. Stabler and E. G. Reinhardt (eds.) *Caesarea Reports and Studies*. BAR International Series 1784 (Oxford, 2008c): 105–114.

Asbridge, T. *The Crusades* (London, 2010).

Ashbee, P. Hook, Warsash, Hampshire Excavations, 1954. *Hampshire Field Club and Archaeological Society* 43 (1987): 21–62.

Ashtor, E. The Venetian Cotton Trade in Syria in the Later Middle Ages. *Studi Medievali* 17 (1976): 675–715.

Ashtor, E. *A Social and Economic History of the Near East in the Middle Ages* (London, 1976).

Ashtor, E. The Crusader Kingdom and the Levant Trade. In B. Z. Kedar (ed.) *The Crusaders in Their Kingdom 1099–1291* (Jerusalem, 1988): 30–55.

Atil, A. *Ceramic from the World of Islam*. Smithsonian Institute (Washington, 1973).

Avitzur, S. *Man and His Work: Historical Atlas of Tools and Workshops in the Land of* (Jerusalem, 1976 (Hebrew).

Avissar, M. The Medieval Pottery. In A. Ben Tor, M. Avissar and Y. Portugali (eds.). *Yoqne'am* I, *the Late Periods*. Qedem Reports 3 (Jerusalem, 1996): 75–262.

Avissar, M. and Stern, E. J. *Pottery of the Crusader, Ayyubid and Mamluk Periods in Israel*. IAA Reports 26 (Jerusalem, 2005).

Ayalon, D. *Gunpowder and Firearms in the Mamluk Kingdom*, 2nd ed. (London, 1978).

Ayalon, D. and Shinar, P. *Arabic-Hebrew Dictionary of Modern Arabic* (Jerusalem, 1991).

Ayalon, E. Typology and Chronology of Water Wheel (Sāqiya) Pots from Israel. *IEJ* 50 (2000): 216–226.

Ayalon, E. *The Assemblage of Bone and Ivory Artifacts from Caesarea Maritima, Israel 1st-13th Centuries CE*. BAR International Series 1457 (Oxford, 2005).

Bachrach, B. S. Medieval Siege Warfare: A Reconnaissance. *The Journal of Military History* Vol. 58/1 (1994): 119–133.

Bachrach, B.S. and Aris, R. Military Technology and Garrison Organization: Some Observations on Anglo-Saxon Military Thinking in Light of the Burghal Hidage. *Technology and Culture* 31/1 (January 1990): 1–17.

Bagatti, B. *I Monumenti di Emmaus al–Qubeibeh e dei Dintorni* (Jerusalem, 1947).

Bagatti, B. The Coins at Emmaus-el-Qubeibeh: More Evidence. *Holy Land* (1987): 8–13.

Baker, J. R. The study of animal diseases with regard to agricultural practices and man's attitude to his animals. In C. Grigson and J. Clutton-Brock (eds.) *Husbandry in Europe*. BAR International Series 227 (Oxford, 1984): 253–257.

Baker, J. and Brothwell, D. *Animal Diseases in Archaeology* (London, 1980).

Balog, P. *The Coinage of the Mamlûk Sultans of Egypt and Syria.* Numismatic Studies 12 (New York, 1964).

Balog, P. *The Coinage of the Mamlûk Sultans*: Additions and Corrections. *Museum Notes* 16 (1970): 113–171.

Balog, P. *The Coinage of the Ayyûbids*. Royal Numismatic Society Special Publications 12 (London, 1980).

Balog, P. and Yvon, J. Monnaies á legendes Arabes de l'Orient latin. *Revue Numismatique*, 6.1 serie (1958): 133–168.

Baramki, D. C. The Pottery from Kh. el Mafjar. *QADP* X/2–3 (1944): 65–105.

Barbé, H. *Le château de Safed et son territoire a l'époque des Croisades*. PhD Dissertation. The Hebrew University of Jerusalem (2010).

Barbé, H. and Cinamon, G. Zefat Final Report. *Hadashot Arkheologiyot* 121 (2009) Internet version.

Barbé, H. and Damat, E. Le château de Safed: sources historiques, problématique et premiers résultats des recherches. In N. Faucherre, J. Mesqui and N. Prouteau (eds.) *La fortification au temps des croisades. Actes du colloque de Parthenay* (Rennes, 2004): 77–93.

Barber, M. Frontier Warfare in the Latin Kingdom of Jerusalem: The Campaign of Jacob's Ford, 1178–1179. In J. France and W. G. Zajac (eds.) *The Crusades and their Sources*: *Essays Presented to Bernard Hamilton* (Singapore and Sydney, 1989): 9–22.

Barber, M. Supplying the Crusader States: The Role of the Templars. In B. Z. Kedar (ed.) *The Horns of Hattin* (Jerusalem, 1992): 314–326.

Barber, M. The Knights Templars. *Historian* 60 (Winter 1998): 1–6.

Barka, A. Slip Distribution along the North Anatolian Fault Associated with the Large Earthquakes of the Period 1939 to. *Bulletin of the Seismological Society of America* 86/5 (October 1996): 1238–1254.

Barnes, E. The Dead Do Tell Tales. In C. K. Williams and N. Bookidis (eds.) *Corinth: The Centenary, 1896–1996* (Princeton, American School of Classical Studies at Athens, 2003): 435–443.

Bar-Oz, G., Bouchnik, R., Weiss, E., Weissbrod, L., Bar-Yosef Mayer, D.E. and Reich, R. "Holy Garbage": A Quantitative Study of the City-Dump of Early Roman Jerusalem. *Levant* 39/1 (2007): 1–12.

Bartov, T. When I Play, the Eagle Sings. *Masa Acher* (2009). https://www.masa.co.il/article/-כשאני מנגן-הנשר-שר

Bass, W. M. *Human Osteology. A Laboratory and Field Manual.* 5th Edition. (Columbia: Missouri Archaeological Society, 2005).

Battista, A. and Bagatti, B. *La Fortezza saracena del Monte Tabor (AH. 609–15: AD. 1212–18)*. (Jerusalem, 1976).

Bealer, A. W. *The Art of Blacksmithing* (New Jersey, 1995).

Belmaker, M. Using comparative micromammal taphonomy to test palaeoecological hypotheses: 'Ubeidiya, a Lower Pleistocene site in the Jordan Valley, Israel, as a case study. *Biosphere to Lithosphere: new studies in vertebrate taphonomy* (2005): 110–125.

Belmaker, M., Nadel, D. and Tchernov, E. Micromammal Taphonomy in the Site of Ohalo II (19 Ky., Jordan Valley). *Archaeofauna* 10 (2001). Retrieved from https://revistas.uam.es/archaeofauna/article/viewFile/8462/8831.

Belmaker, M., Bar-Yosef, O., Belfer-Cohen, A., Meshveliani, T. and Jakeli, N. The Environment in the Caucasus in the Upper Paleolithic (Late Pleistocene): evidence from the small mammals from Dzudzuana cave, Georgia. *Quaternary International* 425 (2016): 4–15. DOI:10.1016/j.quaint.2016.06.022.

Ben Arieh, R. The Roman, Byzantine and Umayyad Pottery. In Y. Hirschfeld (ed.) *The Roman Bath of Hammat Gader, Final Report* (Jerusalem, 1997): 347–381.

Ben-Artzi, Y. Unrealized Development Plans for Haifa at the End of the 19th Century. *Cathedra* 73 (1994): 62–82 (Hebrew).

Ben-Dov, M. *The Dig at the Temple Mount* (Jerusalem, 1982).

Ben-Hurin, A. The Mamluk and Ottoman period maps 13/IX. In *Atlas Israel* (Tel Aviv, 1956).

Ben-Menahem, A., Nur, A. and Vered, M. Tectonics, seismicity and structure of the Afro-Eurasian junction — The breaking of an incoherent plate. *Physics of the Earth and Planetary Interiors* 12 (1976): 1–50.

Ben Tor, A. Excavations at Horvat 'Usa. *Atiqot* 3 (1963):1–24 (Hebrew).

Benvenisti, M. *The Crusaders in the Holy Land* (Jerusalem, 1976).

Berman, A. The Numismatic Finds from the Citadel. *Hadashot Arkheologiyot* 103 (1993): 38–42 (Hebrew).

Berman, A. The Numismatic Finds from the Beth She'an Citadel. *Hadashot Arkheologiyot* 105 (1995): 41–42 (Hebrew).

Bijovsky, G. Coins. In Y. Hirschfeld Excavations *at Tiberias, 1989–1994*. IAA Reports 22 (Jerusalem, 2004): 169–175.

Biller, T., Burger, D., Großmann, U.G., Häffner, H.H., Radt, T. and Schmitt, R. Nochmals zum Crac des Chevaliers — Anmerkungen zum Forschungsstand. Originalveröffentlichung. In M. Goer *Die Pfalz Wimpfen und der Burgenbau in Südwestdeutschland* (Forschungen zu Burgen und Schlössern 15) (Petersberg, 2013): 239–250.

Boas, A. J. The Import of Western Ceramics to the Latin Kingdom of Jerusalem. *IEJ* 44 (1994):102–122.

Boas, A. J. Medieval and Post Medieval Finds. In Y. Hirschfeld (ed.) *Ramat Hanadiv Excavations* (Jerusalem, 1996): 211–226.

Boas, A. J. Late Ceramic Typology. in: Hirschfeld Y. (ed). *The Roman Bath of Hammat Gader, Final Report* (Jerusalem 1997): 382–395.

Boas, A. J. *Crusader Archaeology — The Material Culture of the Latin East* (London and New York, 1999).

Boas, A. J. Pottery and Small Finds from the Late Ottoman Village and the Early Zionist Settlement. In Y. Hirschfeld *Ramat Hanadiv Excavations*: *Final Report of the 1984–1998 Seasons* (Jerusalem 2000): 547–580.

Boas, A. J. *Jerusalem in the Time of the Crusades*: *Society, Landscape and Art in the Holy City under Frankish Rule* (London, 2001).

Boas, A. J. *Archaeology of the Military Orders* (London and New York, 2006).

Boas, A. J. *Domestic Settings: Sources on Domestic Architecture and Day-to-Day Activities in the Crusader States* (Leiden and Boston, 2010).

Boas, A. J. Archaeological evidence for the siege of 1271. In A. J. Boas, and R. G. Khamisy (eds.) *Montfort* (Leiden and Boston, 2017): 49–55.

Bökönyi, S. Appendix A. Once More on the Osteological Differences of the Horse, the Half-ass and the Ass. In L. Firouz (ed.) *The Caspian Miniature Horse in Iran*. Miami: Field Research Projects 64 (1972): 12–23.

Borsch, S. J. *The Black Death in Egypt and England* (Austin, Texas, 2005).

Boylston, A. Evidence for Weapon-Related Trauma in British Archaeological Samples. In M. Cox and S. Mays (eds.) *Human Osteology in Archaeology and Forensic Science* (London, Greenwich Medical Media, 2000): 357–380.

Bradbury, J. *The Medieval Siege* (Woodbridge, U.K., 1992).

Bradbury, J. *The Medieval Archer* (Bury St. Edmunds, Suffolk, 1998).

Brauer, R. W. Boundaries and Frontiers in Medieval Muslim Geography. *Transactions of the American Philosophical Society.* New Series 85/6 (1995): 1–73.

Brockelmann, C. and Cahen, Cl. "al-Ḳāḍī al-Fāḍil." In P. Bearman, Th. Bianquis, C. E. Bosworth, E. van Donzel and W. P. Heinrichs (eds.) *Encyclopaedia of Islam, Second Edition*. Consulted online http://dx.doi.org/10.1163/1573–3912_islam_SIM_3757.

Broneer, O. Terracotta Lamps. In *Corinth* IV (Cambridge, American School of Classical Studies at Athens, 1930).

Brosh, N. Ceramic Remains, Pottery of the 8th-13th Centuries (Strata 1–3). In I. L. Levine and E. Netzer (eds.) *Excavations in Caesarea Maritima, 1975, 1076, 1978, Final Report.* Qedem 21 (Jerusalem, 1986): 66–89.

Bronstein, J. Food and the Military Orders: Attitudes of the Hospital and the Temple between the Twelfth and Fourteenth Centuries. *Crusades* 12 (2013):133–153.

Bronstein, Y. The Hospitallers and the Templars, Food and Refractories in the Twelfth –Fourteenth Centuries. In I. Ziffer and O. Tal (eds.) *Last Supper in Apollonia* (Tel Aviv, 2011): 62–68 (Hebrew).

Brown, R. M. Ceramics from the Kerak Plateau. In J. M. Miller (ed.) *Archaeological Survey of the Kerak Plateau* (Atlanta, 1991): 169–279.

Buck, A. D. The Castle and Lordship of Ḥārim and the Frankish-Muslim Frontier of Northern Syria in the Twelfth Century. *Al-Masāq — Journal of the Medieval Mediterranean* 28/2 (2016): 113–131.

Burgtorf, J. *The Central Convent of Hospitallers and Templars* (Leiden and Boston, 2008).

Caiger-Smith, A. *Lustre Pottery* (London, 1985).

Campbell, J.P. *A view of Yakub, from the enemy side of the Jordan River* (AWM B00298, 1918) https://www.awm.gov.au/collection/C451637

Cartlege, J. Faunal Remains. In D. Pringle (ed.) *The Red Tower (al-Burj al-Ahmar)*. British School of Archaeology in Jerusalem (London, 1986): 176–186.

Cervello, M. V. From the Disappearance of 'tribe' to the Reawakening of Tribal Feelings: Strategies of State among the Formerly Bidan (Arabophone) of Mauritania. In D. Chatty (ed.) *Nomadic Societies in the Middle East and North Africa Entering the 21st century* (Leiden and Boston, 2006): 144–175.

Chaline, J. Rodents, Evolution and Prehistory. *Endeavor* 1 (1977): 44–51.

Chamberlain, M. *Knowledge and Social Practice in Medieval Damascus, 1190–1350* (Cambridge, 1994).

Chay, J. and Ross, T. E. (eds.) *Buffer States in World Politics* (Boulder and London, 1986).

Chevedden, P. E. Fortifications and the Development of Defensive Planning during the Crusader Period. In D. J. Kagay and L.J.A. Villalon (eds.) *The Circle of War in the Middle Ages* (Woodbridge, U.K.,1999): 34–43.

Clutton-Brock, J. *Horse Power*. Natural History Museum Publications (Oxford, 1992).

Clutton-Brock, J. and Burleigh, R. Notes on the osteology of the Arab horse with reference to a skeleton collected in Egypt by Sir Flinders Petrie. *Bulletin British Museum Natural History (Zoology)* 35/2 (1979): 127–200.

Cohen Uzzielli, T. The Oil Lamps. In Y. Hirschfeld (ed.) *The Roman Bath of Hammat Gader Final Report* (Jerusalem, 1997): 319–345.

Colardelle, R. and Colardelle, M. L'habitat médiéval immergé de Colletière, à Charavines (Isère). Premier bilan des fouilles. *Archéologie Médiévale* 10 (1980): 167–269.

Conder, C. R. and Kitchener, H. H. *The Survey of Western Palestine: Memoirs of the Topography, Orography, Hydrography and Archaeology* (London, 1881), vol. 1 Galilee

Cox, D. H. *The Tripolis Hoard of French Seignoral and Crusader Coins*. Numismatic Notes and Monographs 59 (New York, 1933).

Croft, P. The Faunal Remains. In R. P. Harper and D. Pringle (eds.) *Belmont Castle* (Oxford, 2000): 173–194.

Crusafont i Sabater, M., Labrot, J. and Moll i Mercadal, B. *Plomos y Jetones Medievales de la Peninsula Iberica* (Barcelona and Madrid, 1996).

Cuenca-Bescós, G., Straus, L.G., Morales, M.R.G., and Pimienta, J.C.G. The reconstruction of past environments through small mammals: from the Mousterian to the Bronze Age in El Mir'on Cave (Cantabria, Spain). *Journal of Archaeological Science*, 36/4 (2009): 947–955.

Cuenca-Bescós, G., Melero-Rubio, M., Rofes, J., Martínez, I., Arsuaga, J. L., Blain, H.-A. and de Castro, J.M.B. The Early–Middle Pleistocene environmental and climatic change and the human expansion in Western Europe: A case study with small vertebrates (Gran Dolina, Atapuerca, Spain). *Journal of Human Evolution*, 60/4 (2011): 481–491. Retrieved from http://eprints.ucm.es/26878/1/1-s2.0-S0047248410000655

Cunha, E. and Silva, A. M. War Lesions from the Famous Portuguese Medieval Battle of Aljubarrota. *International Journal of Osteoarchaeology* 7 (1997): 595–599.

Cupere, B. D. Animals at Ancient Sagalassos: Evidence of the Faunal Remains. In M. Waelkens (ed.) *Studies in Eastern Mediterranean Archaeology* IV (Turnhout: Brepols, 2001): 66–91.

Cytryn-Silverman, K. *The Road Inns (khāns) in Bilād al-Shām* (Oxford, 2010).

De Cupere, B., Thys, S., Van Neer, W., Ervynck, A., Corremans, M. and Waelkens, M. Eagle owl (*Bubo bubo*) pellets from Roman Sagalassos (SW Turkey): distinguishing the prey remains from nest and roost sites. *International Journal of Osteoarchaeology*, 19/1 (2009): 1–22.

Daëron, M., Klinger, Y., Tapponnier, P., Elias, A., Jacques, E. and Sursock, A. Sources of the large A.D. 1202 and 1759 Near East earthquakes. *Geology* 33 (July, 2005): 529–532.

Dahman, Muhammad Ahmad. Zilzal sanat 1173, Al-Mashriq. *Beirut* 42 (1948): 332–347.

Dalali-Amos and Getzov, N. Safed, Remains from the Mamluk period in the al-Waṭṭa Quarter, Safed (Ẓefat), *'Atiqot* 97 (2019): 271–275. (Hebrew)

Davis, R.H.C. *The Medieval Warhorse*: *Origin, Development and Redevelopment* (London, 1989).

Davis, S. J. Late Pleistocene and Holocene Equid Remains from Israel. *Zoological Journal of the Linnean Society* 70 (1980): 289–312.

Davis, S.J.M. *The Archaeology of Animals* (New Haven and London, 1987).

Dekel, A. The Ottoman Clay Pipes. In V. Tzaferis and S. Israeli (eds.) *Paneas* II. IAA Reports 38 (Jerusalem, 2008): 113–164.

Delaville Le Roux, J. (ed.) *Cartulaire général de l'Ordre des Hospitaliers de St. Jean de Jérusalem (1100–1310)* (Paris, 1894–1906), 4 vols.

Deschamps, P. Les Entrées des Chateâux des Croisés en Syrie et leurs defense. *Syria* 13 (1932): 369–387.

Deschamps, P. *Les Chateâux des Croisés en Terre Sainte I.: Le Crac des Chevaliers*. Album (Paris, 1934).

Deschamps, P. *Les Chateâux des Croisés en Terre Sainte I.: Le Crac des Chevaliers* (Paris, 1939), 2 vols.

Dolinka, B. J. Ayyubid and Mamluk Pottery from a Crusader-Period Subterranean Reservoir at Moẓa. *Atiqot* 91 (2018):193–204.

Dols, M. W. *The Black Death in the Middle East*. (Princeton, New Jersey, 1977).

Dols, M. W. The Second Plague Pandemic and its Recurrences in the Middle East 1347–1894. *Journal of the Economic and Social History of the Orient* 222 (1979): 162–189.

Driesch, A., von den and Boessneck, J. Kritische Anmerkungen zur Widerristhöhenberechnung aus Lāngenmassen vor-und frühgeschichtlicher Tierknochen. *Säugetierkundliche Mitteilungen* 22 (1974): 325–348.

Driesch, A., von den and Peters, J. Frühe pferde- und maultierskelette aus Auaris (Tell El-Dabᶜa), östliches Nildelta. Ägypten und Levante XI (2001): 301–311.

Drori, Y. Eretz Israel in the Mamluk State (1260–1516). In A. Cohen *The History of Eretz Israel under the Mamluk and Ottoman Rule (1260–1804)* (Jerusalem, 1990).

Edbury, P. The Baronial Coinage of the Latin Kingdom of Jerusalem. In P. W. Edbury and D. M. Metcalf (eds.) *Coinage of the Latin East* (Oxford, 1980): 59–72.

Eddé, A.-M. *Saladin.* J. M. Todd (trans.) (Cambridge and London, 2011).

Edelstein, G. and Avissar, M. A Sounding in Old Acre. ʻ*Atiqot* 31 (1997):129–136.

Edge, D. and Paddock, J. M. *Arms and Armor of the Medieval Knight* (London, 1996).

Edwards, A.O. *303 inch British Service Ammunition* (Canterbury, Kent, 2011).

Ehrenkreutz, A. S. *Saladin* (New York, 1972).

Eisenberg, E. and Ovadiah, R. A Byzantine Monastery at Mevo Modi'im. *Atiqot* 36 (1998): 1*–19* (Hebrew, English summary 123–124).

Eisenmann, V. Les chevaux (*Equus sensu lato*) fossils et actuels: cranes et dents jugales supérieures. *Editions du Centre National de la Recherche Scientifique* (Paris, 1980).

Eisenmann, V. Comparative Osteology of Modern and Fossil Horses, Half-asses, and Asses. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden, 1986): 67–116.

Eisenmann, V. and Beckouche, S. Identification and Discrimination of Metapodials from Pleistocene and Modern *Equus*, Wild and Domestic. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden, 1986): 117–163.

Eisenmann, V., Alberdi, M.T., De Giuli, C. and Staesche, U. Methodology. In M. Woodburne and P. Sondaar (eds.) *Studying Fossil Horses* Vol. 1 (Leiden, 1988), vol.1:1–71.

Ellenblum, R. Who built Qalat al-Subayba? *Dumbarton Oaks Papers* 43 (1989):103–112.

Ellenblum, R. Construction Methods in Frankish Rural Settlements. In B. Z. Kedar (ed.) *The Horns of Hattin* (Jerusalem, 1992): 168–192.

Ellenblum, R. Frankish Castles in The Crusader Kingdom of Jerusalem, the Third Generation. In M. Balard (ed.) *Le Concile de Clermont et la Prémiere Croisade* (Paris, 1996): 518–551.

Ellenblum, R. *Frankish Rural Settlement in the Latin Kingdom of Jerusalem* (Cambridge, 1998).

Ellenblum, R. Frontier Activities: the Transformation of a Muslim Sacred Site into the Frankish Castle of Vadum Iacob. *Crusades* 2 (2003): 83–98.

Ellenblum, R. *Crusader Castles and Modern Histories* (Cambridge, 2007).

Ellenblum, R. and Boas, A. Mezad Ateret. *ESI* 109 (1999): 5–6.

Ellenblum, R., Marco, S., Agnon, A., Rockwell, T. and Boas, A. Crusader castle torn apart by earthquake at dawn, 20 May 1202. *Geology* 26/4 (1998): 303–306.

Ellenblum, R. Marco, S., Kool, R., Davidovitch, U., Porat, R. and Agnon, A. Archaeological Record of Earthquake Ruptures in Tell Ateret, the Dead Sea Fault. *Tectonics* 34/10 (2015): 2105–2117.

Epstein, H. Ass, mule and onager. In I. L. Mason (ed.) *Evolution of domesticated animals* (London, 1984): 174–184.

Ettinghausen, R. The Uses of Sphero-Conical Vessels in Muslin East. *JNES* 24/3 (1965): 218–229.

Falls, C. *Armageddon: 1918* (Annapolis, 1979).

Fehervari, G. *The Islamic Pottery, Barlow Collection* (London, 1973).

Fiorato, V., Boylston, A. and Knüsel, C. (eds.) *Blood Red Roses: The Archaeology of a Mass Grave from the Battle of Towton, AD 1461* (Oxford, 2000).

Forey, A. *The Military Orders* (Toronto and Buffalo, 1992).

France, J. Technology and the Success of the First Crusade. In Y. Lev (ed.) *War and Society in the Eastern Mediterranean, 7th-15th Centuries* (Leiden, 1997): 163–176.

Francesco Quaresmio, *Historica, Theologica et Moralis Elucidatio Terrae Sanctae* (Antwerp, 1639), vol. 2.

Frenkel, Y. Rural Society in Mamluk Palestine. *Cathedra* 77 (1995): 17–38.

Frenkel, Y. Villages, the Religious Establishment and the Mamluk Military Aristocracy: Notes on the History of Migration and Land Tenure in Mamluk Bilad al-Sham. *Cathedra* 173 (2019): 37–58.

Freund, R., Zak, I. and Garfunkel, Z. Age and Rate of the Sinistral Movement along the Dead Sea Rift. *Nature* 220 (1968): 253–255.

Fried, T., Weissbrod, L., Tepper, Y. and Bar-Oz, G. A glimpse of an ancient agricultural ecosystem based on remains of micromammals in the Byzantine Negev Desert. *Royal Society Open Science* 5/1 (2018): 171528. doi:10.1098/rsos.171528.

Friedman, Y. Violence toward Captives in the Latin East. *Historia: Journal of the Historical Society of Israel* 11 (2003): 21–46.

Friedman, Y. Peacemaking: Perceptions and Practices in the Medieval Latin East. *Crusades* (2010): 229–257.

Frierman, J.D., Asaro, F. and Michel, H. V. The Provenance of Early Islamic Lustre Wares. *Ars Orientalis* 11 (1978): 111–126.

Fugedi, E. *Castles and Society in Medieval Hungary (1000–1437)* (Budapest, 1986).

Fulton, M. S. *Siege Warfare during the Crusades* (Yorkshire and Philadelphia, 2019).

Gabrieli, R.S, Ben-Shlomo, D. and Walker, B. J. Production and Distribution of Geometrical-Painted (HMGP) and Plain Hand-Made Wares of the Mamluk Period: A Case Study from Northern Israel, Jerusalem and Tall Hisban. *Journal of Islamic Archaeology* 1/2 (2014):193–229.

Gavish, D. Air-Photographs by First World War Pilots in Eretz–Israel. *Cathedra* (April 1978): 118–150 (Hebrew).

Gibb, H.A.R. The Arabic Sources for the Life of Saladin. *Speculum* XXV (1950): 58–72.

Gibb, H.A.R. *al-Barq al-Shāmī: the history of Saladin by the Kātib ʿImād ad-Dīn al-Isfahānī*. Wiener Zeitschrift für die Kunde des Morgenlandes, lii (1953): 93–115.

Gibb, H.A.R. The Career of Nur al-Din. In K. M. Setton (ed.) *A History of The Crusades* (University of Pennsylvania, 1955): 513–527.

Glowacki, L., Wilson, M. and Wrangham, R. The Evolutionary Anthropology of War. *Journal of Economic Behavior and Organization* 178 (2017): 963–982.

Goitein, S. *A Mediterranean Society: The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza, Volume* I: *Economic Foundations* (Berkeley, CA, 1967).

Gomez, F., Meghraoui, M., Darkal, A.N., Hijazi, F., Mouty, M., Suleiman, Y., Sbeinati, R., Darawcheh, R., Al-Ghazzi, R. and Barazangi, M. Holocene faulting and earthquake recurrence along the Serghaya branch of the Dead Sea fault system in Syria and Lebanon. *Geophysical Journal International* 153/3 (2003): 658–674.

Gomez, F., Meghraoui, M., Darkal, A.N., Sbeinati, R., Darawcheh, R., Tabet, C., Khawlie, M., Charabe, M., Khair, K. and Barazangi, M. Coseismic displacements along the Serghaya Fault: an active branch of the Dead Sea Fault System in Syria and Lebanon. *Journal of the Geological Society, London* 158/3 (2001):405–408.

Gordus, A.A. and Metcalf, D. M. Neutron Activation Analysis of the Gold Coinages of the Crusader States. *Metallurgy in Numismatics* 1 (1980): 119–150.

Goren, H. 'Go View the Land'. *German Study of Palestine in the Nineteenth Century* (Jerusalem, 1999).

Goren, H. Edward Robinson, Eli Smith and the Cartography of Berghaus and Kiepert. In H. Goren, J. Faehndrich and B. Schelhaas *Mapping the Holy Land: The Foundation of a Scientific Cartography of Palestine* (London and New York, 2017): 5–53.

Gorzalczany, A. A Mamluk-Period Settlement and Cemetery at Ge'alya, near Yavne. *'Atiqot* 86 (2016): 69–110.

Gosker, J. *Metal Artifacts of the Crusader Kingdom of Jerusalem: Case Studies of the Cultural Exchange between East and West*. PhD thesis. Haifa University (2021).

Grabar, O. *City in the Desert: Qasr al Hayr East.* Harvard Middle Eastern Monographs 23–24 (Cambridge, M.A, 1978).

Grainger, J. *The Battle for Syria, 1918–1920* (Woodbridge, 2013).

Greenfield Partem, M. The Buffer System in International Relations. *Journal of Conflict Resolution* (March 1983): 3–26.

Guérin, M. V. *Description Géographique, Historique et Archéologique de la Palestine* (Paris, 1868–1880), vol. 1.

Guérin, M. V. *Description Géographique, Historique et Archéologique De La Palestine* (Paris, 1868–1880). The Hebrew edition was translated by H. Ben-Amram (Jerusalem, 1982).

Guérin, M. V. *Description Géographique, Historique et Archéologique De La Palestine* (Paris, 1868–1880), vol. 6.

Guidoboni, E., Bernardini, F. Comastri, A. and Boschi, E. The large Earthquake on 29 June 1170 (Syria, Lebanon, and central southern Turkey). *Journal of Geophysical Research* 109/B7 (2004).

Gullett, H. S. *The Australian Imperial Force in Sinai and Palestine, 1914–1918* (Sydney, 1923).

Hakimian, S. and Salame'-Sarkis, H. Cèramiqe Mèdièvales Trouvèed dans une Citerne a' Tell 'Arqa. *Syria* 65/1–2 (1988): 1–61.

Hamilton, B. *The Leper King and his Heirs: Baldwin IV and the Crusader Kingdom of Jerusalem* (Cambridge, 2000).

Hamilton, R. W. Excavations in the Atrium of the Church of the Nativity, Bethlehem. *Quarterly of the Department of Antiquities of Palestine* 3 (1934): 1–8.

Harari, Y. The Military Role of the Frankish Turcopoles: A Reassessment. *Mediterranean Historical Review* 12 (1997): 75–116.

Hartal, M. *Northern Golan Heights*: *The Archaeological Survey as a Source of Regional History.* (Israel Department of Antiquities and Museums/Ministry of Education and Culture, Qazrin, 1989) (Hebrew with English summary).

Hartal, M. *The Al-Ṣubayba (Nimrod) Fortress: Towers 11 and 9.* IAA Reports 11 (Jerusalem, 2001).

Hartal, M. Archaeological Survey as a Source for the History of the Golan. *Qadmoniot* 148 (2014): 80–89 (Hebrew).

Hartal, M. Introduction to the Archaeological Survey of the Golan http://survey.antiquities.org.il/#/Golan *see chapter 4.17*

Hartal, M. and Ben-Ephraim, Y. *The Israeli Antiquity Survey of the Golan. A General Introduction to the Survey of the Golan* (2015, Hebrew) http://survey.antiquities.org.il/#/Golan

Hartal, M. and Dar, S. Mt. Ḥermon:1985–1986. *ESI* 89:1–3.

Hayes, J. W. *Excavations at Saraçhane in Istanbul Vol*. II: *The Pottery* (Princeton, N.J, 1992).

Hayes, J.W. A Late Byzantine and Early Ottoman Assemblage from Lower City in Troia. *Studia Traica* 5 (1995):197–210.

Hillson, S. *Teeth* (Cambridge, 1986).

Hinz, W. *Islamische Masse und Gewichte Umgerechnet ins Metrsche System* (Boston and Leiden, 1970).

Hirschfeld, Y. The Anchor Church at the Summit of Mt Berenice near Tiberias. *Hadashot Arkheologiyot* 101 (1994): 29–32 (Hebrew).

Hoch, M. The price of failure: the Second Crusade as a turning-point in the history of the Latin East? In J. Phillips and M. Hoch (eds.) *The Second Crusade* (Manchester and New York, 2001): 180–200.

Hoch, N. The Choice of Damascus as the Objective of the Second Crusade: A Re-evaluation. In M. Balard (ed.) *Au tour de la première Croisade.* Byzantina Sorbonensia Vol. 14 (Paris, 1996): 359–369.

Holt, P. M. *The Crusader States and Their Neighbours: 1098–1291* (London, 2004).

Horwitz, L. K. The Sumaqa Fauna. In S. Dar (ed.) *Sumaqa — A Roman and Byzantine Jewish Village on Mount Carmel, Israel*. Bar International Series 815 (Oxford, 1999): 369–377.

Hurley, J. F. *The stone bridge over the river Jordan, near the lake of Tiberias* (AWM B01796, 1918) https://www.awm.gov.au/collection/B01796

Huygens, R.B.C. *De constructione castri Saphet: construction et functions d'un chateau fort franc en Terre Sainte* (Amsterdam, Oxford, and New York, 1981).

Hyland, A. *The Medieval Warhorse from Byzantium to the Crusades* (Suffolk, 1994).

Hyland, A. *The Horse in the Middle Ages* (Wiltshire, 1999).

Ilani, Sh. and Minster, T. *Gadot Formation Building Stones in the Hula Valley: A One-Thousand-Year-Old Tradition*. The Geological Survey of Israel. Report No. GSI/17/2009 (Jerusalem, October, 2009).

Inbar, E. and Shamir, E. What after Counter-Insurgency? Raiding in Zones of Turmoil. *International Affairs* 92/6 (2016): 1427–1441.

Ingelmark, B. E. The Skeletons. In B. Thordman, O. Norlund and B. E. Ingelmark (eds.) *Armour from the Battle of Visby, 1361* (Stockholm, 1939): vol.1:149–209.

Irwin, R. *The Middle East in the Middle Ages*: *The Early Mamluk Sultanate, 1250–1382* (London, 1986).

Ivers, T.H. *'The Khan'* (AWM ART02616, 1918) https://www.awm.gov.au/collection/C176270

Issawi, C. *The Fertile Crescent: 1800–1914* (Oxford, 1998).

Jenkins, M. Muslim; an Early Fatimid Ceramist. *The Metropolitan Museum of Art Bulletin*, May (1968): 359–369.

Johns, C. M. Medieval Slip-Ware from Pilgrim's Castle 'Atlit (1930–1931). *QADP* 3 (1934):137–148.

Johns, C. N. Excavations at Pilgrim's Castle, 'Atlit (1932–3): Stables at the South-West of the Suburb. *QDAP* 5 (1936): 31–74.

Johns, C. N. *Pilgrims' Castle ('Atlit), David's Tower (Jerusalem) and Qal'at Rabad ('Ajlun*). D. Pringle (ed.) (Aldershot, U.K., 1997).

Johns, J., McQuitty, A. and Faulkner, R. The Fâris Project: Preliminary Report upon the 1986 and 1988 Seasons. *Levant* 21 (1989): 63–69.

Johnstone, C. Those Elusive Mules: Investigating Osteometric Methods for Their Identification. In M. Mashkour (ed.) *Equids in Time and Space: Proceedings of the 9th Conference of the International Council of Zooarchaeology* (Oxford, 2005): 183–191.

Johnston, F.E. and Zimmer, L. O. Assessment of Growth and Age in the Immature Skeleton. In M. Y. Iscan and K.A.R. Kennedy (eds.) *Reconstruction of Life from the Skeleton* (New York, 1989): 11–22.

von Kausler, Eduard, H. (ed.) *Les Livres des Assises de la Cour des Bourgeois* (Stuttgart, 1839).

Kedar, B. Z. The General Tax of 1183 in the Crusading Kingdom of Jerusalem: Innovation or Adaptation. *English Historical Review* 89 (1974): 339–345.

Keller, H. The Brits are Coming. In H. Goren (ed.) *130 Years to Rosh Pinna* (Rosh Pinna, 2010): 298–299 (Hebrew).

Kennedy, C. A. The Development of the Lamp of Palestine. *Berytus* XIV (1961–1963): 67–115.

Kennedy, H. *Crusader Castles* (Cambridge, 1994).

Kervran, M. Le Niveaux islamiques du secteur oriental du tèpè de l'Apadana II. Le matèriel cèramique. *DAFI* 7 (1977): 75–161.

Khamisy, R. G. Chapter 13: Masonry and Mason's Marks. In J. A. Boas and R. G. Khamisy (eds.) *Montfort* (Leiden and Boston, 2017): 150–159.

Khazanov, A. M. *Nomads and the Outside World*, 2nd ed. (Madison, Wisconsin, 1984).

Kletter, R. and Stern, E.J. A Mamluk-Period Site at Khirbat Burin in the Eastern Sharon. '*Atiqot* 51 (2006):173–214.

Klinger, Y., Avouac, J.P., Abou Karnaki, N., Dorbath, L., Bourles, D. and Reyss, J. R. Slip rate on the Dead Sea transform fault in northern Araba Valley (Jordan). *Geophysical Journal International* 142 (2000): 755–768.

Kohl, H. Die Keramik. In T. Wiegand (ed.) *Baalbek* III: *Ergebnisse der Ausgrabungen und Untersuchungen in den Jahren 1898–1905* (Berlin, 1925): 115–135.

Köhler M. A. *Alliances and Treaties between Frankish and Muslim Rulers in the Middle East*. Translated by Peter M. Holt, Revised, edited and introduced by Konrad Hirschler (Leiden and Boston, 2013).

Kolska Horwitz, L. and Dahan, E. Animal Husbandry Practices during the Historic Periods. In A. Ben-Tor, M. Avissar and Y. Portugali (eds.) *Yoqne'am* I*: The Late Periods*. Qedem Reports 3 (Jerusalem, 1996): 246–255.

Kool, R. A Fatimid Amulet-Box with European and Islamic Coins from the Eleventh Century. *American Journal of Numismatics* 11 (1999): 47–68.

Kool, R. The Crusader Mint of Vadum Iacob: New Implications for the Minting of Coins in the Latin Kingdom during the second half of the 12th century. In *I luoghi della moneta. Le sedi delle zecche dall'antichità all' età moderna. Convegno internazionale, Milano, Università degli Studi-22/23 ottobre 1999* (Milan, 2001): 329–333.

Kool, R. Coins at Vadum Iacob: New Evidence on the Circulation of Money in the Latin Kingdom of Jerusalem during the Second Half of the Twelfth Century. *Crusades* 1 (2002): 73–88.

Kool, R. From the Horse's Mouth: Re-Dating the Anonymous TVRRIS DAVIT Issue. *Israel Numismatic Research* 1 (2006): 151–156.

Kool, R. Lead Token Money in the Kingdom of Jerusalem. *Numismatic Chronicle* 173 (2013a): 293–339.

Kool, R. *The Use of Coinage in the Frankish Kingdom of Jerusalem 1099–1291*. PhD Dissertation. The Hebrew University of Jerusalem (2013b).

Kool, R. The Crusader Purse from Tell Jemmeh. In D. Ben-Shlomo and G. W. Van Beek *The Smithsonian Institution Excavation at Tell Jemmeh, Israel, 1970–1990* (Chicago, 2014): 1026–1030.

Kool, R. Coin Finds and the Use of Money at Montfort (1926–2012). In A. J. Boas and R. G. Khamisy (eds.) *Montfort History*: *Early Research and Recent Studies of the Principal Fortress of the Teutonic Order* (Leiden and Boston, 2017): 242–255.

Kool, R. The Medieval Coins of Ashkelon (1985–2015). In T. Hoffman *Ashkelon* 8: *The Islamic and Crusader Periods* (Winona Lake, IN, 2019): 523–574.

Kool, R. The Coins at the Ottoman Police Compound (Qishle) of Jaffa (2007). In Y. Arbel (ed.) *Excavations at the Ottoman Military Compound (Qishle) of Jaffa.* (Münster, 2021a): 391–405.

Kool, R. Finding French Deniers in the Latin Kingdom of Jerusalem: The Archaeological and Cultural Perspective. In E. Ingrand-Varenne, M. Galvez and M. Aurell (eds.) *Transferts Culturels: France et Orient Latin Aux XIIe et XIIIe siècles 24–26 avril 2019/ Cultural Transfers: France and the Latin East in the 12th-13th centuries* (Paris, 2021b): 101–128.

Kool, R. and 'Ad, U. A Late Twelfth-Century Silver Purse Hoard from Ibelin. *Israel Numismatic Research* 11 (2016): 163–180.

Kool, R. and Tal, O. 'Underground' Money in an *Outremer* Estate: Token Moulds and Lead Tokens from Crusader Arsur. *INR* 9 (2015): 215–218.

Kool, R. and Tal, O. Another Token Mold and Lead Token from Crusader Arsur. *Schweizerische Numismatische Rundschau* 98 (2020): 215–222.

Kool, R. Schindel, N. and Baidoun, I. A New Assemblage of Cut Gold Fragments from the Crusader Period. *Israel Numismatic Research* 14 (2019): 169–192.

Kovach computing services: Multivariate Statistical Package, version 3.12h (2001).

Kubiak, W. Medieval Ceramic Oil Lamps from Fustat. *Ars Orientalis* 8 (1970a): 1–18.

Kubiak, W. Crusaders' Pottery of Al-Mina Found at Fustat. *Folia Orientalia* 12 (1970b):113–123.

Kühnel, E. *Islamic Art.* Translated from the German by K. Watson (London, 1970).

Labrot, J. *Une histoire economique et populaire du Moyen-Age: les jetons et les mereaux* (Paris, 1989).

Labrot, J. Les moules á mereaux. *Bulletin du Centre National de Recherche sur les Jetons et les Mereaux du Moyen Age* 40–42 (2000):1–33.

Labrot, J. Les Mereaux languedociens de la croisade albigeoise. *Moyen Age* 29 (2002): 52–57.

Lane, A. Medieval Finds at al Mina in North Syria. *Archaeologia* 87 (1937):19–78.

Leiser, G. The Endowment of the al-Zahiriyya in Damascus. *Journal of the Economic and Social History of the Orient* 27/1(1984): 33–55.

Lerer, Y. The Flour Mills in the Ridwan Gardens, ʻAkko. *ʻAtiqot* 87 (2016): 127–140.

Levine, M. A. The use of crown height measurements and eruption-wear sequences to age horse teeth. In B. Wilson, C. Grigson and S. Payne (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*. BAR British Series 109 (Oxford, 1982): 223–250.

Levine, M.A., Whitwell, K.E. and Jeffcott, L.B. A Romano-British horse burial from Icklingham, Suffolk. *Archaeofauna* 11 (2002): 63–102.

Lewis, K. J. Shifting Borders in the Latin East: The Case of the County of Tripoli. In M. Sinibaldi, K. J. Lewis, B. Major and J. A. Thompson (eds.) *Crusader Landscape in the Medieval Levant* (Cardiff 2016): 103–116.

Lewis, N. N. Baalbek before and after the earthquake of 1759: the drawings of James Bruce. *Levant* 31 (1999): 241–253.

Linder, R. P. *Nomads and Ottomans in Medieval Anatolia* (Bloomington, Indiana, 1983).

Loffreda, S. *Scavi di et-Tabgha: Relazione finale della campagna di scavi 25 marzo-20 giugno 1969*. Studium Biblicum Franciscanum, Collectio Minor 7 (Jerusalem, 1970): 174–175.

Loffreda, S. *Cafarnao* II: *La Ceramica* (Jerusalem, 1974).

Longuet, H. La trouvaille de Kessab en Orient latin. *Revue Numismatique* 4.38 (1935):163–181.

Lyman, R. *L. Vertebrate Taphonomy.* Cambridge Manuals in Archaeology (Cambridge, 1994).

Lyons, M.C. and Jackson, D.E.P. *Saladin: The Politics of Holy War* (Cambridge, 1982).

Macgregor, J. M. *Rob Roy on the Jordan* 6th edition (London, 1880).

MacKay, T. S. More Byzantine and Frankish Pottery from Corinth. *Hesperia* 36 (1967): 249–320.

Maharian, E. Firasin. *Hadashot Arkheologiyot* 112 (2000):46–47.

Mallet, A. A Trip down the Red Sea with Reynald of Châtillon. *Journal of the Royal Asiatic Society* Third Series, Vol. 18/2 (2008): 141–153.

Maʻoz, Z.U. and Killebrew, A. E. Ancient Qasrin: Synagogue and Village. *Biblical Archaeologist* 51 (1988): 5–19.

Marco, S. and Klinger, Y. Review of On-Fault Palaeoseismic Studies along the Dead Sea Fault. In Z. Garfunkel, Z. Ben-Avraham and E. Kagan (eds.) *Dead Sea Transform Fault System: Reviews* (Dordrecht, 2014): 183–205.

Marco, S., Rockwell, T.K., Heimann, A., Frieslander, U. and Agnon, A. Late Holocene Activity of the Dead Sea Transform Revealed in 3D Palaeoseismic Trenches on the Jordan Gorge Segment. *Earth and Planetary Science Letters* 234/1–2 (2005): 189–205.

Marco, S., Agnon, A., Ellenblum, R., Eidelman, A., Basson, U. and Boas, A. 817-year-old Walls Offset Sinistrally 2.1 m by the Dead Sea Transform, Israel. *Journal of Geodynamics* 24/1–4 (1997): 11–20.

Marshall, C. *Warfare in the Latin East, 1192–1291* (Cambridge, 1996).

Marx, E. The Political Economy of Middle Eastern and North African Pastoral Nomads. In D. Chatty (ed.) *Nomadic Societies in the Middle East and North Africa Entering the 21st century* (Leiden and Boston, 2006): 78–97.

Mason, R. B. New Look at Old Pots: Results of Recent Multidisciplinary Studies of Glazed Ceramics from the Islamic World. *Muqarnas* 12 (1994):1–10.

Massé, H. Imād al-Dīn. In P. Bearman, Th. Bianquis, C. E. Bosworth, E. van Donzel and W. P. Heinrichs (eds.) *Encyclopaedia of Islam, Second Edition*. Consulted online http://dx.doi.org/10.1163/1573–3912_islam_SIM_3546.

Mayer, H. E. Two Unpublished Letters on the Syrian Earthquake of 1202. In S. A. Hanna (ed.) *Medieval and Middle Eastern Studies in Honor of Aziz Suryal Atiya* (Leiden, 1972): 295–310.

Mazza, P. and Corbino, C. The Crusader's food: faunal analyses. The faunal remains from UT 83 at Al-Wu'ayra and from area 10000 at Shawbak castle. In G. Vannini and M. Nucciotti (eds.) *'Medieval' Petra — Shawbak Project Archaeological Season 2007* (Amman, 2007): 55–62.

Mcbey J. *Jisr Benat Yakub* (IWM Art. IWM ART 1559,1918) https://www.iwm.org.uk/collections/item/object/18041

Mcquitty, A. and Falkner, R. Faris Project: Preliminary Report on the 1989, 1990 and 1991 Seasons. *Levant* 25 (1993): 37–61.

Megaw, A. H. Zeuxippus Ware. *The Annual of the British School at Athens* 63 (1968):68–88.

Megaw, A. H. Excavations of 'Saranda Kolones Paphos. *Report of the Department of Antiquities Cyprus* (1971a):117–146.

Megaw, A. H. Supplementary excavations on Castle Site at Paphos, Cyprus 1970–71. *Dumbarton Oaks Papers* 26 (1971b):323–246.

Megaw, A. H. Supplementary excavations on Castle Site at Paphos, Cyprus 1970–71. *Dumbarton Oaks Papers* 26 (1972): 323–346.

Megaw, A. H. Zeuxippus Ware Again. In V. Dèroche and J. M. Spieser (eds) *Recherches su la cèramique Byzantine*. BCH Suppl. XVIII (1989): 259–257.

Megaw, A.H.S. and Jones, R. E. Byzantine and Allied Pottery: A Contribution by Chemical Analysis to Problems of Origin and Distribution. *The Annual of the British School at Athens* 78 (1982): 236–263.

Meghraoui, M., Gomez, F., Sbeinati, R., Van der Woerd, J., Mouty, M., Darkal, A.N., Radwan, Y., Layyous, I., Al Najjar, H., Darawcheh, R., Hijazi, F., Al-Ghazzi, R. and Barazangi, M. Evidence for 830 years of seismic quiescence from palaeoseismology, archaeoseismology and historical seismicity along the Dead Sea fault in Syria. *Earth and Planetary Science Letters* 210 (2003): 35–52.

Mesqui, J., Goepp, M. and Yehuda, L. *Bread for all: Double-chambered baking ovens in castles of the Military Orders*. Id: hal-02444208 https://hal.archives-ouvertes.fr/hal-02444208 1–15

Metcalf, D. M. Some provenanced finds of Crusader bezants. *Numismatic Chronicle* (1975): 198–199.

Metcalf, D. M. *Coinage of the Crusades and the Latin East in the Ashmolean Museum, Oxford*. (London, 1983; 2nd ed., thoroughly revised and enlarged, London, 1995).

Metcalf, D. M. Describe the Currency of the Latin Kingdom of Jerusalem. In B. Z. Kedar, J. Riley-Smith and R. Hiestand (eds.) *Montjoie: Studies in Crusade History in Honour of Hans Eberhard Mayer* (Aldershot, 1997): 189–198.

Metcalf, D. M. The Metrology of the Amalricus Deniers of Jerusalem in the Early Thirteenth Century. *Israel Numismatic Journal* 14 (2000–2002): 239–244.

Metcalf, D. M. The Jaffa Hoard of 1954: Crusader Coinage of the late 12th Century. *Israel Numismatic Journal* 15 (2003–2006): 138.

Metcalf, D.M., Kool R., and Berman, A. Coins from the Excavations of 'Atlit (Pilgrims' Castle and Its Faubourg). *'Atiqot* 37 (1999): 89–164.

Meyers, E.M., Krabel A. T. and Strange F. Ancient Synagogue Excavations at Khirbet Shema', Upper Galilee, Israel 1970–72. *ASOR 42* (1976): iii-297.

Meyers, E. M. Strange J.F and Meyers C. L. Excavations at Ancient Meiron, Upper Galilee, Israel 1971–72, 1974–75, 1977 (Cambridge, Mass, 1981).

Miles, G. C. Some Hoards of Crusader Bezants. *American Numismatic Society Museum Notes* 13 (1967): 189–203.

Milwright, M. Ceramics from the Recent Excavations near the Eastern Wall of Rafiqa (Raqqa), Syria. *Levant* 37 (2005): 197–219.

Mitchell, P. D. The integration of the palaeopathology and medical history of the crusades. *International Journal of Osteoarchaeology* 9/5 (1999): 333–343.

Mitchell, P. D. The palaeopathology of skulls recovered from a medieval cave cemetery at Safed, Israel (thirteenth to seventeenth century). *Levant* 36 (2004a): 243–250.

Mitchell, P. D. *Medicine in the Crusades: Warfare, Wounds and the Medieval Surgeon* (Cambridge, 2004b).

Mitchell, P. D. The torture of military captives during the crusades to the medieval Middle East. In N. Christie and M. Yazigi (eds.) *Noble Ideals and Bloody Realities: Warfare in the Middle Ages, 1378–1492* (Leiden and Boston, 2006): 97–118.

Mitchell, P. D. Nagar, Y. and Ellenblum, R. Weapon Injuries in the 12th Century Crusader Garrison of Vadum Iacob Castle, Galilee. *International Journal of Osteoarchaeology* 16 (2006): 145–155.

Monro, V. *A Summer Ramble in Syria: with a Tartar Trip from Aleppo to Stamboul* (London, 1835), vol. II.

Morgan, P. and Latherby, J. Excavated Ceramic from Sirjan. In J. Allen and C. Roberts (eds.) *Syria and Iran: Three Studies in Medieval Ceramics* (Oxford, 1987): 23–172.

Morton, N. *The Crusader States and their Neighbours* (Oxford, 2020).

Motro, H. Equid Skeletons from the Frankish Castle of Vadum Iacob: Archaeozoological Evidence of a Massacre. MA Thesis. The Hebrew University of Jerusalem (2004).

Motro, H. Medieval Equids in the Southern Levant: Methods for Characterizing Species and Breed. PhD Dissertation. The Hebrew University of Jerusalem (2014).

Motro, H., Rabinovich, R. and Ellenblum, R. Equid and Mule Skeletons at the Crusader Battle Field — What can we learn from them? In O. Ackerman, A. Faust and A. Meir *Archaeology and Environment 25th Annual Conference* (Bar Ilan University, 2005): 89–104 (Hebrew).

Najjar, M. Abbasid Pottery from el Muwaqqar. *ADAJ* 33 (1989): 305–322.

Nemer, T., Meghraoui, M. and Khair, K. The Rachaya Serghaya fault system (Lebanon): Evidence of coseismic ruptures, and the AD 1759 earthquake sequence. *Journal of Geophysical Research: Solid Earth*, 113 B5 (2008).

Nicolle, D. *Saladin and the Saracens* (London, 1986).

Nicolle, D. *Arms and Armour in the Crusading Era, 1050–1350* (New York, 1988), 2 vols.

Nicolle, D. The Reality of Mamluk Warfare: Weapons, Armour and Tactics. *Al-Masaq* 7/1 (1994): 77–110.

Nicolle, D. *Arms and Armour of the Crusading Era 1050–1350. Islam, Eastern Europe and Asia.* 2nd ed. (London and Mechanicsburg, Pennsylvania, 1999).

Nicolle, D. *Medieval Siege Weapons* 2 (Oxford, 2003): 33–39.

Northedge, A. and Falkner R. Survey and Excavations at Samarra 1989. *IRAQ* 52 (1987):121–17.

Northedge, A., Bennett, C.-M. and Bowsher, J. *Studies on Roman and Islamic Amman Vol.* I: *History, Site and Architecture* (Oxford, 1992).

O'Connor, T. A Horse Skeleton from Sutton Hoo, Suffolk, U. K. *Archaeozoologia* VII/1, 2. (1994): 9–37.

Ofir-Shemesh, A. "And in the land of Ishmael they do like this and there is no finer bread than it": The Influence of Islamic Cuisine and Diet on Rabbi Abraham Ibn Ezra's Biblical Commentaries. *Jewish Studies; an Internet Journal* 15 (2019): 1–21 (Hebrew).

Papanikola-Bakirtzi, D. Medieval Pottery from Enkomi: Famagusta. In V. Dèroche and J. M. Spieser (eds.) *Recherches sur la cèramique Byzantine.* BCH Suppl. XVIII (1989): 233–246.

Papanikola-Bakirtzi, D. *Byzantine Glazed Ceramic: The Art of Sgraffito* (Athens, 1999).

Parlak, S. A. Typological Evaluation of Arrow Slits among Elements of Military Architecture in the Medieval Period. (Istanbul University, 2011): 19–34. czasopisma.marszalek.com.pl/images/pliki/aoto/6/aoto602.pdf

Parsons, T., Toda, S., Stein, R.S., Barka, A. and Dieterich, J. H. Heightened Odds of Large Earthquakes near Istanbul: An Interaction-based Probability Calculation. *Science* 288 (April 2000): 661–665.

Peacock, D. and Williams, D. Introduction. In D. Peacock and D. Williams (eds.) *Bread for People: The Archaeology of Mills and Milling*. BAR International Series 2274 (Oxford, 2011).

Peplow, E. *Encyclopaedia of the Horse* (London, 2002).

Petersen, A. *Gazetteer of Buildings in Muslim Palestine, Part* 1 (Oxford, 2001): 182–189.

Petersen, A. Medieval Bridges of Palestine. In U. Vermeulen and K. D'hulster (eds.) *Egypt and Syria in the Fatimid, Ayyubid and Mamluk Eras* VI (Leuven, Paris and Walpole, 2010): 291–306.

Phillips, J. Hugh of Payns and the 1129 Damascus Crusade. In M. Barber (ed.) *The Military Orders* Vol. 1 (London, 1994): 141–147.

Phillips, J. *The Second Crusade: Extending the Frontiers of Christendom* (Yale University Press, 2007).

Phillips, J. *The Life and Legend of the Sultan Saladin* (New Haven and London, 2019).

Pinar, A. and Türkelli, N. Source inversion of the 1993 and 1995 Gulf of Aqaba earthquakes. *Tectonophysic*s 283 (1997): 279–288.

Pococke, R. *A Description of the East, and Some Other Countries* Vol. 2 (London, 1843).

Poirier, J.P., and Taher, M. A. Historical seismicity in the Near and Middle East, North Africa, and Spain from Arabic documents (VII$^{th}$–XVIII$^{th}$ century). *Seismological Society of America Bulletin* 70 (1980): 2185–2201.

Porter, V. *Medieval Syrian Pottery (Raqqa Ware).* (Ashmolean Museum Oxford, 1981).

Poulsen, V. Les Poteries. In P. J. Riis and V. Poulsen (eds.) *Hama: Fouilles et recherches 1931–1938* 4/2: *Les verreries et poteries médiévales* (Copenhagen 1957): 117–283.

Prawer, J. A *History of the Latin Kingdom of Jerusalem* Vol. 1 (Jerusalem, 1963).

Prawer, J. *The Crusaders: A Colonial Society* (Jerusalem, 1985).

Preston, R. M. *The Desert Mounted Corps: An Account of the Cavalry Operations in Palestine and Syria, 1917–1918* (London, 1921).

Pringle, D. Some Approaches to the Study of Crusader Masonry Marks in Palestine. *Levant* 13 (1981): 104–117.

Pringle, D. Thirteenth Century Pottery from the Monastery of St. Mary of Carmel. *Levant* 16 (1984): 91–111.

Pringle, D. Medieval Pottery from Caesarea: The Crusader Period. *Levan*t 17 (1985a): 171–202.

Pringle, D. Reconstructing the Castle of Safad. *Palestine Exploration Quarterly* 117 (1985b): 139–149.

Pringle, D. *Secular Buildings in the Crusader Kingdom of Jerusalem* (Cambridge, 1986a).

Pringle, D. Pottery. In D. Pringle *The Red Tower* (London, 1986b): 135–201.

Pringle, D. Pottery as Evidence of Trade in the Crusader States. In G. Airaldi and B. Z. Kedar (eds.) *I Comuni Italiani nel Regno Crociato di Gerusalemme* (Genova, 1986c): 449–475.

Pringle, D. Introduction and Notes. In T. E. Lawrence *Crusader Castles* (Oxford, 1988).

Pringle, D. Templar Castles between Jaffa and Jerusalem. In H. Nicholson (ed.) *The Military Orders* (Aldershot, Hants, 1998): 89–109.

Pringle, D. Castles and Frontiers in the Latin East. In A. Jotischky and K. Stringer (eds.) *Norman Expansion* (London, 2019a): 227–239.

Pringle, D. The Survey of the Walls of Ashkelon. In T. Hoffman *Ashkelon* 8: *The Islamic and Crusader Periods* (University Park, Pennsylvania, 2019b): 97–221.

Quennell, A. M. Tectonics of the Dead Sea Rift. *Congreso Geologico Internacional, 20th Session, Asociacion de Servicios Geologicos Africanos* (Mexico City, 1956): 385–405.

Raban, A. *The Portable Jar in the Ancient Near East: Typology, Distribution and Provenance*. PhD Dissertation. The Hebrew University of Jerusalem (1980, Hebrew).

Rackham, D. J. Appendix: skeletal evidence of medieval horses from London sites. In J. Clark (ed.) *The Medieval Horse and its Equipment, c.1150–c.1450* (London, 1995): 169–174.

Rahmani, L. Y. Two Hoards of 'Moneta Regis' Coins Found in Northern Israel. *Israel Numismatic Journal* 4 (1980): 72–76.

Rahmani, L.Y. and Spaer, A. Stray Finds of Mediaeval Coins from Acre. *Israel Numismatic Journal* 3 (1965/6): 67–73.

Raphael, K. Crusader Arms and Armour. In S. Rozenberg (ed.) *Knights of the Holy Land: the Crusader Kingdom of Jerusalem* (Jerusalem: The Israel Museum, 1999): 149–159.

Raphael, K. *Archers in the Crusader Kingdom*. M. A. Thesis. Hebrew University of Jerusalem (2001, Hebrew).

Raphael, K. *Muslim Fortresses in the Levant* (London and New York, 2011).

Raphael, K. and Abbasi, M. The Spatial Distribution of Villages in the Galilee during the Mamluk and early Ottoman periods (1260–1746): A Smooth Transition or a Full-Scale Crisis? *Cathedra* 179 (2020): 39–62 (Hebrew).

Raphael, K. and Tepper, Y. The Archaeological Evidence from the Mamluk Siege of Arsuf. *Mamluk Studies Review* 9/1 (2005): 85–100.

Ribot, H. Les fouilles du castrum de Saint Madeleine. *Archéologie Medievale* 15 (1985): 103–157.

Riley-Smith, J. *The Feudal Nobility and the Kingdom of Jerusalem (1174–1277)* (London, 1973).

Riley-Smith, J. *The Crusades: A Short History* (London, 1990).

Ripley, H. *Buttons of the Regular Army 1855–2000* (Surbiton, Surrey, 2002).

Robinson, E. *Biblical Research in Palestine, Mount Sinai and Arabia Petraea* (Boston, 1941), vol. 3.

Robinson. R.C.W. Tobacco Pipes of Corinth and of the Athenian Agora. *Hesperia* 54 (1983):149–203.

Röhricht, R. *Geschichte des Königsreichs Jerusalem (1100–1291).* (Innsbruck, 1898).

Roll, I. The Encounter of Crusaders and Muslims at Apollonia–Arsuf as Reflected in the Archaeological Finds and Historical Sources. In I. Roll, O. Tal and M. Winter (eds.) *The Encounter of the Crusaders and Muslims in Palestine* (Tel Aviv, 2007): 71–74.

Rosen-Ayalon, M. *Ville Royale de Susa IV: La Poterie Islamique*. Mèmoires de la Dèlègation Archèologique Francaise en Iran. Tomb L. (Paris, 1974).

Rosser, J. Excavations at Saranda Kolones Paphos, Cyprus 1981–83. *Dumbarton Oaks Papers* 39 (1985): 81–99.

Rowley-Conwy, P., Umberto, A. and Dobney, K. Distinguishing Wild Boar from Domestic Pigs in Prehistory: A Review of Approaches and Recent Results. *Journal of World Prehistory* 25 (2012): 1–44.

de Rozière, E. *Numismatique des rois latins de Chypre* (Paris, 1847).

Runciman, S. *A History of the Crusades* (London, 1994), vols. II–III.

Sabar, R. The Galilee during the Hellenistic Period (4th — 1st c. BCE): Geopolitical Changes in Light of the Settlement History and the Fortified Sites. PhD Dissertation. The Hebrew University of Jerusalem (2023).

Sabine, C. The Turris Davit Coinage and the Regency of Raymond of Tripoli (1184–1186). *Numismatic Chronicle* 7/18 (1978): 85–92.

Sade, M. Archaeozoological Finds from Strata IX–III and I. Z. Herzog and L. Singer-Avitz (eds.) *Beer-Sheba* III. *The Early Iron IIA Enclosed Settlement and the Late Iron IIA–Iron IIB Cities*, Vols. I–III. Monograph Series of the Institute of Archaeology of Tel Aviv University 33 (Tel Aviv, 2016).

Salamon, A., Hoffstetter, A., Garfunkel, Z. and Ron, H. Seismicity of the eastern Mediterranean region: Perspective from the Sinai subplate. *Tectonophysics*, 263 (1996): 293–305.

Salamè-Sarkis, H. *Contribution a l'histoire de Tripoli et de sa règion a l'epoque des Croisades* (Paris, 1980).

Saller, J. S. *The Excavations at Bethany (1949–1953)*. (Jerusalem, 1957).

Schlumberger, G. *Numismatique de l'Orient latin* (Paris, 1878).

Schur, N. *The Book of Travelers to the Holy Land, the 19th century* (Jerusalem, 1988) (Hebrew).

Schwartz, A. Cemal Pasha Feasts in the Baron's Garden. In H. Goren (ed.) *130 Years to Rosh Pinna* (Rosh Pinna, 2010): 281 (Hebrew).

Schweppe, G., Hinzen, K.-G., Reamer, S.K. and Marco, S. Reconstructing the slip velocities of the 1202 and 1759 CE earthquakes based on faulted archaeological structures at Tell Ateret, Dead Sea Fault. *Journal of Seismology* 25 (2021): 1021–1042.

Serdon, V. *Armes Du Diable*: *Arcs et Arbalètes au Moyen Âge* (Rennes, 2005).

Shapira, Y. *The Tower in the Crusader Kingdom of Jerusalem*. M. A. Thesis. The Hebrew University of Jerusalem (2000, Hebrew).

Shaqed, I. Margaliot Fortress. *ESI* 104 (1995): 16–17.

Sheffy, Y. Destabilizing the Enemy: The Raid on Nazareth, 19–20 September 1918. In E. Dolev, H. Goren and Y. Sheffy (eds.) *Palestine and World War I: Grand Strategy, Military Tactics and Culture in War* (London, 2014): 172–204.

Shipman, P., Foster, G. and Schoeninger, M. Burnt bones and teeth: an experimental study of color, morphology, crystal structure and shrinkage. *Journal of Archaeological Science* Vol 11/4 (1984): 307–325.

Shotten-Hallel, V. and Kool, R. What Does It Take and Exactly How Much? Building a Church in the Latin Kingdom of Jerusalem in the Twelfth Century. In M. Sinibaldi, K. J. Lewis, B. Major, and J. A. Thompson (eds.) *Crusader Landscapes in the Medieval Levant: The Archaeology and History of the Latin East* (Cardiff, 2016): 289–304.

Sieberg, A. Erdbebengeographie. *Handbuch der Geophysik* 4 (Berlin, 1932): 527–1005.

Sion, O. Bet She'an. *Hadashot Arkheologiyot* 112 (2000): 40–42.

Silver, I. A. The Ageing of Domestic Animals. In D. R. Brothwell and E. S. Higgs (eds.) *Science in Archaeology* 2nd ed. (London, 1969): 283–302.

Smail, R. C. *Crusading Warfare 1097–1193* (Cambridge, 1976).

Smail, R. C. The Crusaders and the Conquest of Damascus 1126–1129. In B. Z. Kedar (ed.) *The Crusaders in Their Kingdom 1099–1291* (Jerusalem, 1988): 112–119 (Hebrew).

Smith, P. and Zegerson, T. Morbidity and Mortality of post-Byzantine Populations from Caesarea. In K. G. Holum, A. Raban and J. Patrich (eds.) *Caesarea Papers* 2: *Herod's Temple, the Provincial Governor's Praetorium and Granaries, the Later Harbor, a Gold Coin Hoard and Other Studies*. Journal of Roman Archaeology Supplementary Series 35 (Portsmouth, 1999): 433–440.

Smith, R. H. *Pella of the Decapolis* I (Wooster, Ohio, 1973).

Soustiel, J. *La Cèramique Islamique Le Guide du Connaisseur* (Office du Liver Paris, 1985).

Spijkerman, A. *Cafarnao* III: *catalogo delle monete della città* (Jerusalem, 1975).

Stacey, D. A. *Archaeology of Early Islamic Tiberias*. PhD Dissertation. The University of London (1995).

StatSoft, Inc. STATISTICA for Windows (Computer program manual, 1989).

Stein, R.S., Barka, A.A. and Dieterich, J. H. Progressive failure on the North Anatolian fault since 1939 by earthquake stress triggering. *Geophysical Journal* International 128/3 (1997): 594–604.

Stepansky, Y. The Archaeological Survey of Israel, IAA, Rosh Pina, Map 18, site 140. http://survey.antiquities.org.il/index_Eng.html#/MapSurvey/2/site/478.

Stern, E. J. Excavation of the Courthouse Site at ʻAkko: The Pottery of the Crusader and Ottoman Periods. *ʻAtiqot* 31 (1997): 35–70.

Stern, E. J. Pottery from Giv'at Yasaf. ʻ*Atiqo*t 37 (1999): 125–136 (Hebrew).

Stern, E. J. The Crusader, Mamluk and Early Ottoman-Period Pottery from Khirbat Din'ila: Typology, Chronology, Production and Consumption Trends. *ʻAtiqot* 78 (2014): 71–93.

Stokes, P. A. Cut above the rest? Officers and men at South Shields Roman fort. In P. Rowley-Conwy (ed.) *Animal Bones, Human Societies* (Oxford, 2000): 145–151.

Stroud, G. and Kemp, R. L. *Cemeteries of the Church and Priory of St. Andrew, Fishergate* (York, 1993).

Syon, D. Meẓad ʻAteret — The Early Coins. In *Ateret*: *The Early Periods.* To be published in the volume that will examine the pre-Crusader archaeological evidence.

Taeko, N. Territorial Disputes Between Syrian Cities and the Early Crusaders: The Struggle for Economic and Political Dominance. In Y. Hiroyuki (ed.) *The Concept of Territory in Islamic Law and Thought* (London and New York, 2000): 101–124.

Tähir, M. A. Traité de la fortification des demeures contre l'horreur des séismes (tahsin al-manazil min hawl al-zalazil) d'abu l-hasan ʻali ibn al-gazzar, écrit à l'occasion du tremblement de terre de 984 H. /1576. *Annales Islamologiques* 12 (1974): 67–76.

Tal, O. 'Underground' Money in an *Outremer* Estate: Token Moulds and Lead Tokens from Crusader Arsur. *Israel Numismatic Research* 9 (2015): 215–228.

Tepper, Y. and Tepper, Y. The 'Horses' Barid' Dated to the Era of the Mamluk Sultan Baybars. In *Jerusalem and Eretz Israel* 1 (2003): 123–152 (Hebrew).

Thalmann, J. P. Tell 'Arqa (Liban Nord), Campagnes I–III (1972–1974). *Syria* 55 (1978): 22–118.

Toueg, R. Ramla. *Hadashot Arkheologiyot* 120 (2008): 1–8.

Toueir, K. Cèramiqoe Mamloukes á Damas. *Bulletin d'Etudes Orientales* 26 (1973): 209–217.

Tsaferis, V. *Excavations at Capernaum* Vol. I 1978–82 (Winona Lake, 1989).

Tsaferis, V. Banyas. *Ariel* (1997).

Tsaferis, V. and Avner, R. Excavations at Banyas. *Qadmoniot* 23 (1990): 110–114.

Tuchman, B. *Bible and the Sword* (New York, 1956).

Tushingham, A. *Excavations in Jerusalem 1961–67* Vol. I. (British School of Archaeology in Jerusalem; École biblique et archéologique française, 1985).

Upton-Ward, J.M. (tran). *The Rule of the Templars: The French Text of the Rule of the Order of Knights Templar* (Woodbridge, Suffolk, 1992).

van Eck, T. and Hofstetter, A. Fault geometry and spatial clustering of microearthquakes along the Dead Sea-Jordan rift fault zone. *Tectonophysics* 180 (1990): 15–27.

de Vaux, R. and Steve, M.-J. *Fouilles à Qaryat el Ènab, Abū Gosh, Palestine* (Paris, 1950).

de Vincenz, A. Ottoman Clay Tobacco Pipes from Ramla. *Atiqot* 67 (2011): 43*–53*.

Vroom, Y. *Antioch on the Orontes* IV (Princeton, 1941).

Vroom, J. *Byzantine to Modern Pottery in the Aegean, 7th-20th Century: An Introduction and Field Guide* (Utrecht, 2005).

Waage' F. O. *Antioch-on-the-Orontes* Vol. III (Princeton 1941).

Wains, D. Cereals, Bread and Society. *Journal of Economic and Social History of the Orient* 30 (1987): 255–285.

Walker, T., Sharpe, J.R. and Williams, H. Barn Owls and Black Rats from a Rural Roman Villa at Gatehampton, South Oxfordshire. *Environmental Archaeology* 26/5 (2019): 487–496. https://doi.org/10.1080/14614103.2019.1689805

Walmsley, A. G. Pella/Fiḥl after the Islamic Conquest (AD 639-c. 900). *Mediterranean Archaeology* 1 (1988): 142–159.

Warner, P. *The Medieval Castle* (London, 2001).

Watson, O. *Treasures of Islam*. Musee d'art et d'histoire (Geneva, 1985).

Watson, O. Fritware: Fatimid Egypt or Seljuq Iran? In M. Barrucard (ed.) *l'Egypt Fatimid son art et son histoire* (Paris, 1999): 295–307.

Weber, J. and Czarnetzki, A. Neurotraumatological Aspects of Head Injuries Resulting from Sharp and Blunt Force in the Early Medieval Period of Southwestern Germany. *American Journal of Physical Anthropology* 114 (2001): 352–356.

Wechsler, N., Rockwell, T.K., Klinger, Y., Štěpančíková, P., Kanari, M., Marco, S. and Agnon, A. A Paleoseismic Record of Earthquakes for the Dead Sea Transform Fault between the First and Seventh Centuries CE: Nonperiodic Behavior of a Plate Boundary Fault. *Bulletin of the Seismological Society of America* 104/3 (2014): 1329–1347.

Wehr, H. *Arabic-English Dictionary*. J. M. Cowan (ed.) 4th edition (Wiesbaden, 1994).

Weigelt, J. *Recent Vertebrate Carcasses and their Paleobiological Implications* (Chicago and London, 1989).

Weissbrod, L., Bar-Oz, G., Cucchi, T. and Finkelstein, I. The urban ecology of Iron Age Tel Megiddo: using microvertebrate remains as ancient bio-indicators. *Journal of Archaeological Science* 40/1 (2013): 257–267.

Weissbrod, L., Malkinson, D., Cucchi, T., Gadot, Y., Finkelstein, I. and Bar-Oz, G. Ancient Urban Ecology Reconstructed from Archaeozoological Remains of Small Mammals in the Near East. *PloS one* 9/3 (2014): e91795.

Whitcomb, D. Kirbet al Mafjar Reconsidered: The Ceramic Evidence. *BASOR* 271 (1988): 51–67.

Wilkinson, C. K. *Nishapur: Pottery of the Early Islamic Period*. (Greenwich, Connecticut, 1973).

Williams, D., Schindel, N. and Kool, R. Die kreuzfahrerzeitlichen Münzen im Wiener Münzkabinett Erster Teil: Die Prägungen aus dem Kreuzfahrer Staaten. Zugleich ein Beitrag zur Forschungs- und Sammlungsgeschichte der Kreuzfahrernumismatik in ihrer Wiegenzeit. *Numismatische Zeitschrift* 124/125 (2019): 269–292.

Woods, R. *The Ruins of Palmyra and Baalbek*. Ed. Benjamin Anderson (London, 2021). Wylly, H. C. *History of the Manchester Regiment (later the 63rd and 96th Foot)*. (London, 1925).

Yehuda, L. Cooking and food in the Latin Kingdom of Jerusalem. In I. Ziffer and O. Tal (eds.) *The Last Supper at Apollonia* (Tel-Aviv, 2011): 52–61.

Zadora-Rio, E. L'enceinte fortifiée du Plessis Grimoult (Calvados) contribution à l'étude historique et archéologique de l'habitat seigneurial au XI siècle. *Archéologie médiévale* 3–4 (1973–1974): 5–243.

Zeder, M. A. The Equid Remains from Tal-e Malyan, Southern Iran. In R. H. Meadow and H. P. Uerpmann (eds.) *Equids in the Ancient World* (Wiesbaden, 1986): 366–412.

Zevi, D. *The Ottoman Century: The District of Jerusalem* (Jerusalem, 1997).

$125.00
ISBN 978-0-87820-511-0
12500>
9 780878 205110