Armis et litteris

The military equipment of early Roman Palestine, in light of the rchaeological and historical sources

by

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Abstract

To date, no systematic study of the military equipment from the celebrated conflict sites of the *Bella Judaica* has been offered. Based on a large assemblage of military equipment that originated from over 70 sites throughout Palestine a typological database of the equipment was formed, the majority of which is hitherto unpublished. The arid conditions of the eastern sectors of Palestine have contributed to an excellent preservation of equipment made of perishable materials. Additionally, rare discoveries like the panoply of a Roman legionary enabled us to illustrate the images of the Roman soldiers and their opponents in the Early Roman east.

But this study draws beyond the narrow typological approach. The *militaria* of Roman Palestine is examined against its contextual background. This corpus enriches the archaeology of conflict, as the analysis of the material yielded indications for the tactics and types of weapons employed, among which are remnants of unique siege tools. The exploration of the spatial distribution of the *militaria* provided new data concerning the course of battles and revealed the identity of the participating forces and provides a platform for critical discussion about the credibility of historical sources. By reviewing the wider historical and social contexts through the spectacles of military equipment we obtain now a tool which extends and improves our understanding of the big picture, namely how the interrelations between the struggling societies were mediated and moulded by social, political and economic conditions and practices. *Militaria* appears to be a useful indicator for the status of warriors within their military society and in the eyes of the civil society which is manifested in the rabbinic literature. It further sheds light upon production and technological aspects, which appear to echo the complex Romano-Jewish interrelations and the resistance of the oppressed side to the cultural Romanisation process.

In Memory of Mordechai (Moty) Stayer

1967-1988

First Steps Soulmate

יד לזכרו של מרדכי (מוטי) שטייר

1988-1967

חבר לצעדים ראשונים

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'...mine and yours are hers' (Ned 50_a).

Volume 1 – Text

'Wisdom is better than weapons of war…'

(*Ecclesiastes* 9.18)

Part I

1. Introduction

(i) *Between worlds*

Autumn AD68 was a turbulent and hot period in the Golan. Three Roman legions were deployed in front of the wall of Gamala (*legio V Macedonica*, *legio X Fretensis* and *legio XV Apollinaris*). Breaching the wall in several points brought about a flow of storming soldiers into the boundaries of the city. In the opening to his fourth book of the chronicle of the *Bellum Judaicum* Flavius Josephus provides us with a detailed account of the battle that quickly turned into a Roman catastrophe, nearly resulting in the loss of life of the soon-to-be emperor, Vespasian. In an attempt to survive the chaos that prevailed in the city, Roman soldiers escaped the lethal crush by climbing to the roof tops which due to their weight collapsed causing numerous casualties. The Romans hardly retreated and only a month later did they manage to conquest Gamala (*BJ* 4.1ff). It was no doubt very hot at the Golan in the early summer of 1982 as well. During Gutman's excavation of Area T, the excavators uncovered a narrow alley in close proximity to one of the breaches made by *legio V Macedonica*. There, under a collapse of stones they found what I have later identified as the remains of the entire panoply of a Roman legionary, including an ownership inscription bearing his name and unit affiliation (Stiebel 2005b, 102-103; Magness and Stiebel 1996). Despite the attraction of such rare discoveries of conflict landscape archaeology, one should remember that 'many a recruit need never have struck a blow in anger, outside of a tavern' (MacMullen 1963, p. V). Focusing on the Roman east, it is enlightening to notice how central policing duty has been in the framework of the Roman army (Isaac 1992). Indeed, it is apparent that Roman soldiers have been deployed on a considerable amount of paramilitary and nonmilitary assignments, upon which much scholarly attention has focused, revealing the extant of relations between the army and the native populations (Davies 1989, 33ff; Le Bohec 1994, 14-15, 207ff; Bowman 1994; Alston 1995). The province of Judaea presents a unique case of documented resistance to Rome. In addition to the military climaxes of the two Jewish revolts that have left us with material relics, local opposition was apparently turned against Roman culture domination as well. Being fed by national, social and economic motivations, this resistance was given a religious rationalism that ensured its fixation, as particularly manifested in the rabbinic literature. Native perspectives upon daily life under Roman rule are interwoven throughout these religious compositions. Hence, in the *Palestinian Talmud* one finds an unusual instructive warning regarding the behaviour code upon encountering a Roman soldier walking down the road (PT AZ 2.1 9_b). Perhaps, the bluntest manifestation of native resistance and social idiosyncrasy is the Jewish ruling that forbad the selling of

weapons and any object that might have been used as martial equipment to the Romans (AZ 1.7; I AZ 2.3-4). It is the space between these two worlds, the conflict landscape and the civil-oriented sphere that this thesis explores.

(ii) *'Mind the Gap' – Aims and research questions*

(a) Militaria *in Roman Palestine*

In the introduction to their comprehensive composition *Roman Military Equipment*, Bishop and Coulston write that

> 'It is axiomatic that little material is known from the eastern provinces of the Empire, but this need not be purely a result of the shortcomings of archaeological methodology in these areas. Considerable amounts of equipment are known from Mauritania, so other processes (hindering the entry of equipment in to the archaeological record?) may have been at work' (1993, 37).

This dissertation is based upon the assemblage of *militaria* that has been found in Palestine from the mid-19th century and more intensively during the last four decades, which challenges this assessment. The study presents a full catalogue of military equipment from Palestine, the decisive majority of which is hitherto unpublished, encompassing over 70 sites and collections throughout the country (**Fig. 1**). The list of sites locations was compiled according to the presence of *militaria* of the relevant period and aims to be comprehensive. It was completed by the listing of equipment in museum and private collections from both Israel and abroad (Group VI). This is one of the largest assemblages of *militaria* to be amassed in the Roman Empire; for example, at Gamala alone over 1600 arrowheads and 2000 *ballista* balls were found, while some 1090 armour scales were recovered at Masada. Due to the arid conditions of the south and east sectors of the country the assemblage comprises rare organic remains that scarcely survive, like shield boards, scabbards and arrows. The geographical location of Palestine, or Judaea as it was known during the late republic and early Principate period, made it an interface zone between terrains, climates, nations and Empires. Its long shore and interlacing net of ancient international routes has set Palestine to be a cultural crossroads, between east and west. In light of its central position, it is not surprising to find that this small geographical area is blessed with ample historical sources and not least (though seemingly not to the delight of its inhabitants) with numerous battlefields. Indeed, the origin of most of the items of early Roman Judaea is conflict land contexts, which are rarely attested archaeologically in the Roman world (Coulston 2001, 23ff).

The dissertation incorporates a critical analysis of the information concerning personal panoplies of the forces that operated in early Roman Palestine, which is embodied in the

relevant historical sources as well as the sub-literary compositions, mainly rabbinical literature. Such a combination of different disciplines allows us not only to critically examine the historical perspectives on events through the study of the weapons (Stiebel 2003a), but also to provide background and context to the excavated *militaria*. This rare opportunity enables us at times to exceed beyond the technical nature of the framework of *militaria* study. The dissertation focuses on a period of nearly two hundred years, beginning with the Roman arrival in Palestine (63BC) and concluding with the end of Hadrian's reign, or in the terms of local historians, with the suppressing of the Second Revolt (Bar Kochba Revolt) (AD135/136). In the archaeology of Palestine this period is known as the 'early Roman period' and it accords well with the chronological division that is commonly used by students of Roman *militaria* (Bishop and Coulston 1993, 65-108). There are several reasons for concentrating on this specific period. Firstly, it covers possibly one of the most turbulent periods in history, and not the least important in the military history of Palestine. The major events, namely the Roman conquest of Judaea followed by the rise to power of King Herod and most notably the two Jewish revolts against the Romans, fall within its span. Moreover, as will be detailed below, many sites that came to ruin during the two great wars were excavated and yielded a plethora of well-dated martial material culture from conflict layers. An additional motivation lays in the fact that the early Principate is a well-explored period in the west, thus providing abundant comparative reference material, which enables the examination of the theme of regionalism. Describing the study of martial equipment of the Principate, Bishop and Coulston noted that: 'there is a marked bias towards material from the north-western provinces...' (1993, 65). This notion is repeated in the publication of the eastern site of Dura-Europos (SY) (James 2004, 5, 234). I hope this study and initial attempt towards a systematic and synthetic study of the assemblage of *militaria* in Roman Palestine will serve in filling this alleged gap.

(b) Range of material and structure of dissertation

The dissertation comprises of three volumes: Vol. I – Text, Vol. II – Catalogue and Vol. III – Plates. Part I of the text volume provides an introduction to the research questions, contexts and sources used in the study (Chaps. 1-2). Part II is dedicated to the particular study of the *militaria* assemblage. Originally, it consisted of multiple classes that fall under the categories of protective equipment, offensive equipment, accessories and production tools. In addition to personal equipment, I have examined military dress, *dona militaria* and military badges, the Roman *sarcina*, archery tackle, riding equipment, military chariots, military wind instruments, ritual artefacts, siege and artillery machinery as well as tents and production tools from Roman Palestine. Due to the word limit, the final version of the dissertation discusses the category of personal panoply alone, namely: helmets, armour, limb defences,

shields, edged weapons, belts, shafted weapons and clubs (Chaps. 3-4). However, it should be noted that the catalogue still presents all gathered material, while relevant data and implications from the omitted chapters were still integrated in the discussion part (Part III). The discussions of each type of equipment consist of from reviews of the historical and archaeological evidences coupled with a detailed typological study, and a presentation of tactical aspects such as range, effectiveness and employment where relevant. The discussion of each type is accompanied by figures that are presented at the end of each discussion. Part III is dedicated to synthetic discussion based on the typological study (Chaps. 5-8). The first chapters provide the social and archaeological framework in which *militaria* is studied. I further discuss the reciprocal relations between the artefacts and the varied available sources. Following are the discussions of identity, design, change and symbolism of the martial material culture. The appendices offer details concerning scientific analysis that were carried out as joint projects, most notably the DNA research of *militaria* from Roman Palestine (Appendix 1.1). In addition these present an as yet unpublished summary of an archaeozoological study of horses from Gamala (Appendix 1.2) that completed the chapter that discussed riding equipment. The materials used in the production of *militaria* in Judaea are discussed in Appendix 1.3: metals, osteological materials, wood, leather, stone and geological substances, sinew, feathers, paint and textiles. Following are indexes of *militaria* terminology used in Flavius Josephus's writings (Appendix 2) and the innovations in rabbinical Hebrew (Appendix 3), as well as a lexicon of rabbinic literature (Appendix 4). The last section offers a detailed review of the geography of Palestine (Appendix 5). The material in catalogue is presented according to sites. The sites are clustered in five groups, as much as possible according to a chronological order. Details concerning the geography and history of each site are provided, along with additional names, map references as well as bibliographical references and the archaeological context in which the military items were found. A volume of plates accompanies the catalogue, in which one can find a general view of the sites and maps that are followed by illustrations of the artefacts.

(c) Research questions

The following paragraph details the main questions that are hereby examined. However, it must be stressed that this division is somewhat artificial, presented for the convenience of discussion, and in fact most of these themes are interwoven throughout the study, most notably in Part III.

1. The nature of military equipment of early Roman Palestine

The present study intends to portray the *militaria* that comprised the personal panoplies of the varied forces that operated in early Roman Palestine. It explores each type from

typological and chronological perspectives. Beyond the establishment of the assemblage I have attempted to compare this data with the available material from contemporary western sites and to place the material in its chronological framework in comparison with earlier and later material in the east. Despite the extensive references cited in Part II and in the catalogue, it is not my intention to bring all the relevant parallels from the Roman Empire. Nevertheless, an effort was made to provide all relevant eastern parallels. Although this dissertation is first and foremost an archaeological study, historical sources appear to be very informative, mainly regarding local weapons about which Roman sources are nearly silent. Despite the omission of several relevant chapters, an important place is given to the native arsenal. This original review of local weapons includes initial artefactual identifications of historically noted weapons, like the *sica*, and further presents the materialised interpretations of local equipment that are noted in documentary texts, like the wickerwork shield or the sling that is thoroughly discussed in Ch. 5 (pp. 183-190). Beyond the enrichment of our typological knowledge the importance of local weapons further lies in the insight they provide to the possible intra-border influences on Roman weapons within the province as part of the mechanism of change in the design of military equipment (below).

2. Sources for military equipment study

Another central aim of this thesis is to highlight the potential of source comparison in studying military material culture. Studying the military affairs that occurred in early Roman Palestine and the archaeological by-products in the form of *militaria*, we are blessed with a wealth of sources. There are three main categories that are relevant to this study: the documentary (literary and epigraphic sources), archaeological and the representational evidence. The value and limitations of each of these sources are discussed in Ch. 5. It is in particular the documentary sources that single out Judaea in comparison with other provinces by uniquely providing the perspective of the native population. In general, documentary evidence consists of literary, sub-literary and epigraphic sources (Bishop and Coulston 1993, 42-47). Exploring 'the face of Roman battle', Sabin writes that: 'sadly, we do not possess for Roman battles anything like the 'soldier's eye view' which memoirs give us for more recent military history' (2000, 2). However, reading through Josephus's accounts the reader gets acquainted with the warrior's personal feelings, both of fear and anxiety during the stress of battle as well as those of triumph. His accounts take the reader to the 'trenches', whether through the eyes of the author himself, or as a witness to the experiences of the soldiers of both sides. In addition to the personal experience, most notably of a 'bystander', Josephus had access to the imperial *commentarii* (Broshi 1982). The credibility of Josephus, a much debated theme, is further examined through the spectacles of *militaria* study (Stiebel 2003a, 221ff; *apud* 2005b, 101). Although the availability of literary sources is rather even for most

of historical phases and episodes we do not have an historical testimony in the magnitude of that of Josephus for the Second Revolt and I had to do mainly with the archaeological data. Indeed, a fundamental approach of my study was that an integrative discussion is required in order to form a basis for the following theme of *militaria* in context. The information gained from these sources appears to overlap. Thus, by coupling historical descriptions, like the accounts of Josephus, with the archaeological material that at times was uncovered at the battle sites described, I was able to present a critical reconstruction of the historical events, and not less significant, an improved knowledge of the repertoire of weapons and their employment (Ch. 5 ii *a*). Rich collections of epigraphic data are not unknown in the Roman world and particularly in the east. However, unlike the finds from Dura-Europos (Fink 1971), the historical and epigraphic data from Judaea is uniquely related to the native occupied population, thus providing their perspective of the events.

Other than the historical accounts we possess the evidence of the rabbinical literature, which to a certain extent also provides a 'bystanders' view. Only a few studies have focused upon the theme of weapons in rabbinical sources (Sperber 1993, 156-162; *apud* 1996; *apud* 1998), most of which are archaic in their approach and none appears to critically incorporate archaeological data. The complexity of the rabbinical literature poses great difficulties for those who wish to effectively use the information embedded within. Except for marginal references it is literally a *terra incognita* among the students of Roman *militaria* and has suffered from bad reputation. Le Bohec wrote that: 'further details can be obtained from the *Talmud* of Jerusalem and that of Babylonia, treatises on religious matters based on real events, compiled by Rabbis between the second and fifth centuries. Until now nobody had thought of reading them with this intention. Unfortunately, the facts they relate are at worst late, at best misdated' (Le Bohec 1994, 10). As demonstrated in Ch. 5 ii *b*, this assertion has no legs.

3. Military equipment in context

An important goal of the study is the attempt to shift the attention of the local archaeological and historical communities to the field of martial culture material, this being to date a part of the somewhat neglected 'underside' of classical culture (Beard and Henderson 1995, 55) in Roman Palestine. Beyond the establishment of the typology of *militaria*, military equipment appears to shed light upon our understanding of conflict lands and to serve as a useful reflector of social phenomena and processes most notably in relation to the theme of identity, discussed in Chaps. 5 and 6 respectively. The growing number of studies of conflict archaeology (recent summary: Coulston 2001; *apud* 2005) has demonstrated the vital contribution of the study of *militaria* in context to the deciphering of the course of battle. This is particularly relevant for Roman Judaea as the decisive majority of items hereby presented

were uncovered in a conflict environment. Thus, Ch. 5 discusses the varied contexts in which *militaria* originated in Roman Palestine. The analysis of the archaeological evidence against the background of the unique historical descriptions of the battles particularly of the First Revolt has enabled me to provide a critical outline of their course, most notably of the siege-battle (pp. 166-170) and urban fighting that followed (pp. 170-172). In the Second Revolt the rebels shifted their strategy to that of classical Low Intensity Conflict (LIC) forcing the Romans to conduct a complex and costly underground and cave warfare (pp. 172-173).

4. Identity

Exploring the role of *militaria* in the formation of different identities is another key aim of this thesis. Military equipment defines warriors. It identifies the soldier as an individual within his community of fellow-soldiers (James 1999), but also as a member of military society in the eyes of the civil population; this is true with regard to institutionalised armies and militia forces alike. Examined in Ch. 6, the latter body is of particular importance as rarely do we possess any testimony for the suppressed non-Roman point of view. In this chapter, I review the political environment of Judaea, laying down the particular circumstance in which *militaria* was used and the background against which one should examine its symbolic role. The attitude towards weapons by the occupying Romans and more profoundly by the suppressed population as it emerges from the local sources provides a unique insight to the tension between globalisation and resistance to Roman cultural domination that prevailed in Judaea. A unique source that is seemingly employed for the first time in this discussion is the linguistic dimension. Possessing a consecutive coverage of local literature throughout the relevant period of time I was able to examine the model of change of the terminology of martial material culture that reflects the rate of diffusion and resistance to Roman influence (*cf.* Hingley 2005, 99ff).

It is now commonly accepted that *militaria* forms a useful indicator of status (Bishop and Coulston 1993, 196ff). Whereas among local eastern militias weapons have been gender markers throughout history (Shab 6.4), the ornamentation grammar, choice of materials and use of *dona militaria* and badges provided indications for the status of Roman *milites* (most notably p. 230ff). The focus on the personal panoply allows a closer examination in search of possible identifications of personal taste and individual innovation by the owners. Special attention is further given to the rarely identified phenomena of field-modification and hacking. This brings me to the important theme of the mechanism of **change** in equipment design in a **regional** perspective.

5. Regional diversity

Eastern military forces suffered from a bad reputation, a notion that prevailed in ancient times (Wheeler 1996; Goldsworthy 1999, 201 and *cf.* James 2004, 248) and apparently was

intensified by the prejudice of western scholars against Near-Eastern peoples (below, p. 12; 215ff; 221-223). The examination of this theme in the province of Judaea intends to establish a more coherent and trustworthy picture. The size and diversity of the assemblage and the secure contexts allow the reconstruction of the images of both varied Roman forces and local warriors according to the different historical episodes of early Roman Palestine. Particular attention is given to the comparison between western and eastern Roman equipment. Regional typology and evolution were influenced by the availability of materials and climate conditions (below). Against this background it is interesting to examine the contribution of the military artefactual evidence from Judaea to the debate of globalisation versus fragmentation of identity processes (Hingley 2005, 91ff). The examination of the equipment from Judaea that forms a geo-cultural junction (**Fig. 35: 2**) further provides an opportunity to trace cross-border influences (James 2004, 242) as well as cultural interfaces within the borders of the Empire that influenced the shaping of the equipment.

6. Design and change

The fact a particular design of *militaria* reflects aspects of human engineering and change through time stands behind an additional goal of the thesis. It is intriguing to examine the solutions that were attained by institutions and moreover by individual to problems of employment of weapons. Furthermore, the reconstructed images of the varied soldiers presented in Ch. 6 enable me to discuss the mechanism of change of the martial material culture in Roman Judaea throughout the years. Modern study of Roman martial activity in the west has mainly focused upon the institutionalised military forces. It has recently critically reviewed (James 1999) noting that often the subject of research is approached from a biased perspective of what Rome is thought to be like. The examination of the evidently multiple factors that were involved in this process shed light on social attitudes, production traditions and technological knowledge.

7. Technology and production

Final area of questions concerns how far technology and production techniques can be reconstructed. These were media that differentiated the natives from the Romans and contribute to our understanding of regionalism. The way weapons were maintained and particularly stored further present us with a combination of newly introduced and long lasting Near-Eastern traditions.

2. Research context

(i) *The potential of studying* militaria

Although the voluminous amount of martial artefacts from Palestine and their exceptional state of preservation would have deserved a separate typological research in its own right, one of the major significances of this assemblage lies in its potential illustrate our contextual knowledge concerning the broader picture. War is defined as a 'hostile contention by means of armed forces, carried on between nations, states, or rulers, or between parties in the same nation or state; the employment of armed forces against a foreign power, or against an opposing party in the state' (*OED*). It is a phenomenon with a history nearly as ancient as that of human kind, and as John Rea remarked 'War is, after all, the universal perversion. We are all tainted...' (*The Custard Boys*, Ch. 6). This complex universal human phenomenon serves as a mirror to the parties that have been engaged in the act of war as well as in the conduct of martial life. In addition to the materialistic expression of war and martial life in the image of conflict environments, military encampments and culture material that have been uncovered in archaeological excavations, war has much to do with states of mind that reflect the social and cultural portraits of the varied parties. Therefore, it is not surprising that the tools of war have the clear potential to be cultural and social markers as indeed recent studies have demonstrated (James 2004, 3-4; Bishop and Coulston 1993, 183-205). The considerable theoretical work carried out in the last decade has demonstrated the particularly constructive role of archaeology in our understanding of past societies (Hingley 1996, 10-13). The wide range of forms, functions and materials used in its production points out *militaria* as a productive medium through which social approaches, virtues, moral codes and even religious beliefs of peoples, military institutions and individuals are being revealed. Moreover, the complex changing process of the design of *militaria* sheds light on the technological levels and economies of the fighting forces of the Roman Empire. The imperial environment in which the Roman army operated has formed an excellent platform for the transference of ideas, designs and equipment. This process was nourished by its widespread deployment and contacts with both native militia forces and cross-border enemy armies. In addition, both the civil and military Roman societies were particularly open to the adoption of new designs and fighting tactics. Lastly, the complex relationships between oppressed and suppressed societies may be gleaned from the martial material culture that serves as the core of the present study. These interrelations are further enlightened owing to the rare opportunity to study military material culture within historically and socially documented contexts. This led me to the employment of a combined approach regarding text as material culture and vice versa

(Mattingly 1997a, 15; Johnson 1999, 31), which appears to be particularly informative regarding the oppressed side which is scarcely presented historically in the Roman world.

(ii) *State of research*

Until very recently there was hardly any published data or secondary literature regarding *militaria* from early Roman Palestine and it was necessary to make do with comparisons with contemporary material from other provinces, mostly in the west, or with later eastern equipment such as the assemblage from Dura-Europos. Despite this, projectiles, mainly related to torsion artillery, serve as an exception (Shatzman 1989; Holley 1994), as partly do arrowheads (Gichon and Vitale 1991) and a single cheekpiece from Jerusalem (James 1986a). The limited exposure of local scholars to *militaria* studies has generated partial publications that at times contain misidentifications. For example, the typology offered by Gichon and Vitale for arrowheads is proved to be inadequate both stylistically and chronologically (Stiebel 2003a, 217). A brief discussion of the Jewish arsenal by Price that relies heavily on a linguistic study of Josephus's *BJ* appears to be fragmentary and can be seen to contain erroneous assumptions (Price 1992, 236-237; p. 133). Moreover, until very recently, despite their historical high profile, the *Bella Judaica* were little represented in interdisciplinary studies and even then in a partial way alone, taking into account neither the artefactual evidence nor their spatial distribution within sites (*cf.* Faulkner 2004). This gap further illustrates the need for an archaeologically based research project that relies predominantly on a reliable comparative typological method, from which one should approach the historical and representational data. Attempting to elucidate the diminutive number of relevant artefactual studies I realised that the roots may lay in the fact that most of the studies relating to Roman military affairs in Palestine were written by historians, Classicists or Talmudists.

The reasons for the considerably reduced archaeological attention seem to go beyond the scope of this work and should be dealt in a wider sociological perspective, examining the place of archaeology in Israel. Still, this state of affairs is particularly interesting in comparison with a recent critical review of the history of Roman military studies in Britain (James 2002). One may carefully raise several lines of explanation that were concurrently responsible for this neglect. Initially, I may note the natural restraint from military themes and their morbid derivatives. I have personally experienced reactions of revulsion concerning my study of scalping in Roman Palestine (Stiebel 2005a), or towards an academic course concerning violence in the ancient world that I have conducted in the HU (2003). This unenthusiastic attitude is further intensified in a region like the Near East, where modern military-affairs have clearly become abhorrent. In addition, the study of *militaria* is commonly regarded as an artefactual research, which most historians are generally sceptical of with regard to its potential, if aware of it at all. As far as archaeologists are concerned, the

allegedly antiquated nature of artefactual research has evoked in recent decades much rejection, being regarded as out of fashion. This attitude against the 'old school', and the evident concentration upon the 'big picture', which focuses on monuments and urban planning rather than on the meticulousness of material culture study, appears to have prevailed until recently. Indeed, I cannot say that in our region 'most archaeologists are no longer concerned with the discovery and excavation of famous classical monuments, and the treasures of ancient art that they might contain' (Beard and Henderson 1995, 55). Additional reasons may be found in the decreased popularity of the theme of Roman equipment – being the equipment of 'the enemy'. Although, I must emphasise that one cannot aver that the results of Israeli archaeological excavations were distorted (*contra* Ben-Yehuda 2002), but merely that it was a matter of priorities or a choice of interests that stood behind this bias. It should be remembered that in Western Europe it was only during the seventies of the 20th century that scholars of the Roman army profoundly shifted their focus towards a systematic study of *militaria*. Hence, when in the early sixties of the 20th century it was to choose between the study of the rebels at Masada and that of the, previously studied, besieging Roman force, the expected preference was to concentrate upon the study of the former providing important details on the native material culture. It appears that classical archaeologists have not engaged to date in the possibility of identifying material reflections of Romano-Jewish social interrelations in the early Principate. In several recent articles I demonstrated that *militaria* serves as a prominent indicator for status, identity and social aspects of both fighting parties (1997a; 2003b; 2005b, 105; forthcoming a) and even reflects more global historical processes (2004a). The data concerning the production of weapons further echoes the differentiations between the societies and native resistance (Chaps. 5, 7; *apud* 2003a, 219-220). But there is no doubt that conflict sites are the key source for our understanding of these past events.

The breakthroughs made in the study of conflict archaeology provide us with the theoretical platform for conflict archaeological studies (Coulston 2001; *apud* 2005). More profoundly we are now in the possession of conflict sites such as: Little Big Horn (US) (Fox 1993; *apud* 1997), Kalkrise (DE) (Schlüter 1993; *apud* 1999) and Dura-Europus (SY) (James 2004; *apud* 2005) that serve as important comparative cases. The first two sites are examples for pitched battles that are less represented archaeologically in Roman Palestine. The Jewish Revolts are more typified by siege, urban and underground fighting. Still, the principle tools used in theses conflict studies, namely relying upon a meticulous documentation of the equipment within the space of the conflict land, while the subjective testimony of the historical account serves only as a complementary source, is very relevant to any form of conflict study. Although both Jewish Revolts are rather well attested archaeologically (**Fig. 1a**), their discussions to date have commonly lacked the fundamental aspects of *militaria*,

spatial distribution, destruction pattern and post-deposited processes which are integrally presented in chapter 5. In several recent publications I have demonstrated the relevancy of *militaria* study to our understanding of the martial events (2003a; 2004b; 2005b). These principals are exemplified in the Herodium article which draws beyond mere typological study. It examines the military history of the site and sheds new light upon the course of battle that is unattested historically. Following the establishment of the typology of the equipment used it reviews the change of equipment during a period of 200 years, and further provides insights into the little archaeologically known Herodian army and the two Jewish revolts. This approach is the keystone for my forthcoming publications of the assemblages from Gamala (III.3) and Qumran (III.17). Some weapons' designs appear to reflect the technique of individual fighting (*ibid.*, 105; p. 133) as well as siege warfare (*apud* 2003a, 219, 221; *apud* 2005b, 100-103), while other martial performances such as scalping (*apud* 2005a) reveals a layer of a more symbolic, ritual and social significance (Ch. 6). Indeed, the political and military events that shaped the history of Judaea and its social background are reviewed in the next section.

(iii) *Historical and social contexts*

It is useful to present here a short historical review of the main military events that occurred in Palestine during the period that is dealt within this study (63BC-AD135/136) and the participating forces, as the majority of *militaria* derives from conflict land contexts (**Fig. 1a**). Direct Roman involvement in Palestine began in 63BC when Pompey took advantage of the sibling war between the Hasmonaean Aristobulus II and Hyrcanus II to conquer Jerusalem (*AJ* 14.48-71; *BJ* 1.141-151). Pompey left Hyrcanus as ruler of Judaea but a series of uprisings by Aristobulus and his supporters necessitated repeated Roman military campaigns, in 57, 56 and 53BC, to suppress the rebellious Jews (Shatzman 1991, 132-133). Then in 43BC C. Cassius Longinus, governor of Syria, put some Roman troops under the command of Herod. Three years later Antigonus, son of Aristobolus II, took control of Judaea, supported by the Parthians, and Herod escaped to Egypt and Italy. He returned in 39BC and after three years of fighting was able to re-conquer Jerusalem and the whole country. Throughout this period Herod enjoyed the active assistance of Roman Legions. Ruling under Roman auspices (37-4BC), Herod established a substantial military force which included mercenary contingents of foreign origins, including Thracian, Galatian, German and even Babylonian Jewish soldiers, as well as a naval force (Shatzman 1991, 129-309). His army offered assistance to the Romans on not a few occasions. The growth of the kingdom was accompanied by battles, which brought about the involvement of Arabs (*ibid.*, 277-309) and Ituraeans (*ibid.*, 156, 158, 164, 185, 201, 209). In addition to armed conflicts with the neighbouring kingdoms, Herod had to quell internal unrest. The vast building projects that

characterized Herod's rule included numerous forts and fortress, where the several battles and sieges took place during his governing period (*ibid.*, 217-276), as well as some seventy years later. The death of Herod (4BC) aroused civil disturbances that were quelled by the governor of Syria – the 'Varus war' (*AJ* 17.266; *BJ* 2.52, 58, 63; *Seder Olam R* 30).

Herod's kingdom was divided among his remaining three sons and the province of Syria (*AJ* 17.317ff; *BJ* 2.93-100). The major part of the kingdom was granted to Herod Archelaus, who bore the title *ethnarch* for one turbulent decade alone. In AD6 Augustus deposed Archelaus and Quirinius, the governor of Syria, established the province of Judaea. The military force posted in the province was composed of auxiliary units, presumably on the basis of the Herodian army. It seemingly retained six units: five cohorts and one *ala*. This force recruited soldiers from the local population, most notably the inhabitants of Caesarea and Sebaste (*AJ* 19.356-366; *BJ* 2.236; *AJ* 20.121, 176; *AJ* 3.66). The information in the *NT* further suggests the presence of the *cohors Italica* (Acts 10.1), possibly the *cohort Italica Civium Romanorum* (Speidel 1982/1983, 233 – *CIL* III, 13483a (=*ILS* 9619)) and a *cohors Augusta* (Acts 27.1; *AE* 1925, No. 21). The overall military force was about 3000 soldiers strong.[1] Petronius, governor of Syria was ordered by Caligula to erect his statue in the Temple in Jerusalem. The large military force that accompanied Petronius to Judaea included citizen soldiers. A Roman detachment was garrisoned in Cypros (*BJ* 2.484), while the forts of Masada and Machaerus were also manned by military contingents (*ibid.*, 2.408, 485-486).

The Jewish unrest of the mid-60's culminated in the punitive campaign of the Syrian governor Cestius Gallus in AD66 (*ibid.*, 2.500-501). His force included the *legio XII Fulminata* and units of *III Gallica*, *IIII Scythica* and *VI Ferrata*. The disastrous results of this campaign, in which *legio XII Fulminata* lost its *aquila*, brought Nero to appoint Vespasian to suppress the Jewish revolt. Vespasian gathered a large force of some sixty thousand-strong soldiers, which comprised 'three legions...' (*ibid.*, 3.66-67) that are identified with the *legio V Macedonica*, *X Fretensis* and *XV Apollinaris*. Additionally, Josephus notes the presence of twenty-three cohorts and six squadrons of cavalry.[2] Allied kings sent 6000 archers and 3000 cavalrymen, as well as 6000 Arab soldiers (*ibid.*, 3.68). Of the auxiliary forces the only unit certainly attested as participating in the war is the *ala Gaetulorum* (*CIL* V 7007; Spaul 1994, 124-125).[3] It was recently suggested that the *cohors I milliaria sagittariorum* might have participated in the siege of Masada (Cotton, Eck and Isaac 2003, 25; Richmond 1962, 152). In addition to the 60000-strong force, Josephus further mentions the presence of numerous servants, which 'may properly be included in the category of combatants, whose military

[1] Vespasian reposted this force (*AJ* 19.366).
[2] The detachments in Ascalon (*BJ* 3.12) and Samaria (*ibid.*, 3.309) and possibly also in the Esdraelon valley (*Vita* 115) were related to the re-stationing of the Roman forces following the initiation of the First Revolt (Shatzman 1989, 470).
[3] *Cf. CIL* XVI, 33; Cotton, Eck and Isaac 2003, 19, note 13, and *ibid.*, 19ff.

training they shared' (*BJ* 3.69; Speidel 1989). Later in the campaign, in face of the siege of Jerusalem, Josephus informs us about the joining of a fourth legion: *XII Fulminata* (*BJ* 5.41). Supporting vexillations that were intended to fill 'the gaps in the four legions caused by the drafts which Vespasian had sent with Mucianus to Italy' (*ibid.*, 4.632) were shifted from Alexandria and from the Euphrates (*ibid.*, 5.42-43). Following the conquest of Jerusalem *legio X Fretensis* was stationed in the city (Stiebel 1999). It is clear that units of the legion were posted in Caesarea, the province's capital as in other strategic locations (*ibid.*, 90).

The testimony of three diplomas from AD86, 87 and 90 indicates that a body commensurate in strength to the legionary force (*c.* 5000 soldiers) served in the province after the First Revolt: *ala I Thracum Mauretana, ala Veterana Gaetulorum, cohors I Augusta Lusitanorum, cohors I Damascena Armeniaca, cohors I Milliaria sagittariorum, cohors I Thracum, cohors II Thracum, cohors II Cantabrorum, cohors III Callaecorum Bracaraugustanorum* (Cotton, Eck and Isaac 2003, 23-28; Gracey 1981, 198-206; Mor 1986; *apud* 1992, 31-41).

A dedication to Serapis was set up in Jerusalem by a vexillation of *legio III Cyrenaica* in AD116-117 (*ILS* 4393). The presence of this unit in Jerusalem may be linked with the tension that intensified to riots, if not an uprising, during Trajan's reign (AD115-117), which necessitated a military intervention (*SHA, Vita Hadriani* 5.2; Smallwood 1978; Pucci Ben Zeev 1981). The reign of L. Quietus was not quiet as attested by the reference to the 'conflict/war of Kitos' found in rabbinical literature (*Seder Olam R* 30; Rokeha 1972). The appointment of someone of consular rank as governor indicates that the status of the province was promoted from praetorian to consular. This change was associated with the increase in the garrison of the province. For the summary of the varied opinions regarding the identity of the second legion (*VI Ferrata* or *II Traiana*) that was posted to Judaea, the date of transfer and the location of its camp see: Mor 1991, 86-87, note 46; Cotton 2000, 351-357. The site used as a base camp for the second legion was Legio (V.3). At some point of Hadrian's rule, a vexillation of *legio II Traiana* served in Judaea (Negev 1964, 245-248, Pl. 54B; Isaac and Roll 1979; *apud* 1982, 9). As far as auxiliary units are concerned, a centurion of *cohors I Thracum milliaria* is noted at Ein-Gedi in AD124 (Lewis 1984, No.11), to the presence of which it is tempting to associate the military bathhouse that was uncovered at the site (Stiebel forthcoming b). By April AD128, the unit was no longer attested in Ein-Gedi (Lewis 1989, Nos. 19-20; Isaac 1992, 62-63 = *apud* 1998, 159-160; Cotton 1996). Yet, the base of the unit was presumably in Hebron, where a stamped tile bearing its name was found (Speidel 1979). *Cohors I Thracum milliaria* is further noted in a diploma from AD186 that was reported to origin in this city (Cotton, Eck and Isaac 2003, 26). The *cohors I Thracum* which is listed in the diplomas of AD 86, 87 and 90 was claimed to be a separate third *I Thracum* unit, in addition to the *cohors I Thracum milliaria* and the *cohors I Augusta Thracum* (Cotton, Eck

and Isaac 2003, 25-26). The editors of the diploma from AD90 suggested that it might have participated in the Second Revolt (*ibid.*, 26).

The Roman force that operated in Judaea during the Second Revolt included the province's Legions: *X Fretensis* and *VI Ferrata*. Detachments were sent from the eastern legions: *III Cyrenaica* (*ILS* 1071, 2083) and the *III Gallica* (*ibid.*, 2313). In addition, vexillations were transferred from the Western provinces: *legio V Macedonica* and *XI Claudia* (Clermont-Ganneau 1899, 465). A claim has been made that a vexillation of *legio X Gemina* took part in the fight (*CIL* VI 3505; VIII 7606), the evidence for which is criticised by twelve Ritterling (1911, 1685). A vexillation of *legio II Traiana* and *XII Fulminata* might have taken part in the fight (Gracey 1981, 208, note 20). Little is known about the auxiliary units that formed part of the suppressing Roman force. A dedicatory inscription from Sebaste (*ILS* 9132) was linked to the Second Revolt (Gracey 1981, 208). The *cohors III Callaecorum Bracaraugustanorum* was noted in the AD87 diploma, as well in the Diplomas for Syria-Palestina from 136/7 (*RMD* III, 160) and 139 (*CIL* XVI, 87), and may have well participated in the fighting (Spaul 2000, 92-95).

From social perspective, the Roman expansion in the east during the republic that was welcomed at first by the Maccabeans (Stern 1972), brought with it also a cultural baggage comprising of prejudices against eastern peoples. The historical sources indicate that the Roman conduct in Judaea, and in many ways throughout the entire east, involved an arrogant attitude towards other peoples. The reference of Cicero to Near-eastern peoples speaks for itself: 'Like Jews, Syrians were born slaves' (*De Pro. Cons.* 5.10). Periodically, Roman official conduct suffered from a fundamental misunderstanding of local cultural and religious sensitiveness or from merely poor leadership skills of the procurators who acted like an elephant in a china shop in the already turbulent province (for the social framework of Judaea: Schürer, Vermes and Miller 1973; Alon 1975; Gafni, Oppenheimer and Schwartz 1996). It is no surprise that relations soon went on a very slippery slope that climaxed in the First Revolt (below). From the Jewish perspective, their religious seclusion that intensified following the annexation of Judaea to the empire (AD6) poured further oil on the fire. The division of humanity into Jews and Gentiles (just as Greeks referred to all other peoples as Barbarians) commonly was interpreted as arrogance, an attitude that intensified due to the Jewish refusal to participate in imperial festivals. In the pagan Hellenistic world Jewish communities were like oil and water (Balsdon 1979, 67), a bilateral tension that did not skip Judaea as well.

During the late Hellenistic and early Roman periods, the local Jewish population underwent dramatic external and internal political changes. Winning independence against the background of the fall of the Hellenistic world and the rise of Rome, the Jews gradually lost it in the subsequent century. This process was accompanied by a major internal social crisis following the replacement of the legitimate priesthood and thereafter the substitution of the

Hasmonaean rulers of Judaea by King Herod to be followed by the annexation to the Roman Empire. The loss of the political reins was followed by the gradual loss of ritual freedom, resulting in a constant unrest and major upheavals particularly in cases that were perceived by some of the Jewish parties as an impure or a foreign involvement in the Jerusalemite Temple. This unrest was further fed by the ever-growing internal socio-economical differences, the developing nationalistic aspirations and the failure of the local elite (Goodman 1987) to control this trend. In perspective, the ruthless clashes with the Romans that lead to total destruction seem nearly inevitable. However, Judaism prevailed by changing the diskette into a mode of preservation, seemingly increasing the inherent religious attitude of seclusion encompassing also onto supposedly civil aspects. Thus, Jewish opposition to Rome is manifested not only through active interactions, but even more so by rules and particularly prohibitions that enforced cultural resistance resulting in reducing the rate of Roman cultural globalisation process – if you can't beat them you don't necessarily have to join them... The reflections of these cultural interactions may be found in my analysis of the military material cultural, for which the study of *militaria*, use and production serves as a test subject, thoroughly discussed in Chaps. 5-6. These discussions are intended to partly fill the gap noted by Goldsworthy: 'elsewhere, especially on the eastern frontiers, we have glimpse of how the opposition operated, but little more' (1996, 74). In order to place this land of conflict in context, I present next a short introduction to the geography and environment of Palestine.

(iv) *Geographical context*

The geographical study region corresponds with the sector of Palestine that is situated west of the River Jordan. As the borders of the historical kingdom of Judaea (יהודה) changed several times throughout the early Roman period, and as the term *Eretz Israel* is less familiar among the scholars of the Roman army, I have chosen to use the term of Palestine. Most of the finds derives from the territory of the state of Israel, as well as from surveys and excavations that took place from 1967 in the mountainous regions of Samaria and Judaea and the Golan Heights. It should be noted that this study draws away from the modern political definitions, and none of the above relates to the issues of modern borders, entities and rights.

Palestine is a small, narrow, semi-arid land on the southeastern coastline of the Mediterranean Sea. Despite its small size, the terrain is highly varied. A narrow low coastal plain rises to the foothills (Shphelah) and peaks in ridges of central mountains (Mount Meron 1208m). West-east oriented fertile valleys and plains starched across the country. Further to the east, the mountains drop sharply to the Rift Valley (Syrian-African rift), the lowest point of which is the Dead Sea: *c.* -408m (today). The Hula Lake and the Sea of Galilee are located in the north sector of the Rift Valley. The volcanic Golan Heights rises to the east, the north part of which is topped by Mount Hermon (2224m). The south part of the country is occupied

by the Negev desert and the arid Arabah that is located along the rift valley, most of which is covered by loess soils. The climate is temperate in most of Palestine, hot and dry in the southern and eastern desert areas. The Mediterranean climate implies sufficient rain and pleasant temperatures. In the winter it snows in the mountains' high peaks (800m+). The average annual rainfall in Judaea and Samaria reaches 600mm. Further south the average amount decreases harshly to 250mm in the Besor and Gaza brooks and to 60mm alone in the Negev. As noted above these climatic condition provided, particularly in the Judaean Desert, excellent preservation condition that resulted in the survival of rare organic artefacts. For a detailed review of the geography of Palestine, see Appendix 5.

Historical Palestine was situated between latitudes: 30° 30' N (Ayoon valley) – 29° 30' N (Gulf of Aqaba), and longitudes: 33° 50' E (Wadi el-Arish) – 37° E (eastern foot of Mount Huran) (**Fig. 1b**). Geologically, it is located on the edges of the Arab-Nubian plate. The central geo-political and geo-economical position of Palestine as a bridge between Europe, Africa and Asia played a vital role in the shaping of its history. The super-powers of the Ancient Near East between which it is spaced, Egypt and the kingdoms of the 'Fertile Crescent', left their imprint on the land over the centuries. During the Roman period, Judaea was a critical end station in the trade of spices and perfumes, functioning as the harbour on the *Mare nostrum* for the commodities that arrived mainly from the Nabataeans (Caesarea, Gaza, Ascalon, Dor and Acre). The Romans were the first to construct roads in Palestine which contributed much to the development of the country, within the empire (Roll 1976; *apud* 1983; Isaac and Roll 1982; *TIRIP*; Graf, Isaac and Roll 1992; Roll 1995). One of the most profitable products of the province, Balsam, was manufactured on the western shores of the Dead Sea (Stern 1974, 489ff). To my mind, the economic importance of this trade to the Roman Empire was one the major reasons for the campaign against Masada that was intended to ensure Roman control over the Balsam plantations of Ein Gedi (Stiebel and Netzer 2006, 60). A useful study of the economy and resources of Roman Palestine was published by Safrai (1994). During the decisive part of the study period, the eastern and southern parts of Judaea formed the frontiers of both the province and the Empire. During the mid-1st century BC Judaea, and more intensively Syria, formed part of the arena for the Romano-Parthian clashes (Miller 1993; Isaac 1992a, 199ff). Under Herod and during the early years of the Empire the southern and eastern borders of Judaea faced the allied Nabataean kingdom and related nomad peoples, relying on the line of fortifications that have their roots in the Hasmonaean period. In AD106, following the establishment of Provincia Arabia, the *limes* moved eastwards (Kennedy 2000, 35-38, 41-42, Fig. 4.2a) resulting in the abandonment of some outposts on the fringe of the province, like that of Masada. Prior to the discussion of the equipment I offer next several technical details concerning the way the study is presented.

(v) *Technical details*

The assemblage of the entire military equipment in Roman Palestine is presented in the catalogue volume. It is based on naked-eye examination of the decisive majority of the material hereby presented. The study of some of the objects that are now lost or undetectable relied on published drawings and/or photos. An effort was made to provide detailed dimensions of the objects specified in the catalogue. The dimensions are given in millimetres (mm) and grams (gr), unless otherwise stated. In the case of fragmented or broken objects the sign (+) accompanies the measure. The sign (–) indicates un-cleaned objects, mostly arrowheads, the corroded faces of which exhibit stuck debris that increases their original weight. The catalogue is accompanied by a plate volume that attempts to provide illustration and/or photo for all objects. The references to the figures are highlighted in **bold** throughout the dissertation (for example **Fig. 5: 2**). The reference to each object in the dissertation consists of two parts divided by a slash sign. The prefix testifies to the site of origin, according to the list of sites as it appears in the catalogue. The suffix of the reference notes the type of equipment (A-Q, as it appears in the catalogue) and a serial number. Hence III.19/A.2 stands for a helmet (A) fitting (No. 2) from Masada (III.19). All objects are illustrated unless otherwise stated. All un-credited photos were provided to me by the excavators and are the property of the expeditions. Where available, line illustrations were presented although this was subject to considerations of cost. The catalogue entry of each object provides a cross-reference to the plates, which notes the site number (**PL. III.3A** is followed by **III.3B** and so forth). The references to the plates are highlighted in **bold** throughout (**PL. III.3A: 1**).

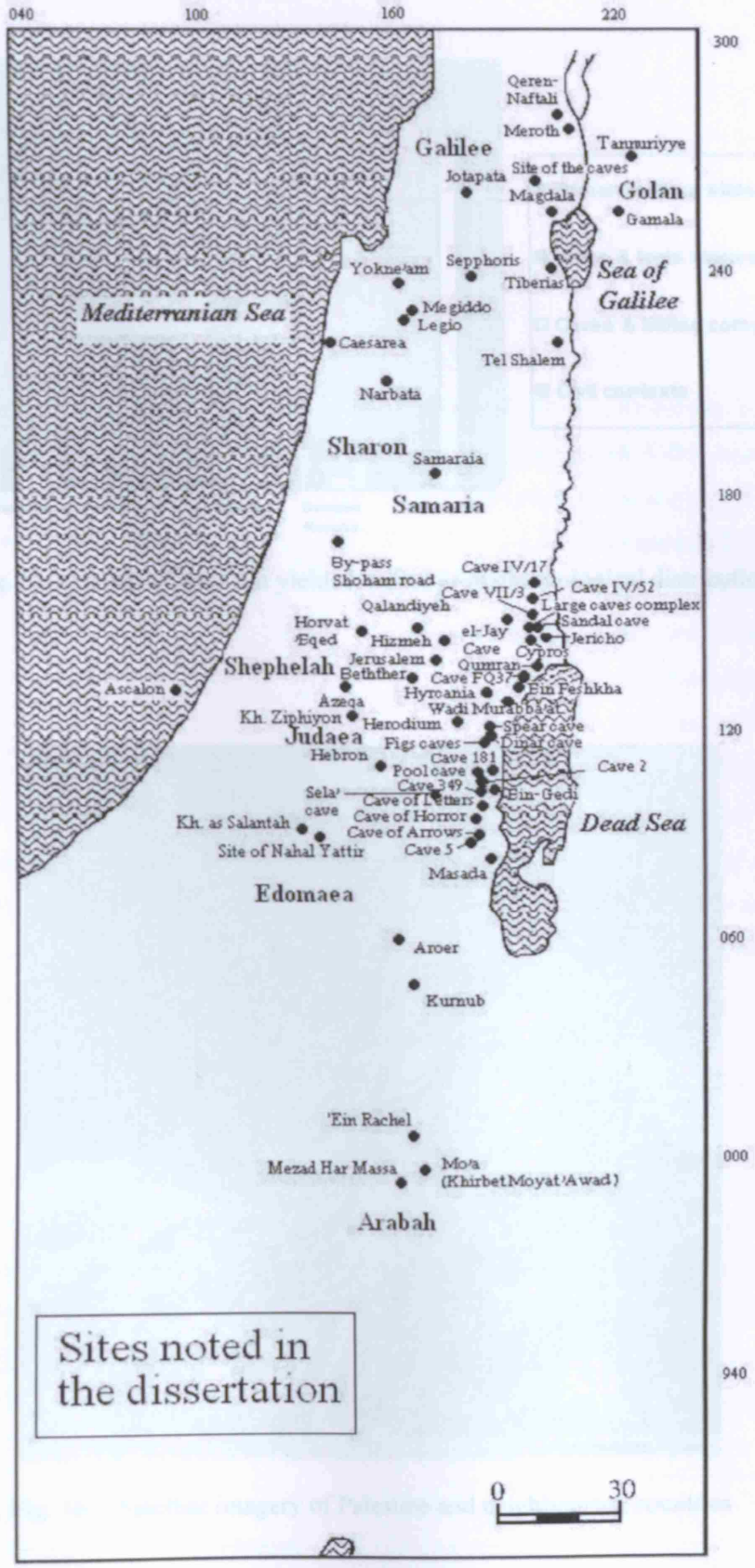

Fig. 1 – Sites discussed in the dissertation

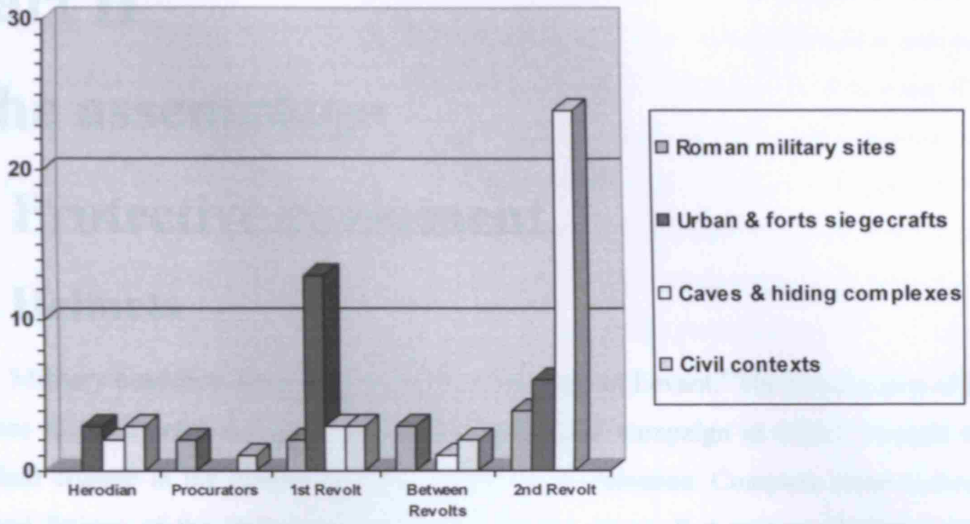

Fig. 1a – Nature of sites that yielded *militaria* in chronological distribution

Fig. 1b – Satellite imagery of Palestine and neighbouring countries

Part II

The assemblage

3. Protective equipment

(i) Helmets

Military headdress has a long tradition in the ancient Levant.[1] The introduction of Roman armies to the Levant and particularly after Pompeius' campaign in 63BC, brought about a gradual change in the fashion of arms employed in Palestine. Complete metal helmets and related fittings of the Hellenistic period in Palestine are well documented (Radan 1967-68; Kingsley and Raveh 1996, 59-60 and note 6, Fig. 40, Pl. 54),[2] while the author of the War Scroll notes the helmet amongst the panoply of the Sons of Light's cavalry.[3] The diffusion of new ideas is first noted during the early Roman period in the representational evidence. The information about the headgear in Herod's period is restricted to the numismatic testimony alone. Despite the limited contribution of coins to the study of *militaria* due to size and preservation, as well as the anachronism and propaganda that characterized most of the minted motifs, there are exceptions (Pavkovic 1992). Although studying the symbols adorning Herod's coins has proven to be a somewhat elusive matter, Meshorer argued that all motifs were copied from contemporary Roman coins, suggesting that it manifested Herod's will to honour his Roman beneficiaries and to find favour in their eyes (Meshorer 1997, 61). This group of symbols includes two military-oriented elements – a decorated shield and helmet – for which Meshorer settled for citing their equivalents upon Roman coins. However, a stylistic and iconographic examination of these minted designs, and in particular the helmet motif, appears to reflect contemporary Roman helmets and possibly south-east European or Asiatic influences (Stiebel 2003a, 215-216). A coin from Samaria (40BC) exhibits a helmet with a conical bowl and a drawn out lower rim (**Fig. 2: 1**), seemingly designed after the Italian Montefortino (Buggenum) type (Robinson 1975, 18, Pls. 10-25) (**Figs. 2: 2-3**), further confirmed by the Julii Monument, St. Remy (FR) (*ibid.*, Fig. 15 and Pls. 463-466) (**Fig. 2: 5**).[4] More significant is the as yet unnoticed presentation of a curtain (of scales or mail),

[1] Yadin 1963b, 15, 49.
[2] Helmet appear on Persian coins (Meshorer 1997, 12-13, 39).
[3] Yadin 1962, 123-124.
[4] None of the Roman republican coins appears to exhibit contemporary helmet types (Crawford 1974). Rome adopted the Montefortino type in the 3rd century BC from the Celts (Robinson 1975, 13-25; Feugère 1994, 78-81).

suspended below the neck-guard (**Fig. 2: 6**). This feature, which is unique to Herod's coins and utterly absent on contemporary Roman coins, is well attested on Asiatic and southeast European helmets (**Fig. 2: 4**).[5] Notwithstanding the time difference, the existence of vertical neck-guards on the pedestal reliefs of Trajan's Column and Herodian coinage may suggest a common origin or tradition. It is feasible that the minted neck-guard was copied from actual helmets, which equipped part of his force (that included southeast European and Asiatic units as well). If indeed so, it is yet one further example for the transitional role of Herod's regime, under which Roman arms co-existed alongside long-lasting Hellenistic traditions. During his reign, a period in which Hellenistic dominance shifted into that of Rome, the local environment was open to outside influences. We witness the absorption of a variety of foreign traditions, most of which evidently did not last beyond his death.[6]

Reading our major historical source for the mid-1st century AD events, Josephus is found to use the general Greek term *κράνη* when describing both the Roman infantry and cavalry helmet. He emphasizes that the helmets of the latter 'are the same as those worn by all the infantry' (*BJ* 3.97). The artefactual evidence derives mainly from the fields of conflicts of the First Revolt, of which the discovery of the Coolus helmet from Gamala is of particular importance, clearly being in the possession of a legionary soldier (III.3/A.1-2). Discussed below, the archaeological evidence indicates the existence of a multitude of helmets' types during the short period of the First Revolt. In addition to the Coolus and Weisenau types (III.19/A.2-3), one may count cheekpieces of Robinson's Imperial-Gallic type A (III.20/A.1), as well as the Cavalry Sports I, or Type Weiler-Guisborough (III.19/A.1). This marked typological diversity appears to challenge the somewhat rigid typologies of linear evolution offered by Robinson and Connolly (Bishop and Coulston 1993, 93).

Turning to the 2nd century AD, a cheekpiece of a sport helmet from Jerusalem seemingly dates from its early part (VI.4/A.1). To the Second Revolt, we assign the Hebron hoard, retaining of two helmets (Weisenau and a sport helmet of the Alexander type) and several fragments (V.31/A.1-3). We may further attribute the complete sport helmet from the Qidron Valley (or Jordan river) to the 2nd century.[7]

(a) Roman helmets

Three complete Roman helmets have been found in Palestine along with numerous fittings, most significantly four cheekpieces and one browguard. On the whole, the Roman

[5] *Cf.* Coulston 1988c, 341-347.

[6] Helmets on the coins of Herod Archelaus (**Fig. 2: 7**; Meshorer 1997, 73-75). It has conical outlines with an elaborate detailed *crista transversa* (Robinson 1975, 143; **Fig. 3: 1**).

[7] A Böotic helmet is depicted on a *patera* from the Cave of Letters (Yadin 1962b, Fig. 16, Pl. 17). For late representations: Bishop and Coulston 1993, 61; Caradini, Ricci and de Vos 1982, Fig. 201; Peleg 2000, 86-93, Pl. 6: 1-3.

helmet material is similar to the types used in the west. The only deviation from the typological homogeneousness of the helmet material of early Roman Palestine (namely the two Jewish revolts) is the elaborate, possibly regional variation of the décor discernable on the Wiesenau helmet from Hebron (**PL. V.31: 1-4**; below). Nonetheless, the assemblage from late 1st century AD Palestine exhibits a greater contemporary diversity than in the west. While opposing the previously suggested typological development, this artefactual evidence also emphasizes the reliance upon reused equipment and the extended periods of employment. Two main groups of helmets may be defined: 'standard' and sport headgear. The first class is commonly divided into two subcategories: infantry and cavalry helmets.

Despite the relatively limited number of helmets in Judaea of the 1st century AD there seems to have been a bias towards the employment of copper-alloy headgear, as remarkably no iron helmets are known prior to the Second Revolt period. Whether this data reflects an intentional preference or the result of differential corrosion is hard to assess, although I find it very difficult to explain this clear absence depending on preservation considerations alone. It appears that in the Early Principate iron was much less common (at least in the east) in the production of headgear, a trend that shifted in the 3rd century AD, as reflected at Dura-Europos, and more profoundly in the 4th century when it became 'universal' (James 2004, 102). In the rabbinic sources, copper was considered the metal used in the production of helmets (*Trg Sam* 8.14; Rashi Pes 74_a; *TA* III, 109).

The most important remains, in terms of contexts, are the parts of L. Magus's helmet discovered in the immediate context of the siege. Clear battle damage is visible on the browguard (or reinforcing peak) from Gamala (**PL. III.3D: 2; PL. III.3E: 1**). The oblique scar was the result of an edged weapon blow that hit the soldier's left forehead. This damage accords well with a recent study of cranial trauma in Israel throughout proto-historical and historical periods, which identified that injuries to the left side of the skull were more common (53% vs. 47%) (Hershkovitz *et al.* (forthcoming)), a phenomenon that was more prominent in the study of Walker (63% vs. 37%) (Walker 1989). The growing emphasis upon the extending of the neck-guard during the Flavian period (*ibid.*) recalls Josephus's account of the fate of the centurion Julianus in Jerusalem (*BJ* 6.81-91).

No direct indication exists for the employment of helmets by the rebels. It seems that most of the Jewish warriors were not furnished with headgear, a notion that accords with the lack of body armour. On the whole this deficiency reflects the general inferiority of the local force's protective equipment. The harsh climate of the desert was argued as one of the causes for the small number of helmets found at Dura-Europos (James 2004, 103). Although it is certain that in the heat of the Levantine arid zones, metal helmets could have threatened the

health of their wearers, the evident lack of use of metal armour by the Jewish rebels suggests that this consideration is less relevant here.

Infantry helmets

Josephus refers to the *κράνη* of the Roman infantry (*BJ* 3.93, 97). A clear case of a legionary's helmet is that belonging to L. Magus from Gamala, possibly a soldier of the *Legio V Macedonica* (III.3/A.1-2).[8] The striking resemblance between the Coolus type cheekpiece from Gamala and the examples from Schaan (LI) (Robinson 1975, 29, 31, Pls. 41-43), may hint at a common production tradition or even similar workshop. This resemblance also appears to undermine the typology of helmets of the early Principate, suggesting a more heterogeneous assemblage, in which long-lasting designs were in use along with newer types. The cheekpiece from Camp F (III.20/A.1) at Masada surely furnished a soldier of *Legio X Fretensis*. This legion seems to be the origin of the Wiesenau helmet from Hebron (V.31/A.1), which was in operation in this district during the 2nd century AD. An anecdote that appears in the *Babylonian Talmud* appears to shed light on later Roman helmets. One reads about local children playing with toy helmets: '*kona'ot* of *galeas* in children's heads' (*Zeb* 88_b). As the word *kona'ot* indicates cones (*conus*), it appears that the juveniles modelled their toy helmets after a conical helmet. In the East, the typical auxiliary helmet was of conical shape (Robinson 1975, 85, Pl. 237, Fig. 111; Coulston 1988c, 285-287). This type is commonly associated with the archers of Levantine origin and is well attested on Trajan's Column (Scenes LXX, LXXV, LXXVIII, CXV). It is thus only logical to assume that even though no conical example was yet excavated in Palestine or in the neighbouring countries, it had not been strange to their ancient inhabitants.[9] However, the composition date of the *Babylonian Talmud* (5th century AD) may suggest that the conical shape in fact followed the design of the heavy cavalry helmet. A graffiti from 3rd century AD Dura-Europos describes a *clibanarius* wearing a conical helmet, which was constructed from small plates (**Fig. 10: 2**), to be compared with the conical Sassanian helmet that was found in the countermine under tower 19 (James 1986b).

[8] Gutman has erroneously suggested that the *tabula ansata* tag was originally attached to the helmet (Gutman 1994, note to photo in p. 73 – bottom); *contra*: p. 93ff.

[9] There is, however, an alternative explanation for the phrase '*kona'ot* of *galeas*'. Inscriptions from Amphipolis and Delos refer to the helmet as *kōnos* (*RA* 2 (1935), 31, line 4 and 37, note 2). Snodgrass claims that this term designates 'either Thracian, or more probably, Boeotian type' (1967, 155, note 11). It may be suggested that the *Babylonian Talmud* uses a Greek anachronistic term, which indicates a helmet, particularly as the Boeotian helmet was known long after it went out of ordinary military use. It is depicted on a gem from 2nd century AD Jerusalem (Peleg 2000, 86-93, see p. 91).

Cavalry helmets

According to Josephus, the Roman cavalry were equipped with helmets similar to the infantry (*BJ* 3.97). At Masada, the discovery of a cheekpiece of Type Weiler (Feugère 1994a, 104-110) in the dwellings of the rebels may assigned it to 'garrison A' that had manned the fortress until AD66 (below). The same elucidation is applicable to a cheekpiece found in area N7, Masada, together with a lunate harness pendant.[10]

(b) Sport helmets

Sport equipment, also referred to as parade equipment, best manifests the auxiliary Roman soldiers' fondness of decorative equipment (Robinson 1975, 107-135; Garbsch 1978; Feugère 1994a, 123-140; Junkelmann 1996, 18-56; Born and Junkelmann, 1997). Consisting of elaborate helmets, breastplates, and greaves along with fancy horse equipment, the lavish panoply is commonly associated with the *hippika gymnasia* practised by equestrian units.[11] Overall, the visored helmet (*casque à visage*) is the most well-represented sport tackle in the archaeological repertoire. The masked helmet appears to be a descendant of the Hellenistic helmets, known from both representational and the archaeological evidence (Robinson 1975, 107). Browsing the distribution maps of the sport equipment, published to date, it is striking how poorly the Roman east is represented (Garbsch 1978, 92-93). Merely a single helmet is linked with Judaea, that is the celebrated helmet found in a cave in the vicinity of Hebron (**PL. V.31B: 1-6**).[12] The iron face helmet belongs to the 'Alexander type', featuring the image of young Alexander, his head being decorated with a copper-alloy wreath (V.31/A.2). However, three more examples have been uncovered in Palestine. The first is a cut fragment of a sport helmet, exhibiting an embossed ear (V.31/A.3) and part of the so-called Hebron hoard. The size and shape of this find clearly indicate that it was scrap intended for recycling. This appears to support the view that the Hebron hoard represents a collection of metal military artefacts, evidently booty from the Roman army, whose owner designated it for recycling. The fact that a scrap artefact found its way into the hoard seemingly suggests it was not intended to be used as weaponry for being caught red-handed with such a cache would have put the owner in dire straits. It is therefore only reasonable to assume that the intention was to recycle the material in the future.

In addition to this fragment, a helmet with a complete mask that is reported to come from Jordan appears to have actually originated west of the Jordan river (**Figs. 4: 1-2; 5: 1**; Baur and Rostovtzeff 1931, Pl. XXIII; Bottini *et al.* 1988, 534-536, Abb. K 117a-b, d). Based upon

[10] Not included in the dissertation.
[11] For training and parade grounds of the Roman cavalry: Davies 1989, 93-123; Hyland 1993.
[12] The claim that finds from L4019 at Gamala retained a helmet visor (Syon 2001, 145) has no basis unless it is only a careless use of terminology indicating in fact the browguard.

typological criteria, the helmet is dated to the 3rd century AD. According to a document in the archives of the PEF, London, the helmet was found in the Qidron Valley[13], which commences in Jerusalem and flows through the Judaean Desert down to the Dead Sea. If it comes from the vicinity of Jerusalem the helmet may be linked with Roman presence in *Aelia Capitolina*.[14] Otherwise, it could have originated in a refuge cave in the eastern sector of the Judaean Desert and dated to the Second Revolt like the Hebron specimen. A pencil remark on this document raised the possibility that the helmet was found in the Jordan river. However, the state of preservation seems to exclude a waterlogged origin, and no recording of any investigation that involved discoveries in the river are known to date.

A fragmentary cheekpiece derives from Masada (III.19/A.1). Considered as a cavalry helmet, it appears, according to some scholars, to fall under the category of sport equipment. Parallels to this type are known from a large number of sites in the west: Gloucester (UK) (Robinson 1975, 134, Pl. 406), Brough, Nottinghamshire (UK) (*ibid.*, Fig. 401), Yredoorn (NL) (*ibid.*, Fig. 399), river Waal (NL) (*ibid.*, Fig. 269), Leicester (UK) (Feugère 1994, 106), Wels (AT) (Garbsch, 75: O 69, Taf. 33: 2), Theilenhofen (*ibid.*, 115) and Sarmizegetusa Regia (Petculescu 1990, 843-844, Fig. 2). To this group we may add the specimen from Jerusalem (Warren's excavations?), now in the PEF collection (James 1986a), and possibly also a minute embossed fragment from Gamala (III.3/A.8) that bears resemblance to the Guisborough type, in particular the helmet from Theilenhofen (DE) (Garbsch 1978, 55-56: F 1, Taf. 10). Eastern parallels may be found in the example seemingly from Zeugma (Kennedy and Bishop 1998, 135, Fig. 8.13) and in the possible fragments of a sport helmet from Dura-Europos (James 2004, No. 377, Fig. 50).

(c) Helmet lining and headgear

The metal structure of the helmet was evidently lined from inside by felt, wool, flax, textile or leather in order to protect the head from the metal. In addition, padding provided a better adjustment of the helmet to the head. Little direct evidence for lining exists due to the perishable nature of the organic material: Newstead (UK), Hod Hill (UK), Vindonissa (CH) (Robinson 1975, 144), Brigetio (HU) (Bishop and Coulston 1993, 93), and Didymoi (EG).[15] Minute remains of lining survived on the inside of the cheekpiece of L. Magus's helmet (III.3/A.1). In the case of Gamala, flat-headed rivets were evidently used to secure the lining, while in the west the use of glue is attested at Newstead (Curle 1911, 166) and Hellingen

[13] I thank Shimeon Gibson for this information.
[14] Stiebel 1999.
[15] Flax padding was identified among the material unearthed at Didymoi (EG) (Hero Granger-Taylor, *pers. comm.*).

(LU) (Robinson 1975, 144). Robinson assumed that the lining could have been secured to the rim of the helmet (*ibid.*).

In addition to lining, caps were independently worn under the helmet (Amm. Marc. 29.8.8). An arming cap made of woollen cloth and felt is reported from Dura-Europos (James 2004, No. 378, Fig. 51). Yet, it appears that leather skull-caps were used as a protective headdress on their own account. Polybius, describing the equipment of the Roman *velites*, mentions such headgear (Polyb. 6.22.3). Even though most of the German warriors used to fight bare-headed, Tacitus notes that some did use a sort of leather head cover (Tac. *Germ.* 6). Ammianus Marcellinus used his headdress to draw water from a deep well (AD359) (Amm. 19.8.8). According to Vegetius:

> 'Almost down to the present day the custom survived whereby all soldiers wore leathern caps which they called "Pannonians". This was observed so that the helmet should not seem heavy to a man in battle, who was used always to wearing something on his head' (Veg. 1.20).

This leather cap is generally regarded as a part of the military non-fighting dress of Late Roman times.[16] However, as it appears in clear military association, following the description of the *velites* battle-dress, it is not impossible that Vegetius' words do testify to the actual existence of leather headgear in the early Imperial Roman army. Such headgear is seemingly noted in the *Babylonian Talmud*, which uses the *sanvarta* (סנוארתא) (Shab 62_a), and according to Rashi, *sanvarta* was a leather cap, which was worn under the helmet. However, as this term derives from the ancient Persian word *sārāvarti*, which means a head-cover, it may merely designate a headdress.[17] Be that as it may, the leather helmet is twice mentioned in the Talmudic literature (T BM 3.24; $BM58_b$). In the mid-second century AD it was allowed to sell the חטיטוס (*χατᾶτος*), as well as the sword, shield and horse, for any price above their market-price in time of battle, because lives depended on them (Sperber 1975, 168-174). Following Krauss's suggestion, Sperber has demonstrated that this term originated in the Greek word *χαταίτυξ*, which designated a leather skull-cap (Krauss 1899, 250; Sperber 1975, 168-174). This rare word is Homeric (Homer *Il.* 10.258), yet it was known later, in the Roman and Byzantine periods (Sperber 1975, 171-172). It should be noted that the works of Homer comprised part of the Sages' bookshelf, as is well attested in the rabbinical literature.[18] Thus, whether anachronistic or not, it is not infeasible that the Sages used Homeric terminology to

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[16] The most famous representation of which is seemingly the relief of the Tetrarchs in St. Marcus Plazza, Venice (IT) (Milner 1996, 22, note 1). For the military (pill-box) hat: Croom 2000, 68.

[17] In later dialects *saravāra* denotes a hat.

[18] Yad 4.6; PT Sanh 28^a_{18}; *Mid Ps* 1.8; *Jalk* 613, 678.

describe an actual artefact. As demonstrated above, leather military caps were amply employed in the Roman world, and not least in the Roman east. It should be noted that leather caps had a long tradition in the Levant, as the Egyptian as well as the Canaanite and the Phoenician nobles used to wear a closely-fit leather cap (Stern 1991).[19]

(d) Constructional components

This section is dedicated to a general overview of the varied components of the helmet material from Palestine, providing more observations as to their function and development. The primary function of the helmet was to provide protection to the soldier's skull and as much as possible, without rendering its use impractical, to the face and in particular the ears. The protecting devices were designed to enable reasonable visibility and refrain from preventing the soldier from hearing orders. Iron and particularly copper-alloy bowls alone did not suffice to defend the warrior head. Hence, the addition of defensive elements appears inseparable from the Roman helmet. Comparing the Republican helmets with types of the imperial times reveals that more and more effort was devoted to the design of these apparatus. Indeed, Roman soldiers were apparently well protected, as is occasionally attested in the fewer numbers of casualties in comparison with many of their foes; the occurrence of the centurion Julianus death serves as a fine example (*BJ* 6.81-91). The evolution of these elements reflects both fashion trends and sources of influence, as well as modifications which were required in the face of the foes' weapons (p. 224ff).

Cheekpiece

The cheekpiece (*buccula* = *παραγναθίς*) protected the head's sides, as well as the part of the neck and at times the ears. Several techniques were used in the production of Roman helmets' cheekpieces. In addition to cast copper-alloy examples (III.3/A.1-2, III.20/A.1), an embossed cover of a sport helmet is reported from Masada (III.19/A.1). The latter features the typical cable border and the palmette motif, but no indication as to the nature of the mythological design, that commonly occupied the centre of the cheekpiece is available. In addition, the cheekpieces of the sport helmet feature the embossed outline of an ear which covered the organ (V.31/A.2-3; James 1986a), at times furnished with drilled holes that allowed improved hearing.

The cheekpieces were attached to the bowl through a hinge made of either cast copper-alloy projections (**Fig. 3: 3**) or riveted iron hinges (**Fig. 3: 4**). The inner face was commonly padded by leather or felt lining which prevented the cold or hot touch of the metal. The

[19] Leather (or felt) caps (*pilleus*) protected the heads of Roman charioteers (Junkelmann 2000c, 92, Figs. 101-103; Ewigleben 2000, Fig. 151).

common structure of shallow raised central panels allowed the introduction of a lining to the sunken inner face of the cheekpiece (**Pls. III.20: 2; III.20A: 1**), which was fastened by several flat-headed rivets. The thickness of the lining was 2mm as attested by the space between the cheekpiece's body and the head of the rivet on the object from Gamala (**PL. III.3C: 2** - note arrow). Cheekpieces were attached to each other under the soldier's chin by means of leather straps that were laced through loops that furnished their lower inner face (**Fig. 3: 5**; III.20/A.1, III.3/A.1, III.19/A.5; V.31/A.1).

Discussing the rulings concerning the purity of *militaria*, the *Mishnah* dedicates a specific *halachah* to the helmet:

> 'A helmet is susceptible to uncleanness but the cheekpieces are not susceptible; but if they have a cavity that will hold water they are susceptible' (Kel 11.8).

The bowls are not pure for they serve as receptacles. The cheekpieces, however, are taken to be pure for they are commonly flat. Nevertheless, there are exceptions. The criteria of water holding represents in the *Mishnah* the smallest possible measure for a receptacle. The above noted ruling implies that there were, as is also attested in the archaeological finds, cheekpieces that, flat as they were, had still either a curved or embossed structure and could have served as receptacles.[20] Others were designed to contain a leather or flax lining which was fixed to the inner face of the cheekpiece by means of rivets. The *halachah* refers to the entire range of helmets' cheekpieces which were present in Palestine during the first two centuries AD.

Ear-protectors

The Early Principate helmets saw a tendency towards complete covering of the ear by the cheekpiece, which was later abandoned in favour of recesses for the ears. In order to protect the outer ear from slashing blows, arched ear-protectors were fastened to the bowl's sides above the lateral cut-outs. One ear-protector was found at Gamala (III.3/A.6). The lack of any attachment holes indicates it was soldered to the bowl. The ear-protectors featured on the Imperial-Italic G helmet from the Hebron district were fastened to the bowl by two rivets. The sport helmets present a different approach to confront the threat to the ears, the shape of which was embossed on the cheekpiece (above).

Browguards

Only two browguards (or reinforcing peaks) have been unearthed in Roman Palestine (V.31/A.1 and III.3/A.2). Nevertheless, the two right-angle sectioned objects are of high

[20] Bartenura suggested that the cheekpieces were literally used as makeshift cups in time of battle, recalling the noble act by Alexander the Great (Plut. *Vit. Alex.* 42.6-9; Arrian *Anab.* 6.26).

interest and importance. The browguard from Hebron presents us with an infrequent example of decoration applied on a bronze strap that sheathed the iron reinforcement element. It consists of alternate punched motifs of dome-head bosses and nine-dot circles (**PL. V.31: 2-4**). The complete copper-alloy example from Gamala, coated by tin, is distinctly a product of high quality smithery. Yet, the item appears to be rather deformed. A close examination of it identified the origin of the twist in a focal point on the item's surface. Just off the centre left, an oblique impact is visible, representing a severe blow that came from the above left (**PL. III.3D: 2; III.3E: 1**). The direction of the impact suggests it was the outcome of an edged weapon's blow, employed by a right-handed foe presumably during the Roman assault on the city. Strong as it was, the blow did not result in Lucius Magus's death and presumably not even his injury for the browguard absorbed the impact.

Skull-guards

The integral reinforcement bars (cross-bars) on the Weisenau type helmet from the region of Hebron represent the adoption of this constructive feature, which was the Roman answer to the intimidating *falx* during the Dacian wars (Coulston 1988c, 192-193).[21] The bar that runs sidewise is riveted over the front-to-back bar. Both bars have a semi-circular section.

Neck-guards

The neck was relatively exposed to injuries, which would have been fatal. It seems that two traditions of neck defence existed: vertical and horizontal guards. In the late Republic and the early Principate the vertical neck-guard was evidently alien to the Roman army, mostly found attached to the helmets of the natives of South-Eastern Europe and of the Levant, presumably reflecting a Mesopotamian influence (above). The horizontal neck-guard was mainly effective against a down-directed sword blow, manifesting its Celtic, or more generally its western origin. Most of the Roman soldiers of the 1st century AD were so equipped. The broad horizontal neck-guard further provided protection to the shoulders. Yet, at times the raging battle challenged the effectiveness of this element. When one Julianus tumbled and slipped over a stone paved street in Jerusalem, he was forced to 'draw in his neck', in order to gain few more minutes before he was despatched (*BJ* 6.87). Lying down and being equipped with a 'standard' Roman helmet with a horizontal neck-guard, his neck was obviously exposed. The occiput of the helmet from the Hebron district (V.31/A.1) has three horizontal ridges, which seemingly strengthened its construction (in a similar manner of the mid-rib of scales) and assisted in deflecting downward striking blows. There are three

[21] Helmets from Berzobis (RO) (Petculescu and Protase 1975) and Brigetio (HU) exhibit crossbars that were secondary feature (Connolly 1988b, 23).

pronounced semi-circular ribs on the neck-guard.[22] This element further furnishes Imperial-Gallic helmets.

Edge-binding

Copper-alloy U-guttering edge-binding of both check-pieces and the neck-guard became very common from the second quarter of the 1st century AD. Clear pieces of evidence from the First Revolt were unearthed at Gamala (III.3/A.3-5), while the perimeter of the complete infantry helmet from the Hebron district, dated to the Second Revolt, is entirely edged by a U-guttering binding.

Helmet handles

Carrying handles appear on helmets' neck-guards from the early Principate (Robinson 1975, 47, 51, Figs. 76-80). The handle tapers to looped 'acorn' or ridge-and-grooved terminals. Such handles are documented at Jericho (I.4/A.1), Gamala (III.3/A.7), Masada (III.19/A.7-14), Kh. Qumran (III.17/A.1) and Legio (V.3/A.1). Commonly identified as helmet handles (for example: Allason-Jones and Miket 1984, 164, 166), the find of isolated handles, in particular with no direct military association, may be misleading and does not necessarily indicate *militaria*. This interpretation is based upon the fact that this type appears on domestic utensils such as jewellery boxes (Edelstein 2002a, Fig. 25: 4, 6-7; *apud* 2002b, Fig. 35), medical boxes, mirror cases and cupboards drawers (Manning 1985, Pl. XVI).

Decoration

The decoration of the helmet material from Palestine is similar to the contemporary examples, but for the elaborate Weisenau specimen. The skull of the Hebron helmet (V.31/A.1) was ornamented by four lunette motifs which presumably had symbolic protective intentions (**PL. V.31: 3; V.31A: 3**). The copper-alloy lunette features were soldered to the skull, the horns of which point upwards. Their perimeter is decorated by raised punched dots and a circle of dots is spaced in the curved centre.[23] The helmet's rim was decorated by what was described as embossed pairs of laurel leaves and barriers, set between a reeded perimeter (**PL. V.31: 2; V.31: 4**), although it may be alternatively interpreted as branch of an olive-tree with fruits. Be that as it may, this being the sole example of this décor might suggest an eastern origin for it. The ornamental bosses found at Gamala (III.3/B.1), in as much as they are associated with the '*lorica segmentata*', might have been decorative helmet fittings, similar examples for which are frequently found on western material. Tinning was used in the

[22] Michael Bishop informed me about the dissatisfaction of Robinson with the reconstruction of this neck-guard.

[23] This punched decoration was compared by Robinson to that which ornaments the fittings of the Newstead type '*lorica segmentata*' (Robinson 1975, 73, 174-175).

decoration of the helmet from Gamala (III.3/A.1-2), while the embossing technique was employed in the manufacture the Weiler-Guisborough helmet from Masada (III.19/A.1), both techniques are well attested in the west.

(ii) Armour

One of the greatest advantages of the Roman soldier over the Jewish foe was his personal protective equipment (*BJ* 4.424). It appears that unlike the rebels, fighting clad in armour was the standard practice for the Roman legionaries, and for most of the auxiliary troops as well, a fact that is dramatically reflected in the law reported figures of casualties among the Romans during the First Revolt combats (*ibid.*, 2.508, 3.198, 3.477). Indeed, we possess very little historical evidence for the Jewish employment of armour (*ibid.*, 5.323).[1] The futility of applying light weapons against an armoured foe is best reflected in Josephus's narration of the naval engagement on the Sea of Galilee. The Jewish skiffs were closing on the Roman rafts, but

> '...their stones produced nothing but a continuous rattle in striking the men well protected by armour, while they were themselves exposed to the arrows of the Romans' (*ibid.*, 3.524-525).

During the Early Roman period five armour types are known all together from Palestine: segmental and scale armour, mail, a rarer type of a mail coated by scales and leather armour. Over one thousand related individual items were found, the largest group of which is by far the scales from Masada. Found in several concentrations, about 1090 scales are documented altogether. As for complete examples and large sections, two complete suits were unearthed intact in Palestine: scale armour from Sepphoris (III.6/B.1) and a mail shirt from a cave near Hebron (V.31/B.1). A complete section of scale armour was found near Legio (V.3/B.1), while the most interesting finds are sections of a legionary '*lorica segmentata*' found on the battlefield of Gamala (III.3/B.1). The earliest finds derive from Jericho and Masada. Two pairs of iron scales with two attachment holes were uncovered in Jericho in a Herodian context (I.4/B.1-2). At Masada, the scales that were exposed mainly in the northern sector of the site were widely accepted to represent suits of armour from the First Revolt (Yadin 1965, 16; Magness 1992, 63-64). However, I was puzzled by the fact that despite the excellent preservation conditions, not even one instance of fastened scales was observed.[2] This clearly negates the association of the scales with the skeleton of one of the rebels, which was subsequently identified as a warrior (Yadin 1965, 16-17; *apud* 1966, 54). Added to the fact

[1] One can discern an apparent similarity in the meagreness of equipment between the rebelling forces of Judas Maccabaeus and that of the First Revolt in comparison with the organized armies of both the Seleucid and Roman armies respectively (1 Macc 4.6).

[2] At Gamala, of the three scales uncovered, two were found attached.

that these scales lack any sign of attrition, they appear, in fact, to be spare scales, presumably from the magazines of King Herod (below).[3]

The general function of the armour, as it is reflected in Josephus's account of the First Revolt, was briefly discussed (Gichon 1993). To designate body armour, Josephus uses *θυρᾰξ* and *θώρακας* and *κατάφρακτοι* (Appendix 2). Despite the evident effectiveness of the Roman armour, being clad in metal armour was not without danger. During the fierce fight around the breach at Jotapata the defenders poured boiling oil on the Romans, which 'instantaneously penetrated beneath their armour from head to foot, spreading over the whole surface of their bodies and devouring the flesh with the fierceness of a flame...' (*BJ* 3.274). Substantial remains of '*lorica segmentata*' suits were found at Gamala (AD67), the most significant of which are those that consisted part of the panoply of the legionary L. Magus (pp. 37-39). In addition to the fragments of iron plates, a large group of armour fittings was found in this excavation as well as at Masada, while hinge buckles are further documented in Jerusalem and Legio. Scales were found in several First Revolt sites. The discovery of isolated scales or small fragments, at Masada, Gamala, Kalandia and in the Cave of the Sack, presumably represents losses from general attrition. The scale from Kalandia exhibits battle damage which presumably caused its detachment from the suit (**PL. III.8: 3**). Scales were also found in Narbata but they were not available at the time of writing for examination (Zartal, *pers. comm.*). Large iron scales from Gamala (Type 12) may have been part of *cataphracti* armour, which are of special interest as they presumably reflect Asiatic, or more precisely Parthian influence that is noticeably represented in the Duranic sets of horse armour (James 2004, 113-114; Mielczarek 1993). A small fragment of a mail was found in our recent excavations at Masada, near the Roman breach (not included). In the Upper-City of Jerusalem two small fragments of a mail coated by very small scales were uncovered (pp. 49-50).

Turning to the Second Revolt, attrition appears to be responsible for the single scale discovered at Bethther (V.6/B.1), and for the examples found on the slopes of Tel Megiddo (V.4/B.1-4). The best dated fragment is reported to originate in a Judaean Desert refuge cave. Now in the Hechte Museum, it was found together with a Bar-Kokhba coin – Year A (AD132) (VI.2/B.1; Meshorer 1998, 124, No. 447). A collar segment or shoulder-piece of a scale cuirass was found in the environs of Legio (V.3/B.1). The row of iron scales from the Hebron 'hoard' (V.31/B.2) seemingly served as a hem for the mail, although theoretically they could have been merely scavenged scales that were intended for recycling. Interestingly, to date no artefactual evidence for segmental armour is documented in Second Revolt

[3] A 1st century BC thigh guard: p. 60.

contexts. 2nd century artistic representations of muscled armour are reported from Caesarea and Tel Shalem (pp. 51-52).

In addition to term *shiryon* (Kel 11.8), one finds in the rabbinical literature the use of תורקין (PT Hag 2.2 72_d), which derives from the *thorax* and θώραξ (Krauss 1911, 315; Krauss 1948, 210).[4] The *Tosefta* provides an explicit reference to a seemingly leather armour (T Kel BM 3.1), possibly segmented in construction (p. 51). Only one direct reference to scale armour was made in the rabbinical literature. This paucity seems to be a yet further indication of the fact that the Jewish forces were poorly equipped with armour.

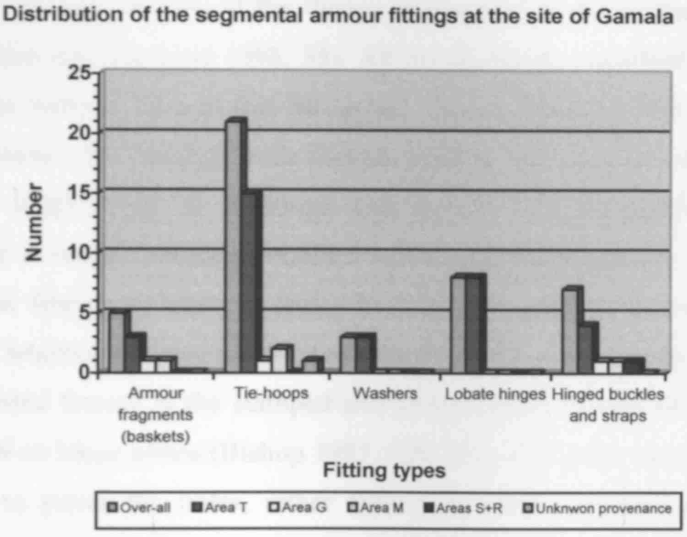
(a) Segmental armour

The Roman segmental armour appears to have had its roots in the Hellenistic and eastern traditions (Bishop 2002, 18-21).[5] Recently, a possible prototype was identified in Pergamon (TR) (*ibid.*, 18, 20). Segmental defences are attested in the east at Ai Khanoum (AF). Additional evidence for early segmental defensive equipment comes from Gamala, where a segmented thigh guard was unearthed in a second half of the 1st century BC context (Chapter 3 (iii)). The Roman segmental armour, commonly referred to as '*lorica segmentata*', has been the subject of several studies the most authoritative of which is that of Bishop (2002), accompanied by a catalogue (Thomas 2003). Thus, the following discussion aims to add the archaeological information from Palestine without repeating the information there embedded. In general, the plate armour was articulated on internal leathers, made up of four units: two upper units, each comprising a breastplate, backplates, upper shoulderguard and four lesser shoulderguards, as well as two lower units which consisted of six to eight girth hoop halves (Bishop 2002, 99-102). Several battle sites from the First Revolt have yielded remains of '*lorica segmentata*', all of which belong to the Corbridge type, and among which the most significant find is the panoply remains of the legionary L. Magus. The most frequent finds are copper-alloy fittings. Like in other military sites the prominent group are the tie-hoops. This bias in the archaeological repertoire is accounted for by the chemical reaction between the iron plates and the copper-alloy fittings – bimetallic corrosion[6] – that caused their weakening and ultimately detachment (Bishop 2002, 80; Bishop and Coulston 1993, 35 and note 8). Furthermore, the multipartite construction destined this type of armour to be prone to failure and more significantly from the archaeological point of view to the loss of parts. In addition, the archaeological record seems to suggest that in Palestine iron was more prone to corrosion with comparison to copper-alloy in the post-depositional process. At Masada, a lobate hinge,

[4] Krauss reads לסוטה as חלסטודות (ἁλισυδωτός) (*Lehn.* II, 318); *contra*: Sperber 1975.
[5] An additional source was the Sarmatian foe, although it seems to be later than the eastern examples.
[6] Also: galvanic or electrolytic corrosion.

three tie loops and two buckle hinge plates were uncovered, while a D-shaped buckle was found in the Jewish Quarter excavations and a tie-hoop at Samaria. An exceptional collection of armour fragments and fittings was made at Gamala: Plates fragments, 8 lobate hinges, three floral washers, 4 D-shaped buckles and 21 tie-hoops. Interestingly, the decisive majority (75%) of the '*lorica segmentata*' plates and fittings were unearthed in Area T – 34 of the reported 45 artefacts (see graph, below).[7] Whether this clustering reflects the course of the battle is hard to assess. Yet, an intense face-to-face battle, that had evidently raged in this sector, would have indeed produced such finds.

A possible evidence for a pair of vertical fasteners of the Newstead type (Thomas 2003, 89, Category G, Type iv) derives from 'Ein-Rachel, although as detailed below this identification is not at all conclusive.



The Corbridge type

Remains of the Corbridge Type were uncovered at Gamala, Masada, Samaria and seemingly Jerusalem. The largest collection has originated from the site of Gamala. In addition to the *lorica* of L. Magus (below), both fragments of plates and fittings were uncovered (fragmented plates, 1 lobate hinge, 2 floral washers and as many as 21 tie-hoops). Thirteen copper-alloy fittings of the Corbridge type from Gamala were recently analysed – 11 tie-hoops, 1 tie-hoop's rivet and 1 decorative washer. The composition of the fittings corresponds well with that of the western Roman examples (Ponting 2002a).

[7] This result is slightly diminishing the actual number, for the remains of L. Magus were considered as one item in the category of armour plates.

The plates

Our information concerning this feature derives mainly from the Gamala excavations. The assemblage from Gamala comprises fragmentary collar plates, backplates and shoulderguards. One near complete backplate unit of L. Magus's armour exhibits a sliding rivet mechanism (below). Very scant corroded remains of an iron plate still adhere to a lobate hinge from Masada (III.19/B.1).

The fittings

The Roman segmental armour is a multi-parts construction hence it was prone to varied attrition problems (Bishop 2002, 81ff). The following paragraphs details the varied fittings of the Corbridge-type from Palestine (components list: *ibid.*, 43-44).

Tie-hoops

The most represented element of the '*lorica segmentata*' in the archaeological record is the tie-hoop (Bishop and Coulston 1993, 35). All the tie-hoops unearthed in Palestine were hammered. For the western types of this fitting see: Thomas 2003, 91-108; Bishop 2002, 37-38, Fig. 5.6). However, the findings from Gamala indicate the existence of further types yet unattested. Many loops of the 21 tie-hoops were riveted. This strengthening element was intended to solve a rather common problem – the undesired opening of the loop. The dominance of this feature at Gamala seems to reflect a common convention among the attacking legions; whether this was confined to a specific force, at this point is hard to assess. A commonly attested feature is the stamped pair of concentric circles around the fastening holes, also attested on hinge plates (Bishop 1987, 120, 122). The latter may be the impression of the tool used to pierce the holes, rather than a decorative element (or alternatively a combination of the two?). As the hoops were made of a relatively thin metal and since the holes have been presumably executed at the last stage of production, there was a need to hold the small object very firmly or otherwise it would have been folded over during the piercing. It is why I suppose the repeating motif of double circles is in fact the reflection of the tool used for the piercing – a sort of a modern hole punch (**Fig. 6: 5**).

D-shaped buckle

Attached to either the top backplate or the breastplate of the armour, the D-shaped buckle is a rather common find in Palestine (Gamala (III.3/B.9-10), Jerusalem (III.10/B.1; III.12/B.1-2) and Masada (III.19/B.5-6)). This most probably accounts for its relatively flimsy construction. Manufactured of thin sheet of copper alloy and fastened to the suit through a hinge, the buckle is prone to detachment as a result of the pressures produced in battle. It is found hinged (Thomas 2003, 6-20) and detached (*ibid.*, 56-61).

Hinged straps

Corbridge type A armour included hinged straps (Thomas 2003, 21-32), two examples of which are documented at Gamala (III.3/B.11-12). The plates of the latter exhibit the commonly embossed concentric circles motif (see above).

Washers

To date, decorative washers are attested in Gamala alone (3 examples). Exhibiting the typical floral design it is difficult to differentiate between the washers that decorated the helmets' cheekpieces or '*lorica segmentata*' plates. Thomas has accrued evidence for 3 sub-types (Thomas 2003, 114-117, Type Ji-iii). An X-ray exposure of a plate fragment from Gamala demonstrates the attachment technique (**PL. III.3Q: 4**).

Lobate hinges

Several examples were found in Palestine – mostly in Gamala (III.3/B.7-8), while half a lobate hinge was found at Masada (III.19/B.1; **PL. III.19E: 4**). For the construction of the hinge consult the X-ray images of examples from Gamala (**Pls. III.3Q: 2, 4; III.3R: 2**). Interestingly, the remains of this panoply comprise several types of lobate hinges (two pairs and three halved examples). Two fully lobate pairs with no central fret are discernable (Thomas 2003, 65-71; Category F, Type iv; **PL. III.3Q: 1, 5**). Another half-hinge seems to belong to an intermediate type, akin to the 'Newstead' type (Thomas's Category F, Type viii; **PL. III.3Q: 3**), while crude rectangular plates (**PL. III.3R: 1, 3**) resemble the sub-lobate hinges of the Kalkrise-type fitting (Thomas's Category F, Type ii). This diversity seemingly reflects several repairs of the suit.

The armour of L. Magus

The examination of the photos of the finds *in situ* in L4019 indicated that part of the plates were complete and still attached upon discovery (**PL. III.3G: 1-2**). Unfortunately, they have been removed in pieces (**PL. III.3H: 1**), and are currently under going a process of conservation and restoration. Nonetheless, even in its present condition this find is of great interest, the unique technical traits of which go beyond the marked significance of the historical circumstances of its deposition. As no girth hoops were identified and neither tie-hoops are directly associated with this find, the remains appear to belong to the upper unit alone of the type known as Corbridge type (Bishop 2002, 31-45). This assemblage, which clearly belonged to one soldier, comprises what seems to be the right section of the backplates and parts of the shoulderguards. The composition of this find appears to strengthen our suggestion that the equipment was detached from a soldier that fell from an upper position down to the alley's floor. The parts that belong to the shoulderguards are evidently more

prone to detachment than the girth hoops, which were fitted more closely to the body of the wearer. The position of some of the lobate hinges indicates that part of the shoulderguards were bent and consequently detached seemingly following the fall of the soldier from the nearby roof.

Oxidized remains of the internal leathers are visible on the faces of several plate fragments. The near complete section of the backplates of L. Magus's armour is of particular interest. Bishop notes that 'one of the weakness of the Corbridge type of armour was the use of three overlapping backplates' and modifications were evidently made (2002, 43). He further notes that 'modern reconstructions of the Corbridge armour are also prone to this same problem'. Indeed, the order of the backplates of the Gamala specimen is reversed (**PL. III.3L: 1-2**), similar to the backplates fragment from Corbridge (Cuirass 5) (*ibid.*, Fig. 5.13). Moreover, a unique sliding loops device was observed on the inner side of the large fragment of three backplates, which replaced some of the internal leathering straps, the rivets of which are still visible. The three plates had on their back face four oval iron rings: 51mm long and 22mm wide. The flat rings, 2mm thick, slid upon flat rivets' heads. The circular heads of the rivets had the diameter of 12-14mm (**PL. III.3M: 1**). The principal device comprised of two loops and three rivets. Each loop was attached to two rivets, which in turn were fastened to two different plates (upper and bottom backplates). Every pair of loops was attached to one common rivet that was fastened to the third, middle, backplate. The central rivet, which had two sliding loops attached, formed a constraint upon the triple plates' movement, the maximum of which was: 15-20mm. No parallel is yet attested to this device in the Roman world, seemingly indicating the Gamala specimen was a local innovation. Sliding mechanisms are found upon medieval suits, and example of which is seen on the armour thought to have belonged to Wladislas King of Bohemia (*c.* AD1510), in the Wallace Collection, London (**PL. III.3M: 2**; Michael Bishop, *pers. comm.*; Bishop 2002, 81, 93).

Of the more fragmentary plates' remains we may note a fragment of a collar plate, with a turned-over rim (**PL. III.3O: 1**). The thickness of the plates is: 2-3mm. Some of the plates feature the typical cut corners, others were angular while examples of rounded corners are discernible as well (**PL. III.3O: 2-3**). The armour was decorated by circular floral washers, one example of which is discernable on the face of an armour plate just next to a lobate hinge, clearly identifying it as a shoulderguard (**PL. III.3Q: 3-4**). Two pairs and four single lobate hinges were associated with this suit. Most interestingly, the multiple forms of the lobate hinges that occur concurrently on the same armour indicate recurrent repairs. The two pairs are fully lobate, the volutes at the top present outside positions, yet with no central fret in the plate (Thomas's Category F, Type iv; Thomas 2003, 65-71) (**PL. III.3Q: 1, 5**). Of the additional four hinges, two presumably represent another pair which typologically belongs to

an intermediate type, somewhat similar to the 'Newstead' type (**PL. III.3Q: 3-4, III.3R: 3**). They feature angular volutes but lack the typical triangular fret (Thomas's Category F, Type viii). While the fourth hinge, which possibly reflects the last repair, is merely a crude rectangular plate that was fastened by four rivets – resembling the sub-lobate hinges of the Kalkrise-type fitting (**PL. III.3R: 1-2**). One pair of lobate hinges is bent upwards (**PL. III.3Q: 5**), in a very similar manner to lobate hinges from Chichester (UK) (Down 1978, 299, Fig. 10.36: No. 85Bi; Thomas 2003, 121: 7), Verulamium (UK) (Frere 1984, 35, No. 77, Fig. 11) and Rheingönheim (DE) (Ulbert 1969, Taf. 33: 4 and 7). The upwards bending of the shoulderplates possibly reflects the fall of the soldier from an elevated surface (*cf. BJ* 4.23).

At least three plates' fragments exhibit what appears to be battle damage (**PL. III.3P: 3-4**). These severe dents are similar to the patterns of damage visible on the Bank of England breastplate and the mid-collar plate of Cuirass 4 from the hoard of Corbridge, which have been suggested as reflecting the impact of substantial blows (Bishop 2002, 83-84, Figs. 9.7 and 9.8). The bent-over edge of the backplate seems to have accounted for the collapse rather than battle damage (**PL. III.3L: 2**). Further battle damage was observed on the brow-guard of L. Magus's helmet (**Pls. III.3D: 2; III.3E: 1**).

The Newstead type

During the first half of the 2nd century AD the Corbridge and Newstead types of armour were concurrently used, as the finds from Carlisle and Carnuntum indicate (Bishop 2002, 49). Following this transitional period the Newstead type became the dominate form, throughout the 2nd century and first half of the 3rd century AD (*ibid.*, 46-51, 54-59). No remains of segmental armour were yet discovered in Second Revolt contexts. In fact, to date no remains are attested later than the First Revolt, at Masada (AD73/4). In the east, there is as yet no indication for the employment of this type in the mid-3rd century. In the excavations of Dura-Europos (AD254) no remains of '*lorica segmentata*' have been reported. Two copper-alloy fittings from the excavations of the Roman Fort of 'Ein Rachel (**PL. IV.6A: 4-6**), dated between AD9-106, appear to be pendants rather then the decorative elements that enclosed the holes for the vertical fasteners of the Newstead type of the breast- and backplates (Thomas 2003, 89, Type Giv). Despite sharing the peripheral dotted decoration typical of the Newstead fittings (Robinson 1975, Pl. 487), the outlines and the upper recess as well as the early date points to the conclusion that they cannot be identified as vertical fasteners.

*(b) Scale armour (*lorica squamata*)*

In the Bible we explicitly read about the use of scale armour – שריון קשקשים (*cf.* 1Sam 17.5; Yadin 1963b, 196-197). The relevance of the biblical examples lies in the emphasis of

the long lasting tradition of the mid-ribbed scales, which dates back to the Late Bronze age (*c.* 1550-1200BC), right through to the Roman period.

The mid-rib is a very prominent feature in the structure of scales from Palestine, in distinct contrast to the situation in the west, where the mid-rib is very rare and appears mainly on sculpted monuments.[8] This element contributed to the strength of the scale, especially in the case of copper-alloy scales (particularly brass). In addition, the mid-rib provided an enhanced adjustment for the overlapping scale with its adjacent scales (an adjustment that theoretically may have reduced the pressure from the linking wires and in the long run diminished the attrition of the suit). The mid-rib is typical to the late 1st century BC – 1st century AD and seems to have disappeared by the 2nd century, as none of the Second Revolt scales exhibit it (below).

Turning to the evidence of the large fragments of scale armour, a single complete scale armour was unearthed at Sepphoris (III.6/B.1). During the excavations by South Florida University, headed by James Strange, three skeletons of dogs were found buried above an iron *lorica squamata* suit, dated to the early Roman period. No explanation may be yet determined with certainty regarding this find. From a functional point of view the association of the armour with the canines' corpses may hint for intended concealment. On the other hand it is tempting to associate this burial with that of a military dog ('*canis militaris*'). But whether the associated *lorica* hint at the hounds' function is hard to assess on the basis of the available evidence. The dog is a Roman death symbol, further representing healing traits. Burial of dogs was recently associated with the worship of Askelepius (Halpern 2000), but I could not find any reasoning for the presence of armour. Unfortunately, the corroded condition of the ferrous scales prevents us from providing any details concerning its shape and its construction beyond that of the single scale (Type 13) and it being made of rows. Iron scales of this type were found in a Second Revolt context in the Hebron hoard and at Tel 'Azeqa. Hence, a 2nd century AD date may be offered rather than the general date of 'early Roman period' provided by the excavators. The weight of the folded armour is 3.571kg (*cf.* mail: p. 48).

A presumably complete segment was found in the fields near Legio (V.3/B.1). The latter consists 13 lines of scales (2 lines of Type 9 and 11 lines of Type 8) and appears to be a collar or shoulder-piece. It is very similar in shape to the collar segment of Sarmatian scale armour (Negin 1998, Pl. 6). Interestingly, the segment from Legio consisted of two types of scales, the small type of which was apparently used for the external rows. Two types of scales were also used in the construction of the armour suit from Tel 'Azeqa (V.11/B.1).

[8] Leander Touati 1987, Nos. 25, 37-38, 42, 70, 80.

The body of the scales from Tel 'Azeqa is slightly domed (V.11/B.1), a trait also attested at Gamala (III.3/B.41-42; **PL. III.3V: 1-2**). This phenomenon is well documented in the west (Robinson 1975, 154, Pls. 436, 439, 441), and appears to have had structural advantages. This structure enhanced the strength of the scales. In addition, enlarging the surface of the armour suit, it seems that the bumpy, turtle-like face would have helped to divert arrowheads upon impact and deflect blows.

No breastplates or joining fittings were found in Palestine. Nonetheless, motifs from the grammar book of the *lorica squamata* breastplates appear to be the inspiration if not the direct source for the ornamentation of Roman lead coffins in Palestine (**Fig. 6: 1-3**). Near identical images of Mars Ultor, Minerva, Victory, Capricorn and an eagle set in the typical cabled border of the breastplate, adorn three lead sarcophagi from Palestine (Rahmani 1999, 20, 54, 62, Figs. 26, 156-158 and 179), which were all manufactured in Jerusalem (*ibid.*, 104, 105-106, Nos. 60, 64 and 68). The trend towards a breastplate frame was observed in 1932 on a coffin from Istanbul (TR) (Müfid 1932, 436, Fig. 18). These Jerusalemite coffins date to the first half of the 3rd century AD and to the mid-3rd century or slightly later. The choice of motifs indicates that the Jerusalem artisans made an effort to cater to the military taste, which seemingly reflects the evident importance of the army and its veterans in *Aelia Capitolina* (Rahmani 1999, 68, 69, 80).

The *Babylonian Talmud* described the heavy Persian cavalrymen clad in שריון קליפה (*shiryon clipa*)[9] (Sanh 75_b), seemingly scale armour of the *cataphracti* (BB 9_b; *Jalk* 478), which are explicitly noted in a *Midrash* of the late Roman period – קטפרקטוס (*katafraktos*) (*Song R* 1.9) and also compare to the specimen of horse armour discovered in Dura-Europos (James 2004, 113-114).

Scales types

Scales in Palestine were made both from copper-alloy and iron. According to the *Midrash*, Idumean rebels were clad during the First Revolt in golden scale suits – (*S*)*TRQI* [(ס)תרקי] (Liberman 1994, 182-183, note 187), resembling a report of a Persian cuirass (Herod. 9.22).[10] A prominent factor that distinguishes the Roman east from the west is the dominance of the copper-alloy scale. For example, from the *c.* 1090 scales documented at Masada one scale alone is made of iron (1056-801/5; weight: 2.15gr). Although somewhat a generalization, in light of the limited pool of evidence, the ratio between iron and copper-alloy scales in Palestine differs dramatically from that of the west, where ferrous scales seems

[9] The term קליפה is seemingly borrowed from *clipeus*, which in addition to the round anachronistic shield designated a disc or a medallion, hence the fastening of the scales to each other formed the armour.

[10] *Sifre Zuta* ed. Epstein, Tarbiz I, fasc. 1, p. 70_{17}.

to be more frequent than copper-alloy examples (Von-Groller 1901, Taf. XV). A recent archaeometallurgical analysis of scales from Masada indicated that they were made of three types of metal: Brass, un-alloyed copper and tinned copper (Ponting and Segal 1998; Ponting 2002a, 564).[11] Scales from Masada were tinned (Maddin, Muhly and Stech 1983), a treatment which in addition to decorative merits contributed to the preservation of the scales (below).

The large assemblage of scale from Masada sheds new light upon the production process of the embossed scales (mainly Types 1 and 2). It seems that the brass sheet was divided into long sections, while each of the dividing lines consisted in fact of two ridges. Two embossed copper-alloy bands, with double ridged edges appear to be unfinished scales (8-197/51 and 9-263/74; **PL. III.19C: 3-4**). The gutter between the two ridges allowed the scales to be more easily cut from the sheet (16-161/19; miss punched: 8-196/16). Some of the scales were not so finely cut, still exhibiting the remains of an extended flange (**PL. III.19D: 1**).[12] It was seemingly than that the mid-rib and holes were respectively punched. One scale was found with a double mid-rib (8-197/3) (**PL. III.19D: 2**). Another scale bears signs of two consecutive hammerings (8-188/13; **PL. III.19D: 3**).

The archaeological record shows variations in the length and place of the mid-rib along the longitudinal axis of scales:

a. Mid-rib that runs along the entire scale length (Types 1 and 3)
b. Mid-rib that occupies the lower section of the scale (Types 1 and 3)
c. Mid-rib that occupies the upper section of the scale (Type 1)
d. Mid-rib that occupies the mid section of the scale (Types 1 and 2)

Many of the Type 1c scales have a very distinct mid-rib with T-like and Y-like terminals (16-161/25, 19; **PL. III.19D: 3-4**). The regularly straight and thin mid-rib of Type 3 has a variation, of a somewhat elongated triangular shape, presumably a reflection of careless production. The fastening holes of Types 1a and 1b were spaced on both sides of the mid-rib, while the holes of Type 1c occupy the centre of the scale above the mid-rib.

Beyond the factors of material and size, the typology of scales focuses mainly upon the arrangement of the fastening holes and their location; see for example the typology of the Carnuntum's scales (von Groller 1901, 84ff, Taf. XV). All in all, I have defined 15 types of scales in Roman Palestine, detailed below. To begin with, this list enables us the comparison with other assemblages from provinces within the empire and beyond its limits. Rare types, like the Type 12, may serve at times as indicators of foreign influences. Moreover, such a classification enhances our knowledge in three overlapping categories: chronology,

[11] Ponting ignores a former study: Maddin, Muhly and Stech 1983.
[12] See: 9-263/7 (illustrated); 8-197/77, 41; 8-227/11, 26; 16-161/30, 9, 18, 19; 16-296/10, 16, 20, 21.

production and use. The examination of the inventory of types on the background of related context and chronology clearly suggests that several scale types were typical of certain periods of Palestine, thus providing us with a further aiding criterion for dating. A general overview of the assemblage appears to shed light upon the evolution of designs through time. The latter observation is of particular significance as specific designs appear to reflect production trends and changes, like the tendency towards a more rigid and more resilient suit of scale armour to missiles' penetration in the 2nd century AD. This typology, particularly among the large assemblage from Masada, reflects the stages of the production process. The variations of the same type of scale that are discernable among this group of Herodian spare scales is strongly suggestive of a co-existence of several craftsmen. They were seemingly using slightly different punching tools as emerges from the noticeable diversity of mid-rib patterns. On top of this, several types may be clearly assigned to particular parts of the cuirass, as demonstrated by the finds from Legio (V.3/B.1) and 'Azeqa (V.11/B.1). Lastly, this typology reflects the prominent place of copper-alloy in the production of scales in Roman Judaea, as discussed above.

Copper-alloy scales

Type 1 (a-d) Long with embossed rim and mid-rib, 4 small attachment holes in the upper centre

Type 2 Short with embossed rim and mid-rib, 4 small attachment holes in the upper centre

Type 2a Short with embossed mid-rib, 4 small attachment holes in the upper centre

Type 3* Large with embossed mid-rib, 4 small attachment holes in the upper centre

Type 3a* Long with embossed mid-rib, 2 small attachment holes in the upper centre

Type 4 Short with embossed mid-rib, 4 small attachment holes in the upper centre

Type 5 Very short with embossed mid-rib, 3 small attachment holes in the upper section

Type 6 Short, 3 pairs of small attachment holes in the upper centre and both sides

Type 7 Large, 4 pairs of small attachment holes in the upper centre and two pairs of lateral holes

Type 8 Long, 4 pairs of small attachment holes in the upper, lower centre and both sides

Type 9 Medium, 1 large central upper attachment hole and two pairs of lateral holes

Type 10 Short, 6 small attachment holes (3 pairs) along the upper section

Type 11 Double scale

Iron Scales

Type 12 Large scale – *cataphracti*?

Type 13 Short with embossed mid-rib, 3 small attachment holes in the upper part

Type 14 Long with embossed mid-rib, 4 small attachment holes in the upper centre and two pairs of lateral holes

Type 15 'Bottle-neck' scales – 'tasses'

* Types 3 and 3a, that were uncovered at Masada, exhibit the same arrangement of the fastening holes as types 1 and 2, but of a cruder design.

In all the unearthed fragments from Palestine, which consist of more than one scale, the scales overlapped their neighbouring scales from the left. The scales were seemingly fastened to a fabric backing (Bishop and Coulston 1993, 141), examples of which are known from Dura-Europos (James 2004, Nos. 438-439, 443-445)[13] and Carpow (UK) (Coulston 1992).[14] The early types (Types 1-4) were based upon the simple fastening of two pairs of holes, each to the adjacent scales, thus creating single rows (**PL. III.19D: 5-12**). The fact that the rows were not connected to each other, and the scales were fastened only by their upper part resulted in a relatively flexible armour suit, however with an evident vulnerability to missiles hitting between the rows. The only two examples from the First Revolt that deviated from this arrangement, had in addition to the 4 central holes two pairs of lateral holes (see: **Pls. III.3V: 4; III.19C: 2**). This arrangement further appears on Type 7. The upper four holes were now used for sewing the scale to the undergarment, while scales were attached to each other through the lateral holes (Type 14). Interestingly, in the case of the pair of the attached scales from Gamala, the mid-rib was not used as a divider as the edge of the over-lapping scale does not reach it, confirming the notion that the prime function of the mid-rib was as a strengthening feature. The scales types that date to the 2nd century AD and the Second Revolt completely adopted the change in the arrangement of the fastening holes, and several variation are attested, ranging from copper-alloy and iron examples of Type 14 to the least flexible combination of 4 pairs of small attachment holes in the upper, lower centre and both sides (Type 8). The large central upper attachment hole of Type 9 was intended for lacing, possibly of a thicker leather band.

Type 5 is dated to the First Revolt, and exhibits 3 holes (pp. 49-50). It seems that the two lateral holes were used for fastening to the neighbouring scales, while the central hole was utilised for its attachment to the under garment – the mail. The same arrangement, but with 3 pairs of holes, was still in use in Palestine (Tel Megiddo) during the early 2nd century AD (Type 10).

Type 11, which features a double curving bottom, is very rare. Whether arising from a fault in production (below) or being intentionally manufactured as such, the single example from the Site of 'Bypass Shoham' (**PL. V.10: 2**; V.10/B.1) has a parallel in Mainz (Behrens 1913-1914, 67-68, Abb. 2.1).

[13] Scale horse armour 1, limb defence 8, greave liner.
[14] Leather as an undergarment is reported from Vindonissa (Bishop 2002, 65).

Like all typologies there are exceptions. The upper rims of not a few scales of Types 1 and 2 are not embossed; were these scales cut from the upper-most part of the brass sheet? Although Types 1-4 have as a rule 4 attachment holes, some scales exhibit variations:

1. Type 1 with a fifth lateral attachment hole in the lower right lower part.[15]
2. Type 1 with a fifth lateral attachment hole in the centre right.[16]
3. Type 1 with a fifth attachment hole in the lower centre.[17]
4. Type 1 with only one pair of attachment holes.[18]
5. Type 2 with a fifth lateral attachment hole in the lower right lower part.[19]
6. Type 2 with a fifth central upper hole.[20]
7. Type 2a with three pairs of attachment holes.[21]

Among the embossed scales of Masada there is evidences of faulty production: One instance of a scale with a pair of mid-ribs (8-197/3) (**PL. III.19D: 2**); the rounded bottom and the mid-rib of a scale Type 4 were mis-hammered (16-161/26); missed punches in which the mid-rib is oblique and off centre are documented (8-188/1, 2, 32; 8-196/40); another scale (9-263/30) had only its left-side rim and mid-rib embossed, whereas the right perimeter was left flat (**PL. III.19D: 15**; also 9-263/34 and possibly 8-197/17). The punching of the holes was not always very accurate, as quite a few holes are not aligned, while others were too close or far from their counterpart holes or double-punched (**PL. III.19D: 8, 14**; 8-197/2, 9-263/32, 9-269/95, 10-304/21, 16-296/21).

Typology may be useful in the dating of un-stratified scales. The iron scales from Tel 'Azeqa, which originated in an unclear context can be safely dated to the Second Revolt due to the similarity to the iron scales from the Hebron hoard (Type 13). Indeed, hiding complexes from the Second Revolt were reported from Tel 'Azeqa. However, one must rely on the archaeological context, for the evidence of the typology is not always conclusive.

A Second Revolt date may also be assigned to the find from Sepphoris, although one can suggest an earlier date compared with the similar copper-alloy scales from Gamala (Type 7). The copper-alloy scales of the suit from the Judaean Desert (Type 8; VI.2/B.1) are identical to those which comprise most of the complete segment from Legio (V.3/B.1), thus similarly dating them to the period of the Second Revolt.[22]

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[15] 8-196/3; 8-197/62; 9-263/2; 9-282/9, 14; 10-304/4; 16-161/29, 30.
[16] 8-196/1; 8-197/45; 9-263/20; 10-304/4.
[17] 8-196/25, 32, 34 (?); 8-197/46; 16-161/31.
[18] 16-296/20.
[19] 16-184/11.
[20] 16-161/27; 9-263/20.
[21] 8-197/7; 8-227/27.
[22] Scales are reported from Khirbet-el 'Aqd' (Kindler 1984, 172). However, no further detail concerning their nature was available.

Scale plating

The scales unearthed in the Lower Terrace at Masada exhibited a variety of colours: brass and silvery appearance (*cf.* Sil. Ital., *Pun.* 5.140-143). The alternating colours of the scales from Masada were the theme of an archaeometallurgical analysis (Maddin, Muhly and Stech 1983). The idea standing behind the use of changing colours on the same cuirass is neatly embodied in the above citation. The finds from Ham Hill (UK) (Haverfield 1906, 296) and Augsburg (DE) (Robinson 1975, 173), of scale armour with alternating arrangement of colours seem to indicate that the variation of the Masada specimen may have been intentional (*ibid.*, 156). Robinson further suggested that scales' plating with white metal (silver or tin) had, in addition to the ornamental merits, also functional reasoning. The plating of scales would have prevented the ill effects of corrosion in damp conditions (Robinson 1975, 156). If indeed so it would have reduced the required maintenance time.

Attrition wear

Damaged scales appear to reflect daily attrition. The excavators of Tel 'Azeqa report that: 'in two fragments the edges have been turned over so as to prevent them from cutting' (Bliss and Macalister 1902, 150). Their conclusion was that: 'These, in all probability, are portions of the collar' (*ibid.*). However, it appears that the bending of the scales' tips and edges were the result of the constant contact with the suspended equipment (such as the sword's handle) (**Fig. 6: 4**), a damage pattern that is visible on modern suits of *loricae squamata* (Croom 2000, 130). This kind of damage is typical of the more rigidly attached scales.

The more 'loose' fastening method was prone to the danger of scales' detachment; hence, the need for replacement of scales was constant. It seems that most of the finds of single scales and small segments of scale armour represent a loss due to attrition (*ibid.*, 130-132); that is the scale from Kalandia (III.8/B.1), the examples from Gamala (III.3/B.40-41) or the finds from Tel Megiddo (V.4/B). Failure of the fastening wire or the wire that attached the scale to the backing could have result in the dropping of one or a line of scales. As noted above the stocks of scales from Masada were seemingly intended to be a cache of spare scales for the replacement of missing or damaged scales.

*(c) Mail armour (*lorica hamata*)*

Ring mail was apparently used by the Hellenistic infantry (1 Macc 6.35). The author of the apocryphal composition notes the term *ἁλυσιδωτοῖς* which means 'made of chains/rings'

(Bar-Kochva 1989, 313-315).[23] An analysis of the historical sources indicates that the Roman army adopted ring mail from the Galatians and in turn later inspired the Seleucid army (*ibid.*, 313). In the Hellenistic east, this type is depicted at Pergamon (Robinson 1975, Pl. 459).
In the Roman period mail was used by legionaries, but more extensively by auxiliary soldiers (*ibid.*, 164-173; Coulston 1988c, 222-230). Made of copper-alloy or iron rings, the *lorica hamata* appears to be inferior to segmental armour and possibly to some types of the *lorica squamata* in protecting against thrusting blows and missiles, yet it was presumably good in defending against slashing blows. The absorbing nature of its construction required the wearer of the mail to wear a padded undergarment.

No literary evidence is known from Palestine concerning the employment of ring mail. A possible single representation of a mail shirt, although with a gladiatorial connection, was depicted in a cave at Tel 'Eitun (**Fig. 11: 2**; Coulston 1988c, 223ff).[24] One complete iron mail and minute fragments of two more iron examples were found in Palestine. During our excavation at the breach point at Masada, a small fragment of mail was unearthed, dating in all likelihood to the very final stage of the Roman siege (AD73/74). The employment of *lorica hamata* during the First Revolt is further confirmed by additional fragments from the Upper City of Jerusalem (AD70), coated by small scales (III.12/B.3; B.5.1 – below). The much corroded state of preservation negates us from attaining any details regarding the mail's construction. The employment of mail during the Second Revolt is testified by the discovery of a complete example, as part of the hoard from Hebron's environs (**PL. V.31D: 1**). The mail that was found rolled-up, had presumably been stored inside the infantry helmet (pp. 262). It was discovered in direct association with a row of iron scales (**PL. V.31C: 3**), some of which still adhere to the interior of the infantry helmet (**PL. V.31C: 2**). The hem of the mail was sometimes supplemented with triangular and tongue lappets that appear to have had ornamental rather than protective merit (*apud* 1988b, 225-228). The extending of the garment contributed to the shielding of the wearer. It seems that short *pteruges* edged the mail (Trajan's Column: scene LXXII) or its undergarment (*apud* 1988c, 227-228). The Hebron hoard shirt was in all likelihood edged by at least one row of iron scales, like those which are visible for example on the Adamklissi monument (notably Metope XLI – Richmond 1967, Pl. XIXb). Scales were attached to the hem of composite armour garments used by Sarmatian *cataphracti* in the mid-1st to early 2nd centuries AD (Negin 1998, Pl. 6).

Since it is impossible to unfold the shirt due to corrosion, one cannot provide details as to its shape and even its hem, a not unknown phenomenon (Robinson 1975, 171; Croom 1997-

[23] Bar-Kochba raises the possibility that the author followed the mistaken translation of the Septuagint to 1Sam 17.5, which in fact refer to scale armour (1989, 313-314).
[24] The uncertainty derives from the fact the incision represents a *retiarius*, who is regularly depicted semi-naked rather than clad in body armour.

98, 57). Unfortunately, the original weight was not recorded. Furthermore, one must take into account that the conservation process involved its soaking in epoxy resin, which added much extra weight. The shirt from South Shields (UK) is reported to weigh 5.440kg, while the specimen from Wallsend (UK) weighs 5.788kg (*ibid.*, 59).[25]

My scrutiny under a microscope indicated that no riveting was involved and the rings were welded. It seems that each ring (1.5-2mm thick) interlocked with four others (**PL. V.31D: 2**), a well-attested construction technique (*ibid.*, 57-59). The shoulders of the mail wearer were commonly reinforced by shoulder-pieces, an element that formed part of the Hebron shirt as well. Like with the '*lorica segmentata*', special attention appears to have been devoted to the provision of added protection against slashing sword blows (Goldsworthy 1996, 220-221). One explanation for this tendency is the sword fighting technique of the Roman's opponents, which used a cutting movement rather than thrusting. The shoulder-pieces were commonly held together by hooks (Robinson 1975, Pls. 459, 461-462, 472, 480, Fig. 176) and were similarly used with the shoulder-pieces of the *lorica squamata* (*ibid.*, Pls. 450-451). The hooks were fastened to a small central device, which commonly had the form of a small metal disc. At times, the size of this element was *c.* 50mm in diameter, like on the Iron age mail from Kirkburn (UK) (Stead 1988, 115), and compare with the 1st century BC sculpture of a Celtic warrior from Musée Granet, Aix-en-Provence (FR) (Robinson 1975, Pl. 462). A flat iron disc, previously unnoticed, is corroded to the shirt from the Hebron hoard (**PL. V.31D: 1**). The slightly doomed object has the diameter of exactly 50mm and formed the central part of the fastening device, the corroded remains of which are seen in two antinodes points around its perimeter. Its existence seems to indicate the presence of the extra protection of the shoulder-piece.

A possible additional fragment was recently reported from Iksal (1807/2320) in the north of Israel (Makary 2003, Fig. 43). A tomb that was used between the 1st and the 6th century AD contained what was described as a 'bracelet', made up from interwoven copper-alloy rings, which in fact appears to represent a fragment of a mail. Unfortunately, a more accurate dating is unattainable.

(d) Composite and hybrid forms of armour

The need for hybrid form of armour is intriguing. Its existence may be elucidated according to ornamental or functional approaches. Robinson proposes to identify this type with the so-called '*lorica plumata*', a 'posh' type of armour that was a composite form of mail coated by scales (Robinson 1975, 173). The later technical approach underlines the

[25] The shirt from Bertoldsheim (DE) that weighs 3.496kg is presumably incomplete, although it presents similar figures with the scale armour from Sepphoris (3.571kg).

utilization of both types of armour advantages, thus providing an enhanced protection. It seems likely that practical factors were also behind this design other then just the craving for a flamboyant appearance. Massey's experiments of shooting reconstructed arrows at replicas of Roman armour have proven that the *lorica hamata* was the most penetrable type of cuirass, followed by the *lorica squamata* and the '*lorica segmentata*' respectively (Massey 1994). Interestingly, his experiments revealed that penetrating the ring mail, an arrow would at times get locked into place by the damaged rings (*ibid.*, 37). This would have no doubt complicated the arrow extraction. In light of the above, the plating of mail armour by scales appears to be, in addition to the showy effect, a very practical enhancement. If this delicate scale was indeed applied upon a mail, one would be able to dismiss the notion which find this type of scale as children's armour (von Groller 1903, 105, Fig. 46) or 'hardly suitable for use in war, but they may have formed part of a lorica squamata for cavalry sports wear' (Robinson 1975, 154; below).

The direct source of influence may have very well been gladiatorial equipment, which commonly consisted of such combinations. The representational evidence appears to demonstrate that these combatants were clad in hybrid forms of armour – as in a recent example from Alba Iulia (RO) (Coulston 1995; Bishop 1999/2000). The schools of gladiators reflect the more remote circle of influence: neighbouring countries. A combination of mail and scale armour, like the one that is hereby discussed, possibly came to Rome through the Sarmatians, the *cataphracti* of which were clad in composite cuirasses that consisted of mail and scale armour, which themselves were influenced from Scythian armour (Negin 1998, Pls. 5: 1-2, 6).

*Mail and scale armour ('***lorica plumata***')*

In the excavations of the Jewish Quarter at Jerusalem two small fragments of hybrid armour were unearthed: an iron mail that is coated by small copper-alloy scales (Type 5) (**PL. III.12: 2-3**; III.12/B.3). The iron components are too corroded for determining whether the rings were riveted or butted. The scales are 10mm long, with a mid-rib and a series of three link holes across its upper part. Pin-pointedly dated to the destruction of the Upper City on the 8th of *Elul* AD70, this armour belongs to a group which at times is referred to as '*lorica plumata*' (Robinson 1975, 154, 157). Examples of such a combination are documented in 1st century AD date at Ausburg (DE) (*ibid.*, 173, Pl. 484), Ouddorp (NL) (*ibid.*) and Newstead (UK) (Curle 1911, 161, Pl. XXXVIII, Fig. 8; Robinson 1975, 173, Pl. 481 – upper), although the western examples exhibit 3 pairs of holes.

Small scales with multiple upper link holes, commonly six (three pairs), are known in the east at Tel Megiddo (V.4/B.4) and from Dura-Europos (Clemetson 1993, 9). They are further

reported in the Roman west from: Corbridge (UK) (Anstee 1953; Robinson 1975, 154, Fig. 162, Pl. 439; Clemetson 1993, 8-9); Caerleon (UK) (Clemetson 1993, 9, note 7), Great Chesters (UK) (Allason-Jones 1996, 193, No. 37, Fig. 10), Vindobona (AU) (Neumann 1967, 54, Taf. XXXVI, 1) and Carnuntum (AU) (von Groller 1903, 103, Fig. 47). The table below details the traits of this type.

Site	Material of mail	Material of scales	Shape of tip	Medial rib	Length of scales	Width of scales	Diameter of links	Date
Ausburg	Copper alloy	Copper alloy + Iron	Flat	+	10mm	7mm	?	1st cent. AD
Newstead	Copper alloy	Copper alloy		+	10mm	7mm	5mm + 3mm	
Ouddorp	Copper alloy	Copper alloy		+	11mm	6mm	3mm	
Jerusalem	Iron	Copper alloy		+	7mm+	3mm	3mm	AD70
Caerleon		Copper alloy	Tapering		17mm	9.5mm		
Great Chesters		Copper alloy	Tapering		11mm	6.5mm		
Vindobona		Copper alloy	Tapering		14mm	10mm		
Carnuntum		Copper alloy	Tapering		14mm	8mm		
Dura-Europos		Copper alloy	Tapering		9mm	6.5mm		AD256
Tel Megiddo		Copper alloy	Rounded					2nd cent. AD

As far as function is concerned, these scales were interpreted as part of a sport scale armour (Robinson 1975, 154, Pl. 439), or neck guard (Allason-Jones 1996, 193, No. 37); the latter suggestion, which assigns the scales to a part of the protective wear rather than part of an entire cuirass seems to me more likely, as the use of several thousands of such scales appears to be impractical and is not yet attested as such in the archaeological record – the largest fragment is the Augsburg example which does not exceed 250mm in length.

(e) Leather armour

According to Tacitus the Sarmatians were employing what may be interpreted as leather constructed armour: '*praeduro corio consertum*' (Tac. *Hist.*, 1.79.3). In the east, two leather cuisses are reported from Dura-Europos. Their construction was previously asserted to reflect

a version of the lamellar armour, but is now thought to accord more with Roman scale armour (*apud* 2004, 113; Nos. 441-442, Figs. 65-67). Interestingly, the *Tosefta* indicates the employment of leather protective gear in Palestine. The Sages discuss the criteria for declaring armour (*shiryon*) as pure: 'When is its purification? When it will be worn out (בלה) and no longer serves its original function. [If] it wore out...' (T Kel BM 3.1). The use of the Hebrew term בלה (*balah*) = wore out, seems to indicate that the armour was made of leather. This armour, according to the *Tosefta*, that was divided lengthwise is considered clean for it no longer served its original function, while being divided breadthwise it could have still practically served as armour. It may be suggested that the subject of the ruling is segmental armour, like the one that is depicted on the tombstone of Severius Accepteus (Coulston 1990, 142, Fig. 2). However, the rows-based construction of the Duranic cuisses may identify the *Tosefta* narration as such. The use of the word smelt in the *Tosefta* could be explained by the scale-coated cuisses from Dura-Europos (James 2004, Nos. 443-445).

Although this ruling follows a discussion about *militaria*, one should not overrule the possibility that it refers to non-military equipment, in view of the fact that during races Roman charioteers utilised leather protective dress made of leather lacing or straps (Junkelmann 2000c, 92, Figs. 101-105, 109, 114).

(f) Muscle armour

The Roman muscle armour bears the evident fingerprint of Greek and Etruscan influence (Richardson 1996). Since a very early stage it became a symbol of Roman sovereignty and was adopted by the emperor, high-ranking officers and even soldiers (Robinson 1975, 147-152). A common element in the imperial propaganda, this armour appears on statues from Caesarea (**PL. IV.1: 2**), Samaria (**PL. VI.8: 1**), and Scythopolis (**Fig. 7: 1**; IM 1992). One of the shoulder-straps of the latter example (2nd century AD) is erroneously presented, as its right-angle cut-out is featured inside rather than outside. A celebrated copper-alloy example was found at Tel Shalem (V.2; Foerster 1986). Nonetheless, recently it was argued that the Hadrian sculpture is in fact a pastiche of an imported head of Hadrian that was placed upon a Hellenistic torso of an oriental origin (Gergel 1991). Gergel offers several possible contexts for the production of the torso, like the reign of Antiochus IV Epiphanes (175-164BC), the Pompeian conquest of Judaea or as late as Herod's rule. The latter was reported to place trophies on the theatre in Jerusalem (*AJ* 15.272).[26] An additional, unpublished, fragment of such armour was found at Calgouia – Mo'a (IV.4/B.1). It is a well-preserved single copper-

[26] *Cf.* 1 Macc 13.29.

alloy flap of a cuirass (lambrequin), with its typical curving design and terminating fringes. Parallels are known throughout the Roman world (Boube-Piccot 1969, Pls. 38, 54).

(iii) Limb defences

The analysis of the skeletal remains found in Maiden Castle and Wisby indicated that the limbs are most vulnerable part of the warrior's body in face-to-face combat (Goldsworthy 1996, 219-221). The limbs that were in immediate danger were the right hand and legs (mainly the left leg which was closer to the enemy). The standard protective Roman gear included a helmet, armour that covered the torso and shoulders and a large shield. This principal panoply left the above noted limbs exposed and prone mainly to slashing injuries. Well-protected as he was the Roman soldier was far from being invulnerable. An occurrence during the siege of Jerusalem illustrates the dangers that faced the armoured Roman soldier. In the course of Titus's assault on the city, an auxiliary soldier, named Sabinus, was the first to scale the wall of Jerusalem. Slipping over a rock he found himself isolated facing a contingent of Jews. 'Rising upon his knee and screening himself with his buckler', writes Josephus, it was only after his right arm was paralysed, due to the numerous wounds inflicted, that Sabinus was eventually overpowered (*BJ* 6.63-66).

The emphasis on shielding the limbs that was common during the republic, declined in the early Principate only to be revived again in the early 2nd century AD. Other than merely fashion trends, these changes were associated with the enemies that the Romans encountered (Robinson 1975, 186; Goldsworthy 1996, 221). The protective elements follow two types of construction: articulated plate guards (below – C.1) and solid guards (C.2). Although most of the reported protective devices were made of metal, there was apparently a wide use of leather and cloth elements, for padding and as defences in their own right. Such protective equipment was frequently employed in the gladiatorial games (Junkelmann 2000a), while a leather thigh guard is known from Dura-Europos (James 2004, 113, Nos. 441-442).
In the following paragraphs I will examine the evidence for the employment of limb defences from Judaea of the late 1st century BC – early 2nd century AD; a period of particular interest, being a transitional stage in the history of this type of armour.

(a) Articulated plate defences

The use of laminated plate limb defences is documented amongst Hellenistic armies. The weapon frieze reliefs from Pergamon (TR) depict laminated armguards that were presumably part of the muscle cuirass (Bar-Kochva 1980, 22, 43, 189). According to Bishop, fragments of Hellenistic iron laminated armour from that site may be the prototypes of Roman laminated armour (2002, 18, 20, Fig. 3.4). A thigh-defence was unearthed in 'Ai Khanoum (AF) (Bernard *et al.* 1980, 60-63, Pl. XXXVIa), as well as an armguard (*ibid.*, 452-457, Fig. 11; Bishop 2002, 18, Fig. 3.3).

Thigh guard

The Near East had a prolonged tradition of laminated armour, the employment of which was very developed among the armoured cavalry of the Parthians, which also influenced the Sarmatians (Robinson 1975, 186). A depiction of thigh-guards is found on a *denarius* of Augustus from 20BC, in which a Parthian is seen returning one of the legionary standards lost by Crassus (**Fig. 8: 1**). The thigh guard was of great value to the cavalryman, protecting his most vulnerable upper thighs (Bishop 2002, 73-75). A rare example of a thigh guard from the second half of the 1st century BC was found at Gamala (III.3/C.1; **Figs. 8: 2; 9: 1-2; 10: 1**). Unfortunately, gathered in fragments, it is currently undergoing a strenuous process of conservation, cleaning and mending. Thus the following should be considered as a preliminary report, which may be altered subsequent to completion of its conservation. The device was clearly curved. The length of the upper plate is at least 300mm, as none of its side edges has been identified as yet. The width of the plates ranges between 40mm and 50mm and the thickness is 2-3mm. The lower plates exhibit straight side edges. The lengths of the plates apparently shorten down the thigh – the difference on one side was 10mm.

The overlapping iron plates were secured by copper-alloy rivets to leather straps that run on the back of the object, the oxidation products of which are still visible on the plates (**Figs. 9: 1-2; 10: 1**). Differing from the round and flat terminals of the *manicae* rivets, the attachment rivets of the thigh guard are bent at a right-angle (**Fig. 10: 1**). The bent shanks indicate the inner face of the plates, implying that, like the *manica*, the thigh guard's plates overlapped upward (*ibid.*, 69). The inner leathers were 3mm thick as the bent shanks testifies. The diameter of the flat-headed rivets is 7mm. The perimeter of the upper plate is perforated, 6mm from the edge. 2mm diameter holes are consecutively spaced 10-11mm from each other. An additional series of holes is spaced 13mm from the edge. The oxidation of the leather straps suggests that the upper edge of the upper plate was bound by a 10mm strap on both the front and inner faces (**Figs. 9: 1-2**). The internal leathers were arranged along both the long and short axes. The lateral straps protected the inner edges, while the longitudinal straps provided added strength to the articulated plates. This notion is supported by the altering right-angled arrangement of the rivets (**Fig. 10: 1**), part of which is bent horizontally while others are bent vertically. This arrangement indicates that the rivets were seemingly bent along the axis of the straps.

Two possible instances of battle damage are visible on the plates of the thigh guard from Gamala, both the result of blows from an edged weapon (?), which caused their distortions. Battle damage was observed on the brow-guard from Gamala (III.3/A.2) and three fragments of laminated armour plates (p. 39; *cf. ibid.*, 83-84).

In the East, the thigh guard was evidently in use during the Late Roman period. James reports the discovery of the lower end of a thigh guard of iron laminated armour in the Necropolis of Dura-Europos (James 2004, No. 446, Figs. 71 (upper), 72). Two leather thigh guards were uncovered in the collapsed Tower 19 (*ibid.*, Nos. 441-442, Figs. 64-67).[1] A graffito from Dura-Europos (3rd century AD) depicts a *clibanarius* with arm and leg guards (**Fig. 10: 2**), and from the *Notitia Dignitatum* we learn that such devices were still employed in the 5th century AD (*Not. Dig. Or.* XI.2; *Occ.* IX.2) (**Figs. 11: 3-4**).[2]

Armguard (manica)

It is commonly accepted that only in the early 2nd century AD did Roman soldiers reequip themselves with limb defences. The arms of the legionaries on the Adamklissi monument are protected by *manicae*, possibly against the Dacian *falces* (Florescu 1965, Figs. 189-190, 195, 197-201, 204, 212, 217, 221). Nevertheless, as indicated by funerary art (Selzer 1988, no. 59), Bishop and Coulston have argued that the employment of *manicae* was more extensive in the Roman military (1993, 87) and that their appearance should not necessarily be confined to Trajan's campaigns (below).

A comprehensive review of the segmental armguard was recently published (Bishop 2002, 68-71). The articulated lames were attached to a series of internal leathers by means of flat and circular copper-alloy rivets. The lames overlapped each other seemingly upwards (*ibid.*, 69, 71). The pierced ends of many lames indicate some kind of binding, possibly by lacing (*ibid.*, 70; but see below). Near complete examples come from Carlisle (UK) (McCarthy *et al.* 2001, 507; Richardson 2001, 188-189) and *Ulpia Traiana Sarmizegetusa* (RO) (Bishop 2002, 68, note 21). Copper-alloy segments of a *manicae* were uncovered at Newstead (UK), mistakenly identified as a thigh-guard (Robinson 1975, 185-186, Pls. 502-504), Carnuntum (AU) (von Groller 1899, 115-116, Taf. XX 6-10; von Groller 1901, 43; Simkins 1990, 23-26; Bishop 2002, 68, Fig. 3.1), Richborough (UK), Corbridge (UK), Ining (DE) and León (FR) (*ibid.*, 68, notes 17-20). To these we may add one further fragment from Rißtissen (DE) (Ulbert 1959, 106, Taf. 63, No. 22). The copper-alloy artefact was described as 'Wangenklappe (?)', yet its outline, the perforated perimeter and the typical large flat-headed rivet that are very similar to the upper plate from Newstead strengthen my suggestion.[3] An examination of the artefactual remains suggests many differences between military and civil defences. It has been claimed that while military *manicae* encircled an estimated two third of the wearer's arm, the gladiatorial specimen completely encircled it (Simkins 1990, 23).

[1] Copper-alloy and iron scale thigh guards: James 2004, Nos. 443-445, Figs. 68-70.
[2] *Cf.* Column of Arcadius (AD 400) (Nicolle and McBride 1992, 12, lower register).
[3] The object from Rißtissen is an upper most plate (*cf.* Robinson 1975, Pls. 502-503).

Simkins ascribed this distinction to the restriction applied by the latter construction. It was demonstrated by Bishop that the military armguard was protecting the narrow edge of the arm rather than its back, thus allowing the elbow a freer movement (2002, 71 and Fig. 8.5).

Discussion of the introductory date appears to benefit from a recent find at Masada. A single plate (lame) of a *manica* from Camp F_2 (III.20/C.1; **Pl. III.20A: 3-4**), suggests that the armguard was in service sometime between AD73/74 and AD106-111. The slightly distorted object consists of a copper-alloy band, 14-16mm high and 0.5mm thick. The original length of the plate was 92mm (present length: 88mm). Three flat and round-head leathering rivets rise from the plate surface. Its small measurements indicate that the object was seemingly the terminal plate of the wrist. It that respect it differs from the terminal plates from the Eining (DE) and León (ES) finds which are riveted to together (*ibid.*, 69 and Fig. 8.4). In addition, the lame from Masada does not exhibit the common feature of lateral holes, which appears to have held the lining of the edges. Nonetheless, several lames from Newstead lack this feature as well (Robinson 1975, Pls. 502-504, 2nd and 5th lames from above).[4] In the present state of the evidence, it is hard to determine whether this difference represents a variation or if a lining was not needed in the case of a terminal plate.

A peculiar object from Gamala possibly adds further evidence for the early introduction of the armguard. The semicircular metal article (80x132mm; height: 15mm; weight: 44.69gr) has a curved cross-section (III.3/C.2; **Fig. 11: 1**). Its front face is tinned and the perimeter is perforated with fifteen holes (2-3mm). The latter indicates that it was originally mounted on a leather (?) lining, the scanty remains of which are visible on the inner face (**Fig. 11: 2**). The delicate circles observable around some of the holes possibly indicate the use of domed head rivets. Its outline bears a considerable resemblance to the shoulder plate of the *manica* of a *secutor* statuette from the Musée de l'Arles Antique (FR) (**Fig. 12: 1**; Junkelmann 2000a, Fig. 62). If this suggestion is correct we may offer the suggestion that legionaries were equipped with armguards as early as the 2nd half of the 1st century AD, as implied by the tombstone of Sex. Valerius Severus (Selzer 1988, no. 59). These few examples appear to accord with the suggested adoption date of the armguard by the gladiators in the late 1st century AD (Robinson 1975, 186).

A single possible representation of an arm defence was found in a Roman tomb from Tel 'Eitun (**Fig. 12: 2**). Armed with a trident (*fuscina*), the man is described as holding in his left hand a small square shield decorated with a chi-like sign (Tsaffiris 1982, 22). However, as the incision patently depicts a *retiarius*, I suggest identifying the square element that protects his left hand, rather than being held by it, with the *manicae* or *galerus* or a combination of both

[4] However, not all of these plates are in the correct position in the Curle photo reproduced by Robinson (Michael Bishop, *pers. comm.*).

(Junkelmann 2000a, 59, Figs. 56-58, 59-60). This notion is strengthened by the image of a *retiarius*, on a glass bowl, whose *galerus* is depicted with a chi-like crossing lines, identical to the Tel 'Eitun's incision (*ibid.*, Fig. 12; **Fig. 12: 3**).

*(b) Greaves (*κνημιδες; ocreae*)*

Metal greaves (*κνημιδες*) were a very common piece of equipment among Hellenistic soldiers, splendid gilded pairs of which were unearthed in the royal 'Philip's tomb' (Andronicos 1984, 186ff, Fig. 150) and in the 'Prince's tomb' (*ibid.*, 217, Fig. 185) at Vergina. The employment of greaves is well attested in both the artefactual and representational evidence of the period.[5] Varied sources mention the use of greaves in Hellenistic Palestine.

According to some versions of the apocryphal composition – *Testament Judah* 3.1, the Amorite king was struck on his '*επι τας κνημιδας*' – 'shin-guards'. The heavy horsemen of the War Scroll were garbed in 'cuirasses, helmets and *battē shoqayim*' (1QM VI.14), the latter term clearly denotes greaves (Yadin 1962, 122-123). In the *Mishnah* we find the same order of defensive equipment as in the War Scroll: 'a man may not go out... not with a cuirass or helmet and greaves' (Shab 6.2). The term that was used is *maggafayim* (Kel 11.8; T Kel BM 3.1; Shab 60_a; *ibid.*, 62_a) – and see below.

The legionaries of the Roman republican army wore an iron greave on their right legs (Polyb. 6.23; Veg. 1.20). The ample Roman use of greaves in the 2nd century BC declined to such a degree that in the late Republic its employment was confined to centurions; the evidence for this chiefly derives from funereal art (Robinson 1975, 187; *contra* Coulston 1998, 5 and note 69). Although no examples are known from Republican sites, two possible presses for greaves were identified at the site of Cáceres el Viejo (ES) (Mutz 1987).

It is generally accepted that the greave went out of use during the early Principate, its representation being restricted to trophy scenes alone (pillar in the Pèrigueux Museum, after Robinson 1975, Pls. 411-412). In our region, the IUDAEA CAPTA coins (AD71-81) feature several depictions of greaves as part of the *congeries armorum* (Meshorer 1997, 161-165, Pl. 79: 384a-b, 385). Greaves were seemingly reintroduced to the Roman legionaries during Trajan's campaigns in Dacia (AD101-102, 105-107), apparently as a response to the intimidating Dacian *falx*. This notion is based upon the statuary evidence of the *Tropaeum Traiani* at Adamklissi (RO) (Florescu 1960, Figs. 192, 199, 212; Robinson 1975, Fig. 192). Greaves were then presumably adopted from the gladiatorial arsenal, which included a large

[5] Snodgrass 1967, 24-25, 31, 42, 52-53, 57-58, 64, 71, 73, 75, 76, 92, 104, 110, 117, 128, Figs. 27-28, 29-30, 37, 39, 45; Connolly 1981, 59, 69, 78, 80.

variety of limb defences throughout the Principate, each type of warrior with its special protectors (Coulston 1998b, 5; Junkelmann 2000a, Figs. 19-21, 25, 32-33, 36-38, 44-46, 49, 51-55, 62-63). The employment of greaves increased significantly among the Roman cavalry towards the late 2nd century AD and even more conspicuously during the subsequent century (Robinson 1975, 188-189). This flourishing usage is reflected in the rabbinic literature, as according to the *Mishnah* (Kel 11.8; Shab 6.2) greaves (*maggafayim*) constituted part of the military panoply (Krauss 1948, 210). A copper-alloy fragment of a greave was found in 3rd century Dura-Europos (James 2004, No. 447, Fig. 72).

Roman military greaves, to judge from the artistic representation and the archaeological finds, took two main forms: greaves with ankle guard and attached knee-guard, and plain shin-guards that lack those features. The former type was made of copper alloy and tends to be highly decorated, either by embossed, punched or engraved designs (Robinson 1975, Pls. 505-509, 512-513; Garbsch 1978, Tafs. 3:1-3, 11:1, 38:1-6, 39:1-2). It commonly has a round face but a V-section body is documented as well (Junkelmann 1996, Abb. 153). The second type is far less represented in the archaeological repertoire. It has a V-section and is generally undecorated (Robinson 1975, 188, Pl. 510). The plain greave is made both of iron (*ibid.*) and copper alloy (Garbsch 1978, Taf. 39:3, 5-6). The decorated type is regularly equipped with a knee-guard, whereas only one documented example is associated with the plain type (*ibid.*, 82: Q13, Taf. 39:5).

The earliest artefactual evidence for the reintroduction of greaves during the 2nd century comes from the hoard found in a cave near Hebron, which dates to the Second Revolt (V.31). We will therefore re-examine this find, as the published information concerning these greaves is partial and at times erroneous. The preliminary publication presents one photo alone that exhibits merely part of the associated fragments (Weinberg 1979, Pl. 25:6). In addition to the two iron[6] greaves noted by Weinberg (*ibid.*, 85), a close examination of the finds, now in the IM, indicated that the hoard contained further elements, most notably a knee-guard (**PL. V.31F: 1-2**).

As mentioned above, two plain iron greaves survived, unfortunately in a fragmentary state that does not allow a full reconstruction. Both objects exhibit a V-sectioned body; the carination along the long axis presumably added strength against blows. The greaves differed mainly in the design of the upper edge. One exhibits the common straight-angled flaring rim, while the second terminates in a slightly curved plain edge. To the best of my knowledge, this simple kind of edging is as yet unattested; the closest comparable example (though not similar) is from Künzing (DE) (Robinson 1975, Pl. 510 – left). Both the greaves from Judaea

[6] Erroneously noted as bronze in: Garbsch 1978, 59.

share the same lower-end design, which flares in a shallow angle that closely fits the bend between the shin and foot.

An additional difference lies in the spacing of the upper sets of rings. Roman greaves were fastened to the soldiers' legs by leather straps that were tied to small iron rings. A bronze statuette of Mars exhibits a 'Union Flag' arrangement of leashing (*ibid.*, Pl. 508).[7] The eyelets are spaced in pairs along the upper, lower and sometimes middle section of the greave. In the case of Hebron, the upper pair of rings of the straight-angled flaring rim greave was fastened very close to the upper edge (20mm), while in the second greave it is spaced some 95mm below the rim. The simple iron soldered ring passes through a small iron band that was riveted by a small pin. As already noted, a third pair may have occupied the middle section of the greaves, now missing.[8] The iron knee-guard, of which the crescent upper part and one lower corner have survived, is plain and surprisingly no fastening device is observable along its lower edge. This may be explained by its fragmentary state of preservation or that a different attachment technique was used. The knee-guard seems to belong to an additional greave.

It is hard to assign with certainty the finds from Judaea to either foot soldier or cavalryman, as the evidence from the Roman west is inconclusive. The ornate type, equipped with a hinged knee-guard and ankle protector, was used by Roman horsemen as the inscriptions on the back of three greaves and one knee-guard refers to a *turma* (Garbsch 1978, 48-49, B10-12). The rarer plain greaves with no knee-guard may have been confined to infantry alone during the 2nd century AD, if we are to trust the Adamklissi reliefs, which is a single testimony.[9] In light of the above it appears that the hoard under discussion contains greaves that belonged to both infantry (2 shin-guards) and cavalrymen (1 knee-guard). This

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[7] No organic remains were traceable on the inner faces of the greaves. Leather was seemingly used for the lining of metal greave, although padded trousers are claimed to be sufficient protection (Junkelmann 2000a, 52). Remains of leather were traced on the inside of one pair of greaves in the 'Philip's tomb' (Andronicos 1984, Abb. 103). Although described as 'Ärmellfragment', the outlines of near complete leather object from Vindonissa (CH) and most notably the medial rib that runs along its axis indicates it served as a greave lining (Gansser-Burckhardt 1942, Abb. 23). A fabric liner of a greave was apparently found in Dura-Europos (James 2004, No. 448, Fig. 73; Pfister and Bellinger 1945, 59, No. 292, Pls. XXX, XXXII, XXXIII D1).

[8] Both two and three pairs of rings are documented on Roman greaves. Many of the former arrangement had a knee-guard to which a third pair of rings was attached. In such cases the upper set of rings of the shin-guard was spaced at a relatively low position.

[9] The examples from Künzing originated in a fort that was built by *cohors III Thracum cR eq c.* AD90 as a timber fort. It was rebuilt in stone in AD140-150 by *cohors V Bracaraugustanorum* (Michael Bishop, *pres. comm.*). Although it was seemingly mostly garrisoned by auxiliaries, one cannot overrule the possibility of the presence of an additional small detachment of legionaries.

accords well with the notion that the hoard is more heterogeneous in nature rather than representing the panoply of a single soldier (*contra* Weinberg 1978, 86).

(iv) Shields

A variety of sources provide a wealth of details concerning the shields that were used in Roman Palestine. A brief account of the shields used in late Hellenistic period is in place as the initial phase of my study is a direct sequel of that period. It is followed by a short chronological overview and then a detailed discussion of each type.

The books of Maccabees occasionally note the employment of shields by the Seleucid armies in Palestine. The impressive appearance of the Seleucid gilded and copper shields is mentioned in the narration of the battle of Beit Zechariah (1Macc. 6.39).[1] In contrast with the lavish descriptions of the Seleucid bucklers, the soldiers of Judah Maccabaeus were markedly ill equipped in the initial stages of the revolt. Contrary to their aspiration, we read, they had neither armour nor swords (*ibid.*, 4.6).[2] Shatzman assumed that this distinct inferiority of weapons concerned a shortage of shields as well (1991, 12). The armies of the subsequent Hasmonean rulers in the late 2nd century and first half of the 1st century BC were far better organized and equipped (*ibid.*, 22-35). The term *hoplon*, used by Josephus to describe the shields of the Hasmonaean armies, was still in use by Roman soldiers in Egypt (P. Mich. 214), illustrating the prominent place Greek had in the east. In 147BC the army of Jonathan overcame the Seleucid army of Apollonius, near Azotus. The Hasmonean force wore out the enemy's cavalry by attaching their shields in a dense formation (*AJ* 13.95-97; 1Macc 10.80).[3] This drill recalls the usage of shields in the 'Tower Formation' of the War Scroll (1QM IV, 12), hereby discussed.

The War Scroll notes three types of shields, using the basic biblical term – *magen*: מגן (*magen*) = shield, מגן עגלה (*magen agala*) = circular shield and מגני המגדלות (*maginei ha'migdalot*) = shields of the 'towers'. The initial type was used by the soldiers of the *Front Formation*, and it is commonly identified with the Roman *scutum*. This identification is mainly based upon the erroneous interpretation of its dimensions (2.5x1.5 cubits), detailed decoration scheme (1QM V, 4-6; Yadin 1963a, 115-120; Shatzman 1996, 115-117) and its mistaken attribution to the Roman arsenal. The cavalry force employed the circular shield (1QM VI, 15; Yadin 1963a, 120-121).[4] The shields of the *men of the towers* (3 cubits long) were used by the soldiers who fought in a formation called 'tower' (1 QM IV, 12; Yadin 1963a, 121-122; Shatzman 1996, 117).

Shields boards are a rare find in the Roman Empire, due to the perishable nature of the wood, cloth, leather and fibres, of which they were produced. Second only to the celebrated

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[1] *Cf.* Homer *Il.* 19.373-380; Gera 1996, 27-31.
[2] Bar-Kochva mistakenly translates here shields (1988, 202-203) – *contra*: Shatzman 1991, 12, note 6.
[3] Bar-Kochva 1980, 83ff.
[4] During the Republic the small round shield furnished the Roman cavalry (Polyb. 6.25), but was replaced by the more firm and solid Greek shield (Robinson 1975, Pl. 305).

assemblage of 3rd century AD Dura-Europos[5], the Masada collection is one of the largest known from the Roman world. As in Dura, the arid conditions and the total abandonment of the site contributed much to the preservation of the shields including exceptional elements such as paint, and even more significantly the ancient DNA of the leather facing. The sampled and analysed DNA provided unique data concerning the nature of the used raw materials (see p. 87). Nearly all parts and shield-fittings uncovered in Palestine derive from fields of conflicts and even battlefields. The fragmentary boards from Masada were found in several dumping heaps that were created in the very last days of the revolt. The material from Gamala, on the other hand, consisting of bosses, reinforcement bars and ownership tags, was uncovered in the immediate fighting zone outside and inside the wall of the city. The two identical bosses from Gamala (III.3/E.1-2) appear to represent the equipment of possibly one auxiliary unit, while the fragmentary reinforcement bars constituted part of the panoply of one legionary – L. Magus.

The earliest shield-fitting in Roman Palestine derives from Kh. Qumran. The copper-alloy U-binding was found in layer 1B, that fell to ruins in the earthquake of 31BC. However, the dominant group of finds is from First Revolt sites like Masada and Gamala, consisting of boards, bosses, handgrips and reinforcement bars. A fragment of the typical lobate U-binding was found in siege Camp F, near Masada (**PL. III.20A: 5**), providing an exact date of AD73/74. For that period of time (AD66-73/74), we posses the direct testimony of Josephus. He commonly uses the general term *θυρεοί* to note the shields that equipped the Roman legionaries and cavalries. Yet, the shield of the citizen soldiers, undoubtedly the *scutum*, is distinctly marked as *θυρεὸν ἐπιμήκη* – 'oblong buckler' (*BJ* 3.95). Josephus uses *θυρεός* to indicate the shield of the horsemen (*ibid.*, 3.96), while the round *ἀσπίς* is mentioned as the shield of the general's guard (*ibid.*, 3.95). The shields of the Jewish insurgents are merely referred to as *θυρεοί* (*ibid.*, 3.259, 4.290, 5.120, 6.174, 6.179). This Greek word is rendered in Hebrew by the word תריס (*thriś*) that is discussed below. The Second Revolt (AD132-135) sites yielded far fewer artefacts. Fragments of boards were discovered in two refuge caves in the Judaean Desert, a fragment of a *scutum*-like shield (**PL. V.14A: 5**) and a small remnant of the oval plank type (**PL. V.20A: 1**). In addition, a reinforcement bar was found at Bethther, the major stronghold of Bar-Kochba (**PL. V.6C: 1D**).

The representational evidence from Palestine exhibits a variety of shields types. Aside from the example from Kh. es-Salantah (V.31), presumably drawn by a rebel that documented a brother in arms, all other representations apparently drew upon the motifs of imperial propaganda, and are therefore not to be trusted typologically. A circular decorated shield appears on the coins of Herod. The face of the board exhibits four semi-circles, the perimeter of which is ornamented by waves and dots (**Fig. 2: 1 – bottom**). This motif further appears on a

[5] James 2004, 159-187, Pls. 6-10, Figs. 94-113.

Jewish ossuary from Mount Scopus (**Fig. 14: 1**), although it is erroneously described as a circle with rosette ornaments. This feature occupies the central medallion of the 'Baroque Room' of Petra Great Temple (**Fig. 14: 2**). A sculpted oval shield, decorated by a medusa head and studs that are spaced around its perimeter, was uncovered at Sūr (Sahr) (SY) (Butler 1907, 445, Ill. 387: L), a site that was associated with the settlement of Zamaris's soldiers under the auspices of Herod (Thomas Weber, *pers. comm.*). During the Hellenistic and early Roman periods the shield was used as a major symbol of sovereignty on the coins of the Jewish rulers (p. 232). Victory is depicted writing the name of the triumphant Flavian imperators upon oval or circular shields (Meshorer 1997, 165 and 164, Nos. 8, 14-15; Pl. 79, Nos. 382-383). Such shields formed part of the *congeries armorum* on the JUDAEA CAPTA coins (*ibid.*, 164, No. 11). The circular 'shield' appears on the Jewish lamps of the early 2nd century – known as 'the Southern lamp'. In addition to plain circular faces (**Fig. 13: 2a-b**), this type is also represented with a weathercock-like motif (**Fig. 13: 2c-d**).[6] However, of particular importance is the incised *graffiti* of an oval buckler that equips a local warrior at Kh. es-Salantah, dating to the days of the Second Revolt (**PL. V.32A: 2**). Incisions of gladiators from a Roman tomb at Tel 'Eitun includes a *secutor* armed with a rectangular shield (Tsaffiris 1982, 22, upper Fig., Pl. V.4), and a possible additional representation of such a shield (*ibid.*, Fig. 3.1). We may also note the symbolic *pelta* shield, which is depicted on a Southern oil lamp (IAA No. 69-1233) and appears on JUDAEA CAPTA coins (Meshorer 1997, Pl. 79, Nos. 384, 384a, 385). Oval and hexagonal shields appear on the coins of the procurators (*ibid.*, Pl. 79, Nos. 340-341) and the JUDAEA CAPTA coins (*ibid.*, 164, No. 15; Pl. 79, Nos. 384-385), while a unique trophy capitol from Legio is decorated with a dozen hexagonal bucklers (Tepper 2002, 235, Fig. 12; Stiebel and Tepper, forthcoming). A diagonal shield appears on a coin of Marcus Aurelius minted in Aelia Capitolina (Meshorer 1989, 78-79, coin 46).

(a) Shield types

The rabbinic sources and Josephus provide us with explicit references to the types of shields (*thrišin*) used in Roman Palestine, testimonies that are given by local civilians and an ex-warrior respectively. This information will therefore be critically examined in light of the contemporary archaeological data, allowing the discussion of the various types of shields and their construction techniques. Four major types of shields were apparently used in Palestine: the *scutum*, oval plank and wickerwork shield and the Arab targe, though other minor types will also be discussed.

[6] Whirl rosette: Rahmani 1994, 40-41, Fig. 85.

Thriŝ

Hebrew has adopted the Greek term for a long shield, *θυρεός*, to designate shields in general, that is תריס (*thriŝ*) (*Lehn. II*, 593-594).[7] A ruling in the *Mishnah* provides a unique detailed listing of the types of shields (*thrišin*) employed in Roman Palestine (**Fig. 15: 2**):

> שלשה תריסין הם: תריס הכפוף – טמא מדרס; ושמשחקין בו בקמפון (קנפון) – טמא טמא מת; ודיצת הערביין – טהורה מכלום' (כלים כד א)

The traditional translation reads:

> 'There are three shields: a bent shield has the status of *midras* impurity; and the one with which they perform (lit. play) in the *compon* (amphitheatre) has the status of impurity caused by a corpse; and the joy (or plaything) of the Arabs is entirely pure' (Kel 24.1).

Amongst modern scholars, the first type is unanimously identified as the *scutum*.[8] This interpretation is based upon the Hebrew adjective כפוף (*kafuf*), mentioned in the ruling, which means bent. Thus it appeared only appropriate to identify the first type (תריס הכפוף) with the most celebrated curved Roman shield – the *scutum* (p. 79ff). However, when one turns to the second type of shields, this definition appears to disagree with the information embodied in that ruling. The law reads: '...and the (shield) that one plays with in the *compon* – is unclean'. The presence of corpses, a very common occurrence in the *arena*, causes the status of impurity.[9] Dead gladiators are commonly illustrated lying upon their shields (Grant 1967, 70).[10] It is clear that the shape was not the criterion intended by the Sages to be used for determining the purity of that shield, but what has been done with it or rather where it has been used. Thus, **any** shield that was used in the *arena* has consequently fallen under the second category. Knowing that the *scutum* was employed in gladiatorial games, alongside varied other types of bucklers, Sperber admits that there is a difficulty in regarding the תריס הכפוף as a *scutum* (Sperber 1998, 92-93). Should the first type designate the *scutum*, it is unclear why it was re-included in the second *halachah*. This unnecessary duplication was attempted to be solved by the suggestion that the *scutum* has been confined to one group of gladiators – *Thraces* – which according to Sperber, were possibly more common in the *arenae* of Roman Palestine (*ibid.*). It is hard to accept such an argument, particularly as the Jewish sources distinctly indicate that a variety of warriors participated in the games (Weiss 1994, 206). Judging from the representational inventory of

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[7] The range of meanings of the noun included that of screen; and by the verb – to cover and to protect. Interestingly, the bridal veil was called in the east *tanura dasa* (Ket 17_b). Epstein demonstrated that this term originated in the Syriac word *tanvara*, which is equivalent to the *θώραξ*, suggesting a sort of curtain – a veil (1948-49, 105-106); *contra*: Brand 1953, 704.

[8] Sperber 1998.

[9] The presence of corpse implies that *compon* designate the *arena*.

[10] *Cf.* Salazar 2000, 219.

gladiatorial equipment, no sole shape indeed has been employed in the *arena*; both curved, oblong and round shields are there present. Hence, if curved bucklers were to be referred to in the first ruling, we are left with no explanation for the repeated inclusion of it in the second.

Furthermore, an additional obstacle for identifying the first mentioned shield with the *scutum* is its impurity status: the shield is susceptible to *midras*. Stepping over or even sitting on an object that is susceptible to *midras* (literally indicating treading) would give it a status of impurity. Commentators claimed that due to its bent shape soldiers were probably sleeping on this shield in the battlefield (Kehati, *ibid.*, Sperber 1998). However, they seemingly overlooked the existence of the *umbo*. The protruding boss would have made sleeping on a *scutum* a rather shaky experience for its owner, implying it was highly impractical. It seems beyond any doubt that the common interpretation is inadequate and a more comprehensive explanation for the status of *midras* impurity given in the *Mishnah* is required.

The key for deciphering these difficulties lies in the understanding of the actual criterion to be employed in accordance with the first ruling. In fact, it appears that the shape was not the criterion, but rather the material or technique used to produce the first shield mentioned in the *halachah*. From the ancient rabbinical sources we learn about a very popular basket employed in Roman Palestine – the Egyptian *kfifa* (כפיפה). It is taken to be a small basket, corded from palm fibres[11] or willow shots[12], with ears – i.e. handles.[13] The term *kfifa* also denotes fishing equipment, which was made of wickerwork (T Makh 3.12).[14] As the practice of cording involves bending of reeds (Isa 58.5), it is easy to see the etymological connection between the verb לכופף (to bend) and the product – the noun כפיפה (*kfifa*). On this background I would like to suggest that תריס הכפוף in the first ruling was a wickerwork shield. That is, not a curved shield but rather a shield that was produced from bent reeds. Hence we are equipped with a solution for the status problem, as treading was commonly used in basketwork for the bending of the raw material.[15] Objects made from reeds, palm leaves, willow, tree leaves and bark, have all the status of impurity.[16] But, did wickerwork shields exist in the Roman world and particularly in the Roman East?

Wickerwork shields

Though not frequently recognised, wickerwork shields were not alien to the Romans. The evidence for shields of this type derives from both historical and archaeological sources. Objects, the weight of which was double that of a 'standard' shield (*scutum publicum*), were

[11] Rashi, Sot 14_a.
[12] *Apud*, BB 22_a.
[13] Shab 78_b; Erub 21_b; Yeb 21_a.
[14] Maimonides refers to this object as כפוף (*The rulings of food impurity*, 17.6).
[15] Made either for sitting, treading or lying (Kel 24.10; Suk 1.11; *cf.* Kel 17.17, 20.7).
[16] Maimonides, *the ruling of Kelim*, 1.13.

utilised by the new recruits during their basic training (Veg. 1.11). In his *Epitome*, Vegetius refers to these training shields as *scuta viminea* (*vimina* = osiers or wicker). This type of buckler was not confined to training alone, as there are sufficient indications to assert the employment of wicker shields in actual combat. The arsenal of Rome's enemies incorporated wicker shields, thus we may note the Germans who had shields made of '*viminum textus*' – woven osiers (Tac. *Ann.* 2.14.4) and the Aduatuci were armed with 'shields made of bark or wickerwork, which they hastily covered with skins' (*BG* 2.32). Nevertheless, the use of such shields was especially common in the Near East where canes and reeds are abundant (*Ecc R* 2.8).[17] The tradition of wickerwork shields is well rooted in the ancient Levant. The sculpted documentation of Sennacherib's campaigns appears to depict Assyrian infantry employing reed shields.[18] The Ugaritic word *ql'* has been associated with the Near Eastern siege shield, which was constructed from plaited reed laced with wide leather bands (Eichler 1990). The lengthy tradition of this type may be partly explained by the marked availability of the raw material. Scythian shields of the 4th century BC may have well been constructed in a similar manner. A possible artistic description of this appears on several highly decorated implements, the most famous of which is the golden Solokha comb (Piotrovsky, Galanina and Grach 1987, Pls. 128-9). One of the warriors is there depicted carrying a crescent-shaped buckler, seemingly constructed of reeds or wooden sticks. The famous light-armed troops of the Greek armies were known from the fifth century BC as the *peltasts*, named after their shield (*pelta*). According to Aristotle it was a rimless wicker shield, covered with goat or sheep hide (Snodgrass 1967, 78-79). According to Xenophon, contingents from Piraeus used painted wicker shields (Xen. *Hell.* 2.4.25). Describing the equipment of tribal fighting forces of Persia, Media and the Cissia, Herodotus notes that 'for shields they had wicker bucklers' (7.61-62; *cf.* Amm. 24.2.10). The shape of the Persian wicker shields is reported by Strabo as rhomboidal (*Geog.* 15.3.19) and the figurative evidence from Palmyra appears to present circular wickerwork shields (Schlumberger 1951, Pl. XLI; Colledge 1976, Pls. 27, 37, 44, 129, 143; Sumner 1995, 21, upper right). The Persian warriors who used such a shield were named *gerrophoroi* (Xen. *Oik.*, 4.5) after the small wickerwork shield (*γέρρον*). Xenophon identified the *pelta* with the *gerrhon* (*Anab.*, 5.4.12). Moreover, the wickerwork shields 'such as the Amazons carry in paintings' are termed *gerrha* (Poll. *Onom.*, 1.133). This terminology is of particular interest as both in Hebrew and Aramaic the word that designates an arrow is *gera* (גירא). As arrows were produced in the Near East from canes the etymological relation between the material and the product appears to be evident. Indeed according to the *LSJ*, the word *gerron* designates also a stake and a dart.

[17] *Cf.* Thuc. 4.9.1.
[18] Ussishkin 1982, 80-81, Fig. 67.

A papyrus testimony suggests that at least in Roman Egypt legionaries have employed wickerwork shields on a regular basis. The document (*P. Berlin* 6765), which details the product of two working days of a legionary *fabrica*, notes the production of *scuta talaris*. The term *talaria*, being a loaned word from the Greek (*talaros*), denotes basketry.

What was the shape of the wickerwork buckler in Roman times? Illustrating Vegetius's account of the new recruits' training, Connolly depicts rectangular curved wickerwork shields identical in shape to the legionary *scuta* (1981, 218). However, the text explicitly notes that the '*scuta de viminea... in modum cratium texebant*' are circular (*conrotundata*) in shape (Veg. 1.11).[19] The most impressive evidence for plaited shields derives from the excavations of Dura-Europos. Not less than four shields of the type were uncovered in the excavations (three of which were near complete examples). The excavators report canes that are woven with leather bands (Baur and Rostovtzeff 1931, 74, Pl. XXVI); but, according to James the Duranic shields are made of wooden sticks rather than canes (2004, 163, 169-170, Nos. 635-638, Figs. 111-113). This very technique is noted by Aineias the Tactician who mentioned the production of plaited shields that are reinforced with 'braces of leather and wood' (29.11-12).[20]

Though I have referred here to personal shields only, wicker was also used for the production of screens, which were employed on the unit-level. Such devices shielded besiegers that operated near the city-walls. Josephus notes the 'wicker (*γέρρων*) shelters' of the Roman Battering-engines (*BJ* 5.479) while Vegetius informs us about the use of *plutei* (4.15). These items resemble Amminianus's description of Persian hurdles and mantles of wicker (19.7.3).
From the above it is evident that during the Roman period wickerwork shields were a very common piece of equipment in the Roman east, and the testimony of the *Mishnah* adds Palestine to the countries in which wickerwork shields were frequently employed. In my eyes, it is not a coincidence that the wickerwork is the first shield to be discussed in the ruling, being written through the eyes of the local population.

Scuta[21]

Despite the fact that the *scutum* – the semicylindrical shield – is not noted in the *Mishnah*, the type that is mostly identified with the Romans is best attested archaeologically in Roman Palestine. There is no evidence for the Republican *scutum* (Kimming 1940), and although scholars have identified one of the shields described in the War Scroll with the *scutum* (Yadin 1962, 115-120; Shatzman 1996, 115-116), careful examination of its description cast grave

[19] Still, does the net-like incised pattern on the *scutum* reflect a wickerwork rectangular shield (Junkelmann 2000, Abb. 147)?
[20] Aineias describes the plaiting of osier helmets (29.12). Such devices protected the helmets of Pompeius's soldiers against the Balearic slingshots (Sumner 1997, 108). The vegetate remains of Roman helmet covers were detected in the Netherlands (van Enckevort and Willems 1994, 127, Fig. 6) and in Germany (Schreiter 1993, 47-49; Kempkens 1993).
[21] For the problem of Latin terminology: James 2004, 167.

doubts regarding this interpretation.[22] As noted above, Josephus describes the *scutum* as *θυρεὸν ἐπιμήκη* – 'oblong buckler' (*BJ* 3.95). The *scutum* had a diversity of forms, whose outlines were apparently not only of a true rectangular shape. Analysing the sculptural and artefactual evidence Coulston demonstrated that both rectangular, sub-oval and true oval shields were used by legionaries (1988c, 201-202). Indeed, an *aquilifer*'s tombstone exhibits an elongated oval legionary shield that appears to accord well Josephus's narration (**Fig. 13: 1**). In light of the terminological ambiguity of the shield I find that it is rather the shared construction of layers of plywood, textile/vegetal fibres and leather facings than the outlines of the shields that should be used as the criterion for identifying the citizen soldiers' shield. No less than ten fragmentary boards, several U-bindings and one boss with the typical rectangular flange are known from the fields of conflicts of the First Revolt. Only one *scutum*-like fragment was found in a refuge cave of the Second Revolt (V.14/E.1). Based on the representational and partly the artefactual evidence, the late 2nd-century – early 3rd century AD witnessed a marked decline in the popularity of the rectangular type (James 2004, 168-169). It is mentioned in the Latin literature (Dio 49.30.1) and the latest archaeological presence of the type is in Dura-Europos (James 2004, Nos. 629-631, 609). To the late examples we should add the oval bone shield model, exhibiting a winged lightning emblem, that was uncovered in Tel Dan (IL) and appear to derive from the 3-4th century AD (Stiebel 2003b).

Construction of scuta

Remains of some ten shields were found during Yadin's excavations. The main assemblages were recorded in three loci, which contained rich collections of dumped objects. One set of fragments comes from the debris in Casemate Room L1039 (the 'casemate of the scrolls') (*Masada* III, 416-422). The second group originated in Tower Room L1276 ('the tannery') (*ibid.*, 440-445). A third assemblage was found in L92 – a square south of the Northern Palace, which was the focus of massive dumping activity (*ibid.*, 112-114, Plans 2, 3). In addition, a well-preserved painted fragment was found in one of the caves of the southern cliff – L2050 (III.19/E.10). Two types of shields are represented in Masada, the most common of which is constructed of three layers of pressed wood or fibre layers, covered on both sides with leather. Evidence from L1276 clearly indicates that it had rectangular outlines with leather binding, very close in shape to the shields uncovered in Vindonissa (CH), both according well with the standard shield of the legionaries – the *scutum* (Gansser-Burckhardt 1942, 74-79, Abb. 49-53). It should be emphasised that the corner represented on the leather facing (III.19/E.7) is slightly rounded, similar to the Vindonissa examples as well as the recently discovered covers from Roomburg (NL) (van Driel-Murray 1999, 49ff, Fig. 8). The fact that the well preserved

[22] This description appears rather to reflect the Hellenistic shield, the decoration of which is linked to the grammar of Greek motifs.

fragment of the *scutum* (III.19/E.7) shares the same construction method with the rest of the associated fragments, in particular the usage of vegetal fibres in the production of the board, seemingly suggests that they should all similarly identified, i.e. as *scuta*. Some of the examples of this type had a painted leather facing (III.19/E.1 and E.4). The only example of the use of painted gesso on the leather facings of a scutum board was found in the Cave of the Sandal (V.14/E.1) – for the use of paint, see p. 89, 91ff.

A variant of this type was found in L1276 and L2050. It is characterised by the employment of plywood planks rather than vegetal fibres. A copper-alloy U-binding sheathed a board of two plywood layers angled to each other at 90° (III.19/E.8), which were coated on both sides by fibres of a palm tree. The latter may have served as a base for leather facings. The fragment was too small for determining whether leather facings indeed existed. An additional example is presented by one specimen (III.19/E.10), consisting of two layers of wooden planks on top of which was laid a pale fabric, soaked with glue, that acted as a binding agent for the leather painted facing. The group of shields that comes from the excavations at Vindonissa is apparently constructed of light wood with a covering of linen and leather, which was glued in place (Gansser-Burckhardt 1942, 73-89). Euphrates poplar (*Populus euphratica Oliv.*) was used in the making of two *scuta* boards from Masada (III.19/E.3 and 10) (Liphschitz 1994, Table 17, 334), and of an oval plank shield board from the Cave of the Pool (V.20/E.1). The same wood was used for the construction of the oval plank shield boards at Dura-Europos (James 2004, 160, 167, explicitly noted for Nos. 616-618, 620, 624). This accord well the list of recommended woody species for shield constructing provided by Pliny

> '...the most flexible, and consequently the most suitable for making shields, are those in which an incision draws together at once and closes up its own wound, and which consequently is the more obstinate in allowing steel to penetrate; this class contains the vine, agnus castus, willow, lime, birch elder and both kind of poplar. Of these woods the lightest and consequently the most useful are the agnus castus and willow; but they are all suited for making baskets and things consisting of flexible wicker-work. Also they are shiny and hard, and easy to use in carving. Plane has flexibility, but of a moist kind, like alder' (*Nat. His.* 16.209).

A *scutum* board from Dura (Shield 15) is made of a plane wood (*Plantanus orientalis*) (James 2004, No. 629). It appears that vegetal fibres, of the palm tree, were used in the production of the *scuta* boards at Masada. The producer of shield 2050-11 (III.19/E.10) used, in addition to the glue soaked linen, a tiny copper-alloy pin for the attachment of the leather facing to the board. A rare use of wooden dowels for the planks' fastening was observed on the plywood planks of shield 1039-61 (*cf.* James 2004, No. 631, Fig. 108).

At Masada, as well as one example from the Cave of the Pool (V.20/E.1), hides were used as an

integral facing of the shield. Both the front and rear faces were coated with leather: *cf.* Doncaster: Buckland 1978, 251. This clearly differentiates the assemblage of Palestine from the west, where most leather fragments associated with shields appear to be interpreted as covers. The different climatic conditions may account for this variation, as the arid climate of the Near East makes the employment of covering unnecessary. For a detailed discussion of the leather facings of both the *scuta* boards see: p. 86ff.

The *scuta* leather facings were painted red: a lavish crimson example is recorded at Masada, while faint remains of red paint were observed on the facings of two additional boards (p. 91ff). The board of the *scutum* was seemingly strengthened by iron bars, part of which may have been attached to the periphery of its back. Other served as part of the gripping device (pp. 88-89). Most of the shields' perimeters have not been preserved. However, from the several available pieces in the War Scroll it is clear that two different methods were used for the shields' edging. A U-guttering copper-alloy edging is attested in addition to leather binding (p. 90). There are no signs of the attachment of bosses to the Masada boards, the single example of the 'typical' boss with square flanges was found at Aro'er (III.21/E.1) (p. 85ff).

It is interesting to examine the *Midrashic* phrase – *ascuta parsa* (*Mid Ps* 1.4), which on its face seems to designate a Persian shield. Yet, the term *scutum* is exclusively associated with the Romans and its construction that protected the soldier from three sides accords well with the Roman shield. Moreover, in the rabbinic sources the word Persia was often used as a censor-version term designating in fact Rome (Dalman 1922, 350). Thus, we should actually read here 'Roman *scutum*'! An alternative approach is noted in the Aramaic translation that relates to the word *parsas* as a synonym or a term that explains the action of the shield. In *Tragum Onkelos* (2nd century AD) it was suggested that the term *parsas* derives from the Latin word *paries* that designates a wall; i.e. 'a wall of *scuta*' that corresponds to the formation in which legionaries fought. The late reference of the *Midrash* appears to concur with the prolonged employment of the *scutum* in the east. Although the representational evidence suggests that by the beginning of the 3rd century AD the *suctum* was abandoned, the Duranic assemblage of *scuta* from the AD250's and the reference of Cassius Dio to: 'shields hollowed and channel-like' (Dio 49.30.1), seems to indicate that in the east this type was used longer than in the Roman west.

Oval plank shield

Until recently the oval plank shield was known from Dura-Europos alone. With some thirteen reported boards, including five complete examples, it is the most prominent type (**PL. V.20A: 2**; James 2004, 159, 160, 161, Nos. 616-634). A fragment of this type was found at Nahal David, in the Cave of the Pool (**PL. V.20A: 1**), dating from the Second Revolt. Although small in size, it is evidently a section of the edge of the board, featuring the characteristic perforated perimeter. The latter feature was seemingly used to attach the leather binding (p. 90).

However, this type may have been in use as early as the First Revolt. The second type of shield found at Masada was somewhat difficult to characterise, as only a few fragments of it have been preserved. Excavated in L92, the seven fragments, nevertheless, testify to the existence of a shield board constructed from relatively thick wooden planks. Though it is impossible to assert the exact outlines of the shield as none of the edges has been preserved, their resemblance to the oval plank shields from Dura-Europos, as is discussed below, suggests a reconstruction of oval shield seemingly with leather edging.[23] Given the lack of edging, one must be cautious with the identification. Yet, if correct, the Masada specimens precede the Duranic examples by some eighteen decades and the Second Revolt example by six decades.

'The shield played in the compon'

The second shield that is noted in the *Mishnah* is the one played in the *compon*. This term derives from the Latin *campus* and the Greek *κάμπος* (Krauss 1899, 510). Furthermore, the verb 'play' implies that the *halachah* is dealing with a civic show in the amphitheatre, rather than exercising military drills in the *campus* (parade-ground).[24] The bloody games that took place in the *arena* clarify the reason for which the Sages determined the shields, there played, as unclean due to the 'impurity of the dead'. As noted above it is apparent that all shields, regardless of their shape, which were used in the *arena*, fall under this category.[25]

The Arab (Nabataean) shield

The last type of shield noted in the *Mishnah* is explicitly associated with the neighbouring Arabs.[26] The numerous artistic representations, in particular the *Dromedariorum* figurines, present a small round shield (**Fig. 15: 3-4**).[27] It may be associated with the desert targe, a local shield that lacked a boss and for which there is ample evidence in representations (Colledge 1976, Pl. 27; James 2004, 160, 169). According to Negev, the design of Nabataean ear-rings, unearthed in Oboda, was inspired from the outlines of the Arabian shield (**Fig. 15: 1**). Its characteristic features are expressed in the ruling that finds such objects pure since there were not good even for protecting their bearer (Maimonides, *Hilchot Kelim*, 27.4; Albeck 1959, 98). The expression 'the דיצה (*ditza*) of the Arabs' was commonly interpreted by modern commentators and lexicographers as 'the joy of the Arabs', indicating the festive races of the Arabs – the *fantasia* (Sperber 1998, 93). However, this notion has been largely fostered by the

[23] Brown 1939.
[24] Weiss 1994, 247-250. For training in the campus, see: Veg. 1.11, Polyb. 20.20; Livy 26.51.3; parade and training grounds: Davies 1989, 93-119; Arrian *Tact.*, 34.1-2, 36.1, 38.1-2, 39.1-2, 40.2.3 and 9, 41.2, 42.2-4, 43.1.
[25] Gladiatorial employment of shields: Coulston 1998b; Junkelmann 2000.
[26] For the Nabataean army: Graf 1994.
[27] At least in some representation the round feature must be identified as junction *phalerae*: Soltan 1969, 36, Ryc. 12; Kahser 1988, photo on p. 196.

archaic romantic western perception of the Orient in the 19th–early 20th century. Let us turn back to re-examine the term דיצה. In his dictionary of Aramaic words in the Jewish sources, Dalman included the word דיצא (Dalman 1922, 97). The word with the typical Aramaic suffix of א (equivalent to the Hebrew suffix of ה) is interpreted as a 'Gazellenart' – a type of gazelle. Listed among the pure animals (Deut 14.5), this term appears in the Aramaic translation of the Bible with the vowel *tsereh*[28] (Sperber 1959), thus pronounced – *deitzah*. Examining the punctuation of the ruling under discussion in the authoritative Kaufman's manuscript of the *Mishnah*, the term appears indeed in *tsereh* rather than *hirik* (**Fig. 15: 2**)! We should therefore read here the 'Arabian *deitzah*', i.e. 'the Arabian shield made of a gazelle (skin)'. This type of shield was made from the hide of a gazelle, which is the commonest hunted animal in the desert districts inhabited by the Nabataeans.[29] The hide was secured by metal pins that are discernable for example on a Palmyrian relief (**Fig. 15: 7**). According to the *Mishnah*, this shield was considered 'entirely pure'. Its small size and the fact it was made of leather, suggest that the reason for this ruling is rather related to the purity rulings of leather. Leather objects that were smaller in size from the measure of 38.1cm x 38.1cm (5 handbreadths x 5 handbreadths) are considered pure (Kel 27.2). The representational evidence appears to indicate that the measurements of the leather Nabataean shield do fall within this span, thus it is considered pure.

Pelta

Lastly, during the Roman period, the *pelta* shield is commonly associated with ritual and symbolic design rather than battlefield use functions. A *pelta* is depicted on a Southern oil lamp that dates to the period between the two Jewish revolts (**Fig. 15: 5**). Although published as a Phoenician boat (*sic*!), its outlines, and in particular the tendril-like terminals, accord well with the *peltae* that ornament, for example, an *umbo* from Mainz (DE), as does the combination of a *pelta* and a double-edged axe that appears there (Southern and Dixon 1996, Fig. 20).[30] Such a design decorates a breastplate from Angebl (DE) (Born and Junkelmann 1997, 133, AG 713, Abb. 84, Taf. XII). A *pelta* shield is further depicted on the JUDAEA CAPTA coins from the mint of Caesarea (AD71-80) (Meshorer 1997, 242, Nos. 384, 384a, Pl. 79). All the representations from Palestine indicate that this anachronistic design was confined to the Roman world of symbols alone and does not represent any actual use.

[28] A Hebrew vowel that is pronounced: 'e' as in bed.
[29] It was hunted in special stone-built installations known as 'kites', which formed a killing zone into which the animals were driven.
[30] *Cf.* Xen. *Anab.* 5.4.12-14.

(b) Boss types

Three copper-alloy *umbones* from the Early Roman period were discovered in Palestine: one at 'Aro'er and an identical pair at Gamala. Interestingly, no iron boss is recorded in Palestine from the period under discussion. This deficiency may be explained in the metals' different rate of preservation. At Dura-Europos the ratio between copper-alloy and iron bosses was 3:1 and was so accounted for (James 2004, 160).[31]

A hemi-spherical boss with a rectangular flange was found at 'Aro'er (**PL. III.21A: 1-3**). This type is ascribed to the legionary curved *scutum*. Although it frequently occurs in the sculptural evidence, archaeologically it is a relatively rare find (Bishop and Coulston 1993, 82). In the west, it is reported from Carnuntum (AT) (von Groller 1901, 118-119, Pl. XX), *Aquincum* (HU) (Hoffiller 1912, Fig. 24), the River Tyne (UK) (Bidwell 1997-98, 9, Fig. 5a) and Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 565, Taf. 25). In the east this type has hitherto only been documented in 3rd century AD Dura-Europos (James 2004, No. 609, Fig. 95). The only example, made of iron, is now lost.[32]

The copper-alloy 'Aro'er specimen is slightly curved in section, a trait that accords well the curved board of the *scutum* (von Groller 1901, 118-119, Pl. XX). The boss was seemingly attached by seven rivets, as also discernible on the boss from Carnuntum (AT) (*ibid.*). This arrangement may reflect the original orientation of the boss. The tombstone of Gnaeus Musius, an *aquilifer* of the *legio XIV Gemina*, Mainz (DE), meticulously exhibits the details of the boss attachment (**Fig. 15: 6**). Careful examination indicates that seven dome-head rivets were spaced along its perimeter. Each of the edges has three rivets, but the upper one is fixed by only two rivets located at its corners. Based on the above we may cautiously suggest that the bosses from 'Aro'er and Carnuntum were originally oriented with the two rivets edge upwards.[33]

The second type is a round boss with a distinctly narrow flange, two identical examples of which were found at Gamala (III.3/E.1-2). It was seemingly manufactured by spinning technique. Commonly associated with the shield carried by auxiliary forces, this type differs from most of the western artefactual and sculpted examples that commonly exhibit wide flange. Nevertheless, examples from Volubilis (MA) and Vindonissa (CH) suggest that two sub-types of bosses, with wide and narrow flanges, co-existed contemporaneously (Unz and Deschler-Erb 1997, Nos. 566-568, Taf. 27 (Iron); Boube-Piccot 1994, 137-138, Nos. 218-221, Pls. 84-85). The perimeter of both specimens from Gamala is identically decorated with a running pattern of punched dots while punched nipples crown the bowls' centres, indicating in all

[31] 7th century AD iron bosses from Jerusalem: Stiebel 2003 c; *cf.* Maier and Ponting 1996.
[32] *Cf.* the 2nd century AD helmet from Nawa (SY) (Abdul-Hak 1954-55, Pl. VII).
[33] The boss from Carnuntum is published upside-down.

likelihood one workshop. Holes and iron corrosion products (rust) testify that the bosses were fastened to the shield board by four iron rivets now perished that were spaced equidistantly around the flanges. This very same arrangement is found on the *umbo* from Volubilis (MA) (*Ibid.*, No. 218) and is faithfully depicted on one of the Mainz *principia* pedestal reliefs (Selzer 1988, 244, No. 271).

(c) Technology and construction

Leather facing and covering

It is commonly held that the Roman shields used in the west were protected by leather covers (van Driel-Murray 1999). Indeed, Julius Caesar mentions the practice of covers being removed prior to battle (*BG* 2.21; *cf.* Dio 56.3). Nevertheless, not all scholars accepted this interpretation, and Bishop and Coulston write: 'some commentators have suggested that the shield board itself was covered with leather which was glued to it, even covering the bosses, but this fails to account for the fact that some bosses at least were clearly designed to be seen' (Bishop and Coulston 1993, 82). However, the logic of this argument is not altogether valid. The notion of boss covering is seemingly based upon a leather hide that was unearthed in Vindonissa (Gansser-Burckhardt 1942, 86-88, Abb. 62-63). Examining this find we may argue that the bowl of the boss could have been attached upon the leather projection, and that the perforation around its outlines may represent the mean of attachment. The drawing of this fragment (*ibid.*, Abb. 63) indicates four focuses of holes that do not fit the zigzag perforation and may have served as fastening holes for a flimsy boss, like the two examples from Gamala. Be that as it may, the finds from Palestine seemingly justify the prior suggestion that regard at least some of the hides as part of the shield's front rather than covers. This notion is supported by Tacitus's narration of the German panoply in contrast to the Roman weapons from which it is understood that the Roman shield was strengthened by both metal and leather (Tact. *Ann.* 2.14). The inventory of shield remains from Palestine, and most notably from Masada, indicates that leather facing was an integral part of the shield's construction. Furthermore, there are several examples in which the hide was applied on both the board's faces. This notion is further confirmed by Josephus's narration of the terrible hunger that prevailed in Jerusalem at AD70:

> 'Gaping with hunger, like mad dogs, these ruffians went staggering and reeling along, battering upon the doors in the manner of drunken men, and in their perplexity bursting into the same house twice or thrice within a single hour. Necessity drove the victims to gnaw anything, and objects which even the filthiest of brute beasts would reject they condescended to collect and eat: thus in the end they abstained not from belts and shoes and stripped off and chewed the very leather (*δέρματα*) of their bucklers' (*BJ* 6.196-197).

On balance, there are indications that at least in the west, hides served as facings as well as covers, a variableness which may be account for the wetter conditions that have required an added protection of hide covers. Still, although no supporting evidence was found, James assumed that due to the fragile nature of their surfaces, the Duranic painted boards had to be protected by covers, whether made of leather or textile (James 2004, 169).

The artefactual evidence from Palestine indicates that both shield's faces were protected by hides, which were glued upon textile (linen) or palm fibres. Leather facings, of both the front and rear faces, were seemingly observed also on an auxiliary shield from Doncaster (UK) (Buckland 1978, 251, 268-269).[34] The fragment from Masada (L2050-11/4) accords well with the celebrated Polybian description of the construction of the Roman shield (Polyb. 6.23.3).[35] The common interpretation of two wooden boards, which were glued to each other and thereafter have been covered with textile and hide, was recently criticized (Bar-Kochva 1999, 34-36). According to his interpretation of the Polybian combination *διπλοῦν σανίδωμα* (Polyb. 6.23.3) Bar-Kochva suggested that the *scutum* had a double sets of three layers of plywood (= six in all) (1999, 34-36). However, this notion must be rejected in face of the archaeological finds from Ksar el-Harit (EG) and Dura-Europos that exhibit a long lasting tradition of production of shield boards with three such layers. His argument that none of the known examples fit the principle construction seems awkward (*ibid.*, note 88).

The exact nature of the hides used in Dura-Europos was not clear, whether parchment or cruder calves' skins (James 2004, 160, 162). In an interdisciplinary research project, a DNA sample of a hide facing was taken from one of the Masada *scuta* boards (III.19/E.7) (see Appendix 1.1). DNA was extracted and twice analysed (Kahila-Bar-Gal 2000, 61, 63-64). The results are of particular importance as they are absolute and draw away from the identification problems of morphological examination (*ibid.*, 66, 67, 68, Table 3.5). The sequences of the shield (Primer G_{11}-G_{12} and 116-117) clad with the sequences of the Baladi (local domestic goat) and the *Capra hircus*, indicating that the sampled specimen was a *Capra* (goat) species, and more precisely it is a hide of a domestic local goat.

Shield hides were termed in Roman Palestine as תרכוס (*tarcus*) or טרקוש (*tarkuš*) (*Lehn. II*, 592-593). These words appear to derive from the Latin word *tergus* (or *tergum*) (Krauss 1929, 9-10). One of the meanings of this word was leather, yet examples are further known for the use indicating a shield coated by leather layers: Mart. *Epig.* 7.2.1-2; Ovid. *Met.* 13.347.[36] According to the *OED* the word targe appears to have roots in the Arabic *al-darqah*: the shield of leather and wood (p. 86ff).

[34] Glued facing in Vindonissa (Gansser-Burckhardt 1942, 74).
[35] *Cf.* James 2004, No. 629.
[36] I thank Israel Shatzman for these references.

The above noted differences between east and west may be accounted for by their different climate conditions. There is no need of a covering in the normally hot and dry weather of the east, unlike the wet conditions in the west. Theoretically, these differences may simply reflect different traditions of production, but our pool of evidence is as yet too small for evaluating such a possibility.

Reinforcement bars

Iron bars were frequently used to reinforce the shield's board. The bars added strength to its structure and provided further durability against brakeage. We may point out the possible existence of two types of bars: the central and the circumferential bars, presumably in accordance with the shape of the shield. The initial type formed part of the gripping device (p. 90), with its arms extending beyond the *umbo* providing added strength to the axis of the board. Arms that terminate in a bent T-like element are depicted on the rear face of a shield on Trajan's Column (scene LXXII; Cichorius 1896, Taf. LII, Cast 185). Such objects were found in Newstead (Curle 1911, 182, Pl. 34.2, 4, 5) and Vindonissa (Unz and Deschler-Erb 1997, 27, Nos. 559, 560, 562, 564, Taf. 25), the impression of which is visible on a shield hide from Vindonissa (CH) (Gansser-Burckhardt 1942, Abb. 56-57). It seems that such metal bars may have been attached not only to the front face of the shield but to its rear as well. At least part of the metal decorative elements of the front face (the Doncaster shield), so commonly depicted in the imperial propaganda monuments (e.g., the Orange arch), might have had a strengthening function as well. If this notion is correct, the above noted impressed hide from Vindonissa should be identified as the face of the board rather than a shield's cover. The second type of bars – iron reinforcement bars, with flat circular terminals – are reported from Bonner Berg (DE) (van Driel-Murray and Gechter 1983, 59, Taf. 16: 28), Rheingönheim (DE) (Ulbert 1969, 52, Taf. 47, 1-4), Hofheim (DE) (Ritterling 1913, 144, Taf. XVIII, 1-17), Hod Hill (UK) (Manning 1985, 147, T9-10) and Bar Hill (Robertson, Scott and Keppie 1975, 100, Fig. 33, 19). Fragments of iron strip were discovered together with the remains of L. Magus's panoply at Gamala (III.3/E.3). The bars have circular terminals and may have been used to reinforce the shield board. An additional example was found at the site (III.3/E.4), as well as at Masada (III.19/E.11). An additional example comes from Bethther (V.6/E.1) (*cf.* example from Bar Hill (UK) (Richmond 1968, Fig. 58, A4). It seems that there might be an overlap, meaning that reinforcement bars could have been used as gripping bars as well (p. 90). A peripheral system of wooden strips is documented on the back of *scuta* boards from Dura-Europos (James 2004, Figs. 107-108). Such an arrangement of iron frame would have improved the resistance of the *scutum*'s edge against blows. If this notion is correct, it would suggest that the Romans did not depend on the durability of the rather flimsy copper-alloy binding and added strips of iron around the entire perimeter of the board.

Shield grip

In a comprehensive analysis of representational and archaeological evidences, Coulston has demonstrated that the Roman method of carrying the shield was the central horizontal grip, in use for both flat and curved types (Coulston 1988c, 231-232).[37]

The Roman gripping device was commonly composed of an iron bar with a folded-over central grip. It was spaced laterally to the shield long axis.[38] Such gripping bars are common finds on military sites (Strasbourg (DE): Forrer 1927, Taf. LXXIX: E; Carnuntum (AT): von Groller 1901, 106; Taf. IX: 30-32; Hod Hill (UK): Manning 1986, 147, with further references to UK and Germany). This element is partly visible on tombstones of Gaius Valerius Secundus and Quintus Luccius Faustus (Selzer 1988, 131-132, Nos. 38-39, Abb. 17) and on Trajan's Column (scene LXXII; Cichorius 1896, Taf. LII).

In the east, similar grips are known in Dura-Europos (James 2004, 162, Nos. 610-615, Figs. 96-97). A unique Byzantine iron boss from Jerusalem (AD614) was found still attached to its grip bar, whose affinities are very similar to the Roman examples (**Fig. 16: 1-2**). A more simple form of handgrip was a flat iron bar with circular terminals (Newstead (UK) – Bishop and Coulston 1993, Fig. 46, Nos. 5-6). A fragment of such a handgrip was found at Bethther (V.6/E.1). It exhibits the typical flat circular terminal and disc head rivets, although this may rather be a reinforcement bar (p. 88).[39]

The very shallow circular bosses from Gamala were not large enough to clear the fist holding the grip within, suggesting that the shield grip protruded from the rear surface of the board, thus allowing its carriage. This trait was also observed in the case of the Doncaster shield, which produced Buckland's conclusion that 'a sharp blow on the boss would be transmitted straight to the knuckles, with consequent loss of grip unless some padding was provided' (Buckland 1978, 259). Indeed, 'coarse reddish hair' was found padding the inside of a circular shield boss from Caerhun (UK) (Morris 1895). If my suggestion concerning the hide with the boss-like shape, from Vindonissa, is correct, its bowl-like protrusion could have similarly served as the boss's lining.

Edging

Roman shield boards were commonly set in a metal binding that improved the resistance of its perimeter against blows. Nevertheless, some of the excavated boards were either set in leather binding (Dura-Europos; The Pool Cave (IL), Masada (IL)) or were not edged at all (the early example of Ksar el-Harit (EG)).

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[37] *Cf.* Aemilius Paullus monument at Delphi (GR) (Bishop and Coulston 1993, Fig. 1).

[38] The single exception is the Doncaster shield, whose grip was reconstructed in a longitudinal position (Buckland 1978, 249, Fig. 7; Coulston 1988c, 232.

[39] The object was originally published as a scale beam (Kirshner 1946, 159, Fig. 2).

The rims of most of the shields excavated in Palestine have not been preserved. However, from the few available examples it is clear that two different methods were used for the shields' edging. There are two distinct examples of leather binding of the *scuta* boards from Masada. The flat oval plank type was also set in a sewn leather edging, as its perforated perimeter testifies (The Pool Cave). The fact that both metal and leather binding was used emerges in Tacitus' description of the German shields: 'The German has neither cuirass nor helmet; even his shield is not strengthened with leather or steel, but is of osiers woven together or of thin and painted board' (Tac. *Ann.* 2.14.3). In addition, copper-alloy U-sectioned bindings are recorded at Masada, Gamala (III.3/E.5-6) and a Herodian example from Kh. Qumran (III.17/E.1). The common metal edging of shield boards involved a copper-alloy gutter. Copper-alloy rivets fastened the U-section binding to the board, through two types of holes. The most popular guttering had lobate expansions that extended from it (Valkenburg (NL): Groenman-van Waateringe 1967, 72, Fig. 18; Vindonissa (CH): Unz and Deschler-Erb 1997, Taf. 25, Nos. 548-554, 556(?), 558, 561). In addition, flat-headed circular rivets simply pierced the metal binding (Vindonissa (CH): *ibid.*, Taf. 25, Nos. 547, 555, 557; Hofeheim (DE): Ritterling 1913, 143ff, No. 1 and Taf. 18, 24; Zwammerdam (NL): Haablebos 1977, 219, Nos. 19, 221, Abb. 17, 19). In Palestine, the latter method is much more common. In fact, only one example exhibits the lobate expansions, found at siege Camp F, Masada (III.20/E.1).

Technology

I will briefly review several technological aspects of the construction of the different shield types. Tool marks are noticeable on plywood planks from Masada. The plywood was worked with planes that left distinctive chatter-marks (**Fig. 16: 3**). Similar patterns were observed on the planks from Dura-Europos (James 2004, 163, Fig. 101).[40] A fragmented plywood board from Masada (III.19/E.3) featured the rare use of small wooden dowels. These dowels were used to fasten the plywood layers to each other. Seemingly smeared with glue, the dowels were inserted through pierced holes (2mm in diameter). This technique, attested on one board from Dura-Europos (*ibid.*, No. 631, Fig. 108), presumably provided added horizontal stability to the layered structure of the board.

As discussed above, the wooden faces of the *scuta* boards were protected by leather. The findings from Masada illustrate the Polybian technical description: 'it is made of two planks glued together, the outer surface being then covered first with canvas and then with calf-skin' (Polyb. 6.23.3). It appears that the hide was stretched upon a layer of linen soaked in glue or a layer of palm fibres that similarly served as a foundation. This intermediate layer also added strength to the board structure and improved its resistance against missiles' penetration. A thick

[40] Planes: Ward-Perkins and Claridge 1976, 276.

fibrous layer that was between the wood and the hide was observed at Dura-Europos (James 2004, 162).

It must be remembered that the metal decorative elements that were fastened to the front face of the shield contributed to the securing of the leather face to the wooden board (Buckland 1978, 259). Such a function was seemingly performed by the shank of a copper-alloy rivet that was observed on a shield fragment from Masada, which attached the hide to the wooden board (III.19/E.10). Domed rivet heads from Doncaster (UK) were used to decorate the shield board (*ibid.*, Fig. 5). A large number of tinned domed rivet heads from Gamala may similarly be identified (these are not included in the dissertation and will be separately published in the final report of the excavations).

Interestingly, in addition to glue, finds from Masada indicate that bitumen was used as a pasting agent. Fragments of wood from two boards which were smeared with bitumen to which pressed wood or fibres and leather still adhere were found. Bitumen remains were further observed on the surface of several more fragments of shields from L92 at Masada, but this appears to represent rather a post deposition process (III.19/E.5-6). The employment of bitumen, a local substance that was extracted from the Dead Sea (Stiebel 2000), indicates a local production of shields.

(d) Shield painting and decoration

Roman shields were decorated in varied methods. For the Hellenistic period, a single example of painted shield was unearthed at Ai Khanoum (AF) (Bernard 1973), although the varied wall-paintings and painted tombstones suggest that this practice was much widespreaded. Painted boards were most notably found in Dura-Europos (James 2004, Nos. 616-634). The paints, 'in a water-based or tempera medium' (*ibid.*, 164), were applied upon a layer of gesso and skin covering. The Hellenistic example from Ai Khanoum (AF), which is dated to the 2nd century BC, exhibits a vague image of a figure and a human eye (Bernard 1973). The assemblage from Masada allows us a glimpse into the colour palette used for the ornament of the shield board, to date documented in the East at Dura-Europos alone. Three leather board facings from Masada were painted red.[41]

In Vindonissa, tooled leather facings were discovered (Gansser-Burckhardt 1942, 74-79, Abb. 49-51). An embossed strip upon the face of a large fragment of a shield (III.19/E.1) may have been an ornament, though it seems more appropriate to interpret it as an imprint of a reinforcing bar.

[41] The painting (ציור) or possibly moulding (צר) of a king's shield ('coat of arm') on the walls of his palace is mentioned in *Tosafot Taan* 3_a (Krauss 1948, 50).

Several leather facings exhibit stitching remains of leather appliqués (van Driel-Murray 1999). Several consecutive stitching holes on leather facing from Masada (III.19/E.7) mark the outlines of a now unfortunately perished *ansata* appliqué, which in more complete parallels from the west bore the unit designation (Gansser-Burckhardt 1942, 79, Abb. 52-53; 83-86, Abb. 59-61; van Driel-Murray and Gechter 1983, 35-36; van Driel-Murray 1999, Fig. 3). A possible specimen originated in Dura-Europos (P. Dur. 131; James 2004, 22).

Metal decorations ornamented the facing of the Doncaster shield, among which we may note dome-head studs (Buckland 1978, 251, 253, 256, Figs. 3-6). A large number of tinned domed studs was found at Gamala, akin in shape to the domed studs that fixed the bronze sheet which surround the Doncaster boss (*ibid.*, Fig. 5: 1). The copper-alloy stem found embedded in the *scutum*'s board from Masada (III.19/E.10), presumably formed part of such a stud.

Colours and patterns

To date painted shields of the Roman period have been reported nearly only from Dura-Europos (James 2004, Nos. 616-634; Goethert 1996). The leather facing of a *scutum* board from Masada was painted crimson red (**PL. III.19K: 3**; Nah 2.4). The colour was applied directly upon the facing hide. Faint remains of red paint were observed on the facings of two additional shields (III.19/E.1 and III.19/E.4). There are indications that additional leather facings may have been painted as well, but the colour has long perished. Interestingly, leather fragments painted Azure were found together with a *scutum* board in L1039, Masada (III.19/E.1). However, the fragments are yet to be studied and at present their linkage with shield facing is not at all secure. Red and black were used for the ornamentation of an additional *scutum* fragment from the Sandal Cave (V.14/E.1). The colours were applied on top a layer of what appears like gesso. This choice of colour and technique is very much manifest on the 3rd century AD Duranic shields (James 2004, 163ff). It has been suggested by James that the painted shields might have been used as parade or sport shields (*ibid.*, 166), but nothing in the contexts of the examples form Palestine appear to support this notion.

Graffiti of a patterned shield carried by a local rebel was uncovered at the site of Kh. as Salantah (**PL. V.32A: 2**). This design is very similar to the shield depicted on Ivory clasp knife handles (Allason-Jones and Miket 1984, 300, No. 6.2, Pl. IX) and a 4th century AD glass beaker from Cologne (DE) (Southern and Dixon 1996, Fig. 21, Pl. 13). The assignment of shield emblems to specific units appears to have been practised in the late Roman period (Veg. 2.18; James 2004, 164, 166).[42]

[42] Late Roman bone shield model from Tel Dan with a winged lightning emblem: Stiebel 2003 b.

(e) Inscriptions and ownership tags

The image of Victory writing upon a shield was very common in Roman art. Frequently represented in the imperial propaganda monuments, it is found for example on Trajan's Column (scene LXXVIII), and in numerous further trophy scenes. Such depictions are commonly presented on Roman coins. A *denarius* of Augustus commemorates the award of a golden shield to the Caesar (Maxfield 1981, Pl. 1.i). In Palestine it was described on the coins of Agrippa II (Meshorer 1997, Pl. 55, Nos. 141, 141a) and on the JUDAEA CAPTA coins (*ibid.*, Pl. 79, Nos. 380-383). Although not always legible, the inscriptions appear to name the victorious Caesar.[43] The association of the divine with writing upon shields is also found in the *Midrash*: 'What is [the exposition of the text] a shield and a buckler... R. Simeon b. Yohai [further] said: The Holy One, blessed be He, gave Israel a weapon upon which the Ineffable Name was written' (*Num R* 12.3).

Ownership tags

The discovery of the remains of a legionary panoply at Gamala included a tag that provides us with the soldier's name and his unit. In fact, two more such tags were uncovered at the site. Before discussing these tags, let us review the Roman costume of marking the shield with names. Cassius Dio referred to the introduction of a new regulation by Tettius Julianus, during the Dacian War (*c.* AD89):

> 'Julianus, who was appointed by the emperor to conduct the war, made many excellent regulations, one being his order that the soldiers should inscribe their own names as well as those of their centurions upon their shields, in order that those of their number who should perform any particularly good or base deed might be more readily recognized' (Dio 7.67.10.1).

This practice was an official institutionalisation of the common individual effort to achieve a prominent appearance on the battlefield in order to win the recognition of the commanders. Polybius notes this ambition as one of the reasons for the *veles* being dressed in wolf skins (Polyb. 6.22). Germans are reported to identify Roman units by their shield devices in the fourth century (Amm. 16.12.6; *cf.* Claud. *Bel. Gild.* 423), a period of time for which we posses an even more explicit testimony. In his description of the ancient legion, Vegetius discuses the practice of marking the name upon the shield:

[43] *Cf.* CL.V.: *clipeus virtutis*, under Augustus.

'**18. The names and ranks of soldiers are to be written on the face**[44] **of their shields.** ...also the name of each soldier was inscribed in letters on the face of his shield, with a note of which cohort or century he was from' (2.18).

But do the small tags from Gamala have anything to do with this practice? Various sculpted monuments clearly indicate that small *tabula ansata*-shaped *notae* adorned Roman shields, spaced on both sides of the *umbo*. Such features decorate the shield of a Roman soldier, depicted on a Flavian stone relief from the *praetorium* at Mainz (**Fig. 16: 4**). A funerary monument, which is dated to the first half of first century AD, depicts the image of Gnaeus Musius, an *aquilifer* of *legio XIV Gemina*. Our attention should be drawn to the shield's centre, which appears to retain two diminutive items, spaced on both sides of the elaborate *umbo*. Careful examination reveals that they are both shaped as *tabulae ansatae* (**Fig. 16: 5**). The very realistic and detailed execution of the overall tombstone adds to the reliability of this testimony, which accords well the finds from Gamala.

The reasoning Dio Cassius offered for this practice is clearly not applicable here, for it seems highly improbable for anyone to read the small size *notae*, particularly during the heat of battle. It seems that the answer to the function of the Gamala finds is more simple. Numerous inscriptions on arms, with the formula of the owner's name and unit, some in the shape of *tabula ansata*, have been executed in an unskilled manner (Robinson 1975, Pls. 140-1; Oldenstein 1976, 192-193, 265-266, Nos. 756-765, Taf. 60; *RIB* 2427.18-20; Macmullen 1960). Such inscriptions were evidently intended to serve as an ownership tags, among the soldiers themselves, so that a soldier would not take an arm that was not his, whether by mistake or not. This practice surely prevented more serious misunderstandings, like stealing. The crude technique of the punched letters in the Gamala articles and the cursive inscribing hint that the equipment owners have presumably written the tags themselves.

As noted above, three copper-alloy shield tags were uncovered during the excavations at Gamala, all as yet unpublished. They share of the outlines of a *tabula ansata*, and lateral attachment holes pierce the thin tags' ears. All three are found to bear punched inscriptions (*punctim*).[45]

The first tag was unearthed in Area T, Locus 4019 (**PL. III.3Y: 2**), forming part of the panoply of a Roman soldier, which in addition to helmet-fittings, fragments of a '*lorica*

[44] And not 'on the inside of their rank' or latter 'on the reverse side of the shield' as translated by Stelten.
[45] I am indebted to Prof. Tomlin for the initial reading of the three tags.

segmentata' suit, a *gladius*'s scabbard chape and the handle of a *pugio*, included also a reinforcement bar of a shield.

Diplomatic Transcript:

> MVSI
L MAGI
> GALLI

Translation:

of the century of Mus(us) / century of Musi

(property) of L(ucius) Mag(us)

of the century of Gall(us)

The duplication of the *centuria* is of interest. Judging from the lines' layout and spacing on the note, it seems that the original inscription retained only the second and third lines, and that the somewhat squeezed legend, > MVSI, was added in a latter date. The association of multiple centuries with one soldier in ownership inscriptions is not common. However, a Flavian inscription on a circular boss from Zwammerdam (NL) mentions both: T VERACIS PVPI and T MANSVETI PVPI (Haalebos and Bogaers 1970), suggesting the soldier Papus either served in two *turmae* or under two different commanders. Similarly it seems appropriate to assume that L. Magus either changed *centuriae* or that his commanders have shifted. Lucius Magus[46] was a citizen soldier. If we are to trust Josephus' account he did not serve in *legio XV Apollinaris* as the latter was positioned in the eastern sector 'over against the point where stood the highest tower in the town' (*BJ* 4.13), whereas the tag was found in area T, on the very other side of the Wall. Thus, he was either serving in *legio V Macedonica*, that fought against the 'centre of the city' (*ibid.*), or in *legio X Fretensis* that was 'employed in filling up the trenches and ravines' (*ibid.*). It is commonly accepted that two legions were involved in the actual fighting and the *legio X Fretensis* was engaged in the trench-works. Therefore, this soldier had to be affiliated to the *V Macedonica*.

The officers' names deserve dwelling upon. The first to be noted is a *centurion* name MVSI. The standard reading would be: Musus, a very rare *cognomen*. I could not find it in the military nomenclature. A single reference is made to a Greek sculptor: '...whoever this Musus may have been...' (Paus. 5.24.1). We are familiar with the famous lineage of Publius Decius Mus, that according to legend sacrificed their life (4th-3rd century BC). The abbreviated version

[46] lit. the wise man, magician.

of Mus[... is documented in several military inscriptions (Soulahti 1955, 375, No. 157).[47] This *cognomen* may have stood for Musius, a celebrated example is Gnaeus Musius, an *aquilifer* of the *legio XIV Gemina*, Mainz (DE). Since the *cognomen* Musus is as yet unattested, an alternative reading can be sought. It appears that 'Musi' can stand for a man who came from Musia or Moesia, similarly to 'Suri' that represents a man of a Syrian origin (*LD*).[48] Thus, this centurion may have had a Moesian origin.[49]

In addition, L. Magus served under the command of a *centurion* by the name of Gallus (lit. Gallic), a well-attested *cognomen*. In a remarkable coincidence the only *centurion* name to enter Josephus's account of the battle at Gamala, was that of Gallus (*Γάλλος*) (*BJ* 4.37-38). Although very tempting, it seems far-fetched to suggest an identification of the centurion noted in the ownership inscription with the very Gallus mentioned by Josephus, being a rather popular *cognomen*. Nevertheless, be that as it may, it is a vivid relic from the fight witnessed by Josephus during his first steps alongside the Flavians.

The second ownership tag was also found in Area T, Square B: 7,8, Basket 1351 (**PL. III.3Y: 3-4**). Uncovered near the surface and outside the wall, it was unearthed near the two towers in Area T and close to corridor 4019.

Diplomatic Transcript:

C VETQ[
C · LICI[

Translation:

of the century of Veto(nius)
(property) of C(aius) Lici(nius) / Lici(nianus)

The point that follows the letter C in the prefix of the second line, suggests the reading of the praenomen Gaius, whereas the letter C in the first line appears to mark the *centuria*, following the formula of naming both the soldier and the unit. For the cognomen Licinius see: Kajanto 1965, 204).

The third ownership inscription (**PL. III.3Z: 1**).

Diplomatic Transcript:

[47] A tombstone of MVS.VET. of *legio XV Apollinaris* (Bahat D. and Sabar Sh., *Jerusalem – Stone and Spirit*, New York, 1998, p. 79). *Cf.* Paus. 5.24.1.
[48] The nickname *Musi* (mouse) is unlikely.
[49] A prosopographical study of the *legio X Fretensis*'s officers: Dąbrowa 1993.

> PIO

Translation:

the century of Pius (or Pio(nius))

The *cognomen* Pio appears as a variation of Pius (lit. pious, dutiful, affectionate, holy).

In addition to the tags, ownership inscriptions are commonly found scratched or embossed upon the flanges of the bosses; UK: River Tyne: *RIB* II, Fasc. 3, 48, No. 2426.1; Matfen, Northumberland: *RIB* II, Fasc. 3, 49, No. 2426.2; London: *RIB* II, Fasc. 3, 49, No. 2426.3. Germany: Koblenz (MacMullen 1960, 34); Mainz (*ibid.*, 35); Butzbach (Bishop and Coulston 1993, 115, Fig. 76); Thorsbjerg (MacMullen 1960, 34); Klumbach 1966. The Netherlands: Zwammerdam (Haalebos and Bogaers 1970); France: Misery (Sommer 1984, 95-96, Pl. 56.3). Dacian examples: MacMullen 1960, 34, 37.

As noted above, tooled shield facings were picked out in openwork, mentioning the unit designations. The shape of the appliqués is commonly that of a *tabula ansata* (see, above).

(f) Tactical employment of the shield

The Roman training program of the recruits was designed to gradually qualify them in the employment of their personal gear. The more advanced stage was intended to train the *tirones* in the proficiency of fighting in large formations. Each soldier was expected to know his place in the mass of soldiers and more important to efficiently operate in it. One of the most famous Roman drills was the *testudo*. The closed formation of soldiers protected its front and side faces, as well as the upper dimension, with their shields (Dio 49.31). Josephus explicitly uses the term χελώνην (= turtle) describing such a manoeuvre during Cestius Gallus's siege of the Temple in Jerusalem (*BJ* 2.537). This exercise is further noted in the account of the Roman assault at Jotapata (*ibid.*, 3.270) and during the unsuccessful first Roman attack at Gamala (*ibid.*, 4.33-34). The Zealots used the same tactic in Jerusalem, creating a 'penthouse of bucklers above their heads' (*ibid.*, 4.290; 6.27), as did the defenders of Jotapata (*ibid.*, 3.260). The practice of this famous Roman drill, which involved the noise of clashing shield boards, appears in the *Mishnah* (Sut 8.1).

In combat, Romans soldiers are occasionally reported to have killed their opponents with their shields, using the *umbo* (Livy 5.47.4). According to the *Babylonian Talmud*, in critical situations when being short of arms, Persian soldiers lethally punched their foes with their

shields (AZ 15_b-16_a; Krauss 1948, 248). A ruling in the *Palestinian Talmud* forbade Jews to sell shields to gentiles as the latter could have used it against him as a weapon (PT BM 9_d).[50]

[50] Some of the Sages did permit this sell, arguing that the shield had only a defensive function and it did not actively endanger life (AZ 16_a).

4. Offensive equipment

(i) Edged weapons

This section deals with swords and daggers, their scabbards and sheaths. The assemblage from Early Roman Palestine includes five blades of swords (three at Masada and two in Jerusalem), two of which are sheathed. Five blades of daggers were further unearthed (Ein-Gedi, Jotapata, Masada, Nahal Yattir Site, Mo'a). Many hilt fittings, both of swords and daggers, were discovered made of bone, ivory, wood, iron, copper alloy and lead. In addition, a rich repertoire of copper-alloy and iron scabbards and sheaths is documented, most of which exhibit U-guttering metal bindings, although two plain metal scabbards of short swords or daggers are recorded at Samaria and in the Jeselsohn collection. The use of organic components, such as wood and leather, is regularly attested in scant corrosion products. However, worthy of mention are a unique red dyed leather scabbard from Masada (III.19/F.18) and the organic remnants (leather and wood) of the scabbard from Beit Caiphus, Jerusalem (I.7/F.1). Scabbard fittings are rather common finds, among which we may count metal and bone frogs (pp. 127-129), as well as metal suspension loops, mounts and locket plates and scabbard chapes. A silver frog was found together with a dagger sheath at Samaria (I.6/F.1, G.2). The frequency of edged arms is further reflected in the existence of model swords.[1] A model sword of the 2nd half of the 1st century BC was found at Gamala (III.3/F.1) and a bone gladiatorial dagger model at Tiberias (II.1/P.1).

The archaeological evidence of swords from Roman Palestine is quite varied. Typologically, both Roman and local types of edged weapons are represented. The contexts of the finds range from battlefields to civil settlement and tombs. Though the assemblage is clearly dominated by fittings that are associated with the *gladius*, hilt fittings of *spathae* are documented as well. An overall look at the assemblage of swords, which represents the entire span of the early Roman period, suggests that it accords well with what is known from contemporary sites in the west. Hence, the typological evolution of the *gladius* throughout the early Roman period follows the same path as in the west (Bishop and Coulston 1993, 53-54, 69-74; Feugère 1993, 97-100, 138-146). The study of the early form of the *gladius* in the east provides further information concerning the diffusion of Roman weaponry into the Hellenistic panoply, more perceptibly during the 2nd century BC (Stiebel 2004a). Three further swords that originated in Herodian contexts (37-4BC), the transition period between the late Republic and the Early Empire, are identified as *gladii Hispaniensis* (pp. 107-109). Interestingly, Josephus uses the term *ῥομφαία* to describe the type of sword used by the rebels. The term is

[1] Béal and Feugère 1987.

understood as a sword with broad blade; can it be linked with the unique sword model uncovered at Gamala (III.3/F.1)? Originally, the word *ῥομφαία* designated a shafted Thracian cut and thrust weapon, the meaning of which was later transformed to designate a sword (Sekunda 1983). This term appears rather frequently in the *NT*[2] and the accounts of Josephus (see Appendix 2), unlike in other Greek or Latin accounts. Can it be accounted for by the presence of a Thracian contingent In Judaea, as part of Herod's army, or to the Thracian auxiliary units that served in Palestine: *cohors I Thracum* and *cohors I Thracum milliaria* (Jarrett 1969, 220-221, Nos. 20-21)? The latter seems unlikely for these two units were stationing in Judaea following the suppression of the First Revolt, not earlier than the mid 80's of the 1st century.[3]

The *NT* indicates that swords were in frequent use in Palestine of the 1st century AD (*NT* Mt. 26.47, 55; Mk. 14.43, 48; Lk. 22. 35-38, 52). If the following citation is not symbolic or rhetorical per-se, one may gain interesting information concerning the price of a sword in Roman Palestine:

> 'And he said to them, 'When I sent you out with no purse or bag or sandals, did you lack anything?' They said, 'Nothing'. He said to them, 'But now, let him who has a purse take it, and likewise a bag. And let him who has no sword (*μάχαιρα*) sell his mantle (*himation*) and buy one. For I tell you that this scripture must be fulfilled in me, 'And he was reckoned with transgressors'; for what is written about me has its fulfilment.' And they said, 'Look, Lord, here are two swords'. And he said to them, 'It is enough'' (Lk. 22, 35-38).

The version of the vulgate notes: '*et qui non habet vendat tunicam suam et emat gladium*'. If indeed one could buy a sword for the price of a tunic, the price of such a weapon should have been around 7 *denarii*, for this was the cost of a linen tunic in Palestine in AD73 (*Masada* II, 55). However the price might have been higher, for the original Greek version notes explicitly *himation* which was clearly an outer garment, that presumably had a higher value. Unfortunately, the price of the *pallium opertorium* in P. Mas. 722 is indiscernible (*Masada* II, 55-56).[4]

To the period that preceded the eruption of the First Revolt we may assign a group of handguards of the horseman's sword that was discovered at Masada. Its homogeneity and the number of handguards appear to suggest that these elements have equipped one unit, seemingly of Garrison A, which manned the fortress prior to the *Sicarii* conquest in AD66 (pp. 116-117). Four fragmentary blades of the First Jewish Revolt were found at Masada. The

[2] Rev. 1.14, 2.11, 2.16, 6.8, 19.15, 19.21; Lk. 2.34.
[3] *Cohors I Thracum* (AD86); *I Thracum milliaria* (AD124).
[4] *Militaria* used as collateral: Harrauer and Seider 1977.

Roman edged arms of the mid-1st century AD are mentioned in Josephus's description of the Roman *militaria* (below). Fittings that belong both to the 'Mainz' and 'Pompeii' types were documented in Gamala and Masada. They include lavish examples of scabbards, among which we may count openwork examples as well as incised motifs, such as eagles. A scabbard chape terminal was uncovered at Binyanei Ha'uma (III.15/F.1) dating to the destruction of AD70, or possibly the period between the two revolts.

To date no sword from a Second Revolt context is known, apart from a small fragment at Tel Shalem. A copper-alloy knobbed terminal of a scabbard chape was found at a Cave 349 in Nahal Arugot in a Second Revolt context (V.23/F.1). Swords are twice noted in the letters of Shimon Bar Kosiba, the revolt's leader (Mur. 45 and Hev. 54). In the first, the Hebrew term – חרב = *herev* – is mentioned, while in the second letter, signed by one of Bar Kosiba's assistants, the commanders of Ein-Gedi are ordered to make sure not to be negligent in the removal of the sword from one Joshua Son of the Tadmorian. In the latter, the Aramaic term – סיפה = *sifa* – was used. In document P. Se'el. 6, the term חרב גאות ('sword of majesty', 'triumphant sword' or 'sword of boast') is mentioned.

Both terms, *herev*[5] and *saif* (or *saifa*), designate swords in the Jewish sources. The prevalence of the Greek in Judaea was such that in the late Roman period the term used for sword was still the *makērin* = *μαχέριν* (*μάχαιρα*).[6] According to the *Midrash*: 'Greek tongue is that one calls the swords *makērin*' (*Tan* va'yehi 9).[7] Additional reference is made to short swords = קונדא מכירין (*Gen R* 88.3). Interestingly, one of the blades from Masada (1138-1362/3) seems to be backed, however, the tapering point appears to suggest that it is rather a blade of a *gladius*, and the backed cross-section is the result of corrosion. Nonetheless, straight-backed daggers were used in Roman Palestine (pp. 112-113). Josephus's narration of the humiliation of judges in Jerusalem, being beaten by backs of the Zealots' swords, appears to suggest the use of backed edged weapons by the rebels (*BJ* 4.344). This information may shed light upon the discovery of a *μάχαιρα* blade (or *kopis*) at Dura-Europos (James 2004, 139, 140, No. 523). James interpreted the find as an 'heirloom or residual' (*ibid.*, 140). However, if the terminology in the rabbinical sources reflects the reality of its period in the east, this find may in fact interpreted as an evidence for a long lasting tradition of use, a local survival of the type (*ibid.*).

The metal blade of the sword demanded a constant treatment (pp. 253-254). Swords were prone to rust, therefore at times the blade had to be filed. Details concerning the process and tools employed are to be found in the rabbinical literature (T Kel BM 3.10; Kel 14.5).

[5] The word 'sword' designated also part of the plow (Kel 21.2) that was in the shape of a sword.
[6] *Lehn. II*, 338.
[7] Machaerus (JR) appears to be named after *μάχαιρα*.

The sword was considered as a tool of destruction. It was forbidden to carry a sword in the public domain during the Sabbath (Shab 6.4). Indeed, all bladed weapons were considered in the *Mishnah* impure: 'The sword, and the knife, and the *pugio*, and the spear... – here are impure' (Kel 13.1). Roman soldiers were notorious for their frequent ill use of arms against the local population. The Sages provided instructions for the pedestrians who took to the road, explaining how to avoid the danger of the intimidating Roman sword and rod (T AZ 3.4). Hence, walking to the side of a Roman soldier that is armed with a sword you should take his left side ('puts him at his right hand'), while if he is holding a club you should walk to his right (PT AZ 2.1 9_b). The sword is further noted as the arm used by the Romans for punitive decapitations (Sanh 7.3), as well as by the Jews (*BJ* 6.361).[8] The *Tosefta* emphasises that it is the only arm allowed for such an action (Shan 9.10). The fear of being killed in battle by the Roman sword is explicitly embodied in the ostraca from Jerusalem of the first century AD, possibly towards the year AD70 (Eshel 2003, **IN 1**):

'Unfortunate (and) poor
that something bad
in all A...D... ...H
Mattathias, not <by> sword
Peace, in Peace'

The sword was commonly used to indicate sovereignty, as the idiom 'sword of majesty' demonstrates (P. Se'el. 6). The symbolic place of the sword is further embodied in the words of Eleazar Ben Ya'ir: '...while those hand are free and grasp the sword let them render an honourable service' (*BJ* 7.386). Josephus ascribed Roman military superiority to severe discipline, among other factors (*ibid.*, 3.102-104). The *Midrash* provides an additional viewpoint to the Roman *disciplina*: 'R. Isaac said: When a king administers an oath to his legions, he does so with a sword, the implication being, whoever, transgresses these conditions, let the sword pass over his neck' (*Lev R* 6.5).

Few artistic representations of swords are documented in Israel. One must be cautious using this source, as the sculpted medium tends to feature anachronistic traits, at times executed in a very schematic way, which do not necessarily reflect reality. The palm-tree was a popular ornamental motif on Jewish ossuaries (Rahmani 1994, 48-49). One such stylised representation was transformed, by the addition of a ribbed handgrip topped by a round pommel to the trunk, into an edged arm (**Fig. 17: 1**). It is tempting associating this weapon with the *gladius*, due to the short dimensions and the ribbed grip. Still, one finds the latter element equipping daggers as well (Unz and Deschler-Erb 1997, No. 182), although lacking a

[8] As a suicide committing tool: *AJ* 14.357.

pommel. Less reliable are the triumphal and ritual associated sources, like the capitol from the site of Legio that exhibits schematic depiction of four swords (**PL. V.3B: 1**). In addition, edged arms equipped several sculptured gods or heroes. Two swords are depicted on statues from Caesarea (**PL. IV.1: 2; IV.1A: 1**), while swords are described upon the muscle armour of Hadrian's statue from Tel-Shalem (**PL. V.2: 1-2**; V.2/B.1).[9] To this evidence we may add a human-size relief of a god/governor/hero figure from Nahal Khezib (Frenkel 1986) (**Fig. 17: 2**). Frenkel merely suggested the Hellenistic period as a *terminus ad quem*, yet the posture of the figure with a raised right hand, which presumably grasped a *hasta* may hint to a Roman tradition. An Egyptian terracotta statuette has been interpreted as depicting Hadrian pointing an unsheathed *gladius* against a possibly Jewish captive, who holds a small dagger (**Fig. 19: 1**).

(a) Swords

Gladius

The ancient historical sources indicate the Roman adoption of an Iberian sword during the late 3rd century BC. A Polybian fragment from the *Suda* illustrates this process:

> 'The Celtiberians by far surpass other people in the fashion of their *machairai*. This has an effective point, and a powerful down-stroke with either edge. For this reason the Romans discarded their native sword after the wars with Hannibal, and adopted the Iberian weapon. The adopted the form, but the actual quality of the iron and the process of manufacture they were quite unable to reproduce' (*Suda*, s.v. *machaira*).

The Iberian sword is further noted by Polybius (*Hist.* 6.23), and by Philo Mechanicus (*Belopoecia* 4.71). Titus Manilius is noted to be equipped by '*Hispano cingitur gladio ad propiorem habili pugnam*' (Livy 7.10.5). Interestingly, the Spanish origin of the sword is attested also in eastern sources. The *Targum* to the Former Prophets of the Bible uses, on at least four occasions, the Aramaic term אספניקי (*ispāniqê*), as a translation to the Hebrew word חגורה (2Sam 18.11, 21.16; 1 Kings 2.5) and חגור (2Sam 20.8), both of which denote a 'sword'. Gordon has convincingly demonstrated that the origin of the Aramaic term is a translation of the Greek for 'Spanish', hence a rendering of the *gladius hispaniensis* (Gordon 1985, particularly p. 497). For two early eastern specimens see below.

Describing the panoply of the Roman *hastati* Polybius writes that:

[9] Gergel claimed that the torso is Hellenistic in origin (1991).

> 'Besides the shield they also carry a sword, hanging on the right thigh and called a Spanish sword. This is excellent for thrusting, and both of its edges cut effectually, as the blade is very strong and firm' (*Hist.* 6.23).

The construction of a double-edged blade with a prominent point made the Roman infantry sword a most efficient killing tool. According to Polybius, the Roman soldier was trained to kill his foe by thrusting rather than by slashing (*ibid.*, 3.114), although Tacitus recommends to 'strike at the face with your swords' points' (*Ann.* 2.14). Yadin has demonstrated that the term כידן (*kidhon*), which appears in the War Scroll (1QM, V.12, 13), designates a sword rather than a spear (Yadin 1963, 124-131). His conclusion that the sword was akin to the Roman *gladius*, has provided further support for his dating of the document to the Roman period. Nevertheless, as swords akin to the *gladius hispaniensis* were evidently in use by Hellenistic armies in the 2nd century BC (Stiebel 2004a), this type of weapon cannot serve as an evidence for Early Roman dating. As will be discussed elsewhere, other details of the sword's construction and fittings clearly indicate a Hellenistic tradition. In a recent study Sekunda has demonstrated that in face of the Roman military success, the Seleucid and Ptolemaic armies adopted, during the mid-2nd century BC, both Roman tactics, organizational principles and equipment (Sekunda 2001). The sword from Jericho and the Egyptian example from Defenna appear to reflect the diffusion of Roman weaponry into the Hellenistic arsenal during this period of transition (Stiebel 2004a).

The mid 2nd century BC sword from Jericho was produced from a rod of wrought iron of square or rectangular section, which had been forged while white-hot to the required shape. Following this was the hardening of the cutting edges by final hammering.[10] These technical particulars are remarkably close to the description found in the War Scroll of the production of the sword's blade and the heavy spear's head (V, 10-11).

Until very recently only few examples of the *gladii Hispaniensis* (also referred to as 'Mainz' type) were known (Feugère 1993, 140). Yet, a large number of Republican swords have recently been published and thoroughly discussed.[11] The early *gladius* was further employed in Judaea during the Herodian period (37-4BC). Altogether, three such sheathed swords have been unearthed in Palestine: in *Beit Caiphus* and the Upper City – Jerusalem, and at Masada. The lengths of the blades are: 730mm, 596mm and 610mm respectively. The sword from Masada was set in an iron scabbard, while the example from Beit Caiphus was found in its intact leather, wood and copper-alloy scabbard. The presence of the *gladius Hispaniensis* at Masada deserves an additional discussion. Found in the conflagration layer

[10] Conservation Laboratory record by Ms. Leon-Gonzalez. I thank Ms. Theofanopoulou (UCL), for providing me this information.
[11] Feugère 1993, 97-100; *apud* 1994b, 3-23; Connolly 1997, 49-56; Horvat 1997, 113, Fig. 10.2; Vincente Punter and Ezquerra 1997, 194, Figs. 33 and 34 (bottom); Iriarte *et al.* 1997.

that scorched part of the storerooms at the very end of the revolt, the sword may be presumed to belong to one of the rebels. Nevertheless, its characteristics clearly point to an earlier date of manufacture. Hence, it may well be a remnant from the arsenal of Herod, that was stored in the immediate vicinity. According to Josephus, the King's arsenal fell into the hands of the *Sicarii* during the initial stage of the revolt (*BJ* 2.433-434). Alternatively, bearing in mind the long duration of the existence of arms, it might represent an heirloom, which came down to the hands of one of the rebels (p. 251).

Turning to the First Revolt, Josephus noted that the Roman legionaries 'are armed with cuirass and helmet and carry a sword on either side; that on the left is far the longer of the two, the dagger on the right being no longer than a span' (*ibid.*, 3.93-94). It is commonly accepted that among the legionaries this order is reversed, though it accords well that of the centurions and some of the standard-bearers (Leander Touati 1987, 50, note 231; Robinson 1975, Pls. 462, 465). The remains of four blades were unearthed in the rebels' dwellings at Masada: one Mainz-type sword, two double-edged blades (*gladii*) and a dagger.

The existence of the Roman short sword, Pompeii-type, is attested in a small sized scabbard chape from Masada (III.19/F.19). Although recently claimed to be the chape of dagger sheath ('dolch ortband') (Mackensen 2000, 136), the chape's shape and the parallel from Rottweil (DE) (Ulbert 1969, Abb. 4), which features identical proportions[12] and possibly the chape from the *oppidum* of Aumes, Hérault (FR) (Feugère 1993, 146), indicate that the specimen sheathed a sword rather than a dagger.[13] Elongated points are indicative of late-republican swords (*ibid.*, 140). The pool of evidence discussed below, in particular from the First Revolt, reflects variability in the width of blades and the length of their points, which were used concurrently. The range of the scabbard chape widths from Palestine varies between 80mm at Gamala (III.3/F.10) to the smallest example of 33mm from Masada (III.19/F.19).

In addition, the site of Masada has yielded the typical ribbed handgrips (pp. 115-116), while numerous scabbard fittings are reported both from Gamala and Masada (p. 117ff).

Spatha

In his detailed description of the Roman soldiers equipment, Josephus notes that the 'cavalry carry a large sword on their right side...' (*BJ* 3.96).[14] The two-edged long slashing sword had a relatively thin iron blade, which terminated in a short point (Bishop and Coulston 1993, 71-77). No *spathae* from the early Roman period are known from Roman Palestine. Though initially published as a *spatha* (Magness 1992, 64), a close examination of a sword from Masada revealed that it was rather a *gladius Hispaniensis* (III.19/F.1). Still, a group of

[12] Masada chape: 85x33mm; while the complete object from Rottweil is: 90x32mm.
[13] *Cf.* the size of the chape from South Shields (UK) (Allason-Jones and Miket 1984, No. 3.396).
[14] *Cf. Vetus Latina*, 2 Sam 21.16.

bone and ivory handguards with V-like decoration was recovered at Masada (III.19/F.12-15). This element that is discussed below indicates the presence of horsemen at the site, possibly prior to the revolt (pp. 116-117).

In the second century AD the long sword – *spatha* – became the dominant type, throughout the Roman Empire (Bishop and Coulston 1993, 71, 74; Feugère 1993, 147ff). Several examples were unearthed in Palestine in 2nd century AD contexts: one sword from Kh. Tannuriyye (V.1/F.1), while two more unpublished examples are found in the collection of the IM. It is indeed the dominant type in 3rd century AD Dura-Europos (James 2004, 140-143). This shift is well reflected in the Jewish rabbinical sources, as the swords are referred to as אספתי (*ispathi*) alone (Kraus 1899, 94-95). The small 'sword' that was used by the weavers for the separation of the warp was called אספתי (*ispathi*), possibly due to its outlines' resemblance with those of the sword (Ohal 13.4).

(b) Daggers and knives

The dagger or the short sword was the sidearm of the Roman soldier (*BJ* 3.94). The double-edged *pugio* seemingly functioned as a backup weapon, intended for use in a face-to-face combat according to the circumstances of battle, or following the loss or neutralization of the sword. This function is also testified by the etymology of its name (root *pug* of *pungo* (*LS*, *pugio*); *cf. pugna*). Nevertheless, in Palestine, where guerrilla rather than orderly military tactics were very much common, daggers had a slightly different role. During the period of the Second Temple the Jewish nation was torn by internal political and ideological conflicts. Political assassinations were not unknown in Palestine. The small dimensions of the dagger, which enabled a full concealment under the assassin's clothes, made it a favourable killing tool (*AJ* 15.282, 288; *BJ* 2.254; *AJ* 20.186, 164; also *ibid.*, 14.291, and *Vita* 293). This is of course not to say that Rome was unused to the employment of daggers in political assassinations, as the Ides of March demonstrated. However, the dagger did not perform, in the local forces, the same 'rigid' function it had in the institutionalised Roman army. When Palestine came under Roman government, later to be followed by small-scale clashes and two revolts, the 'native' dagger became an ideal arm to be secretly carried by the Jewish resistance.

*The Roman military dagger (***pugio***)*

The evident resemblance of the Republican Roman sidearm with the native Spanish dagger suggests an Iberian origin. It has been argued that the Romans adopted the Spanish dagger, with its waisted blade, double disc handle and frame sheath, around the siege of Numantia (133BC) (Connolly 1997, 56-57). These traits lasted throughout the 1st century BC, but are more extensively represented in the Late Republican period (Bishop and Coulston

1993, 54-55), as the examples from Alésia (FR) and Oberaden (DE) (Connolly 1997, Fig. 13) and the funerary art, like the Padova centurion (IT) (Keppie 1991), testify. During the Early Principate the Roman military dagger underwent several modifications, among which we may note the changes of the tang and handle, the blade (Types A-C) and the adaptation of the richly decorated all-metal sheath (Scott 1985, 152-154; Bishop and Coulston 1993, 74; Obmann 2000). The dagger is frequently associated with the legionaries, yet its appearance upon auxiliary funereal representations suggests that it was employed by all soldiers (Scott 1985, 153, note 1).

Listing the Roman soldier's equipment during the time of the First Revolt, Josephus notes the dagger once. Described as equipment of the infantry legionaries, it is referred to as a sword (*ξίφος*), 'being not longer than a span' (*BJ* 3.94).[15] Commonly calculated as 9in long (250mm), this measure concurs well the lengths of excavated blades, which varied between 250 and 350mm (9-14in) (Bishop and Coulston 1993, 76). This attitude to the arm as a short sword further occurs in Josephus's narration of the local daggers as *μικρα ξιφίδια* (*BJ* 2.255). In addition, Josephus uses the standard term *ξιφίδιον* (see Appendix 2). In the rabbinical sources the dagger is designated by the word פגיון (*pigyon*), which clearly derives from the Latin *pugio* (Krauss 1899, 421). Wicked employment of the *pugio* by a Roman *quaestor* is noted in the *Mishnah* (Bek 5.3). The *pugio* was excluded from the list of arms that were prohibited to be carried on Sabbath (Shab 6.2, 4), but was evidently in Jewish usage as it is noted elsewhere in the *Mishnah*, *Tosefta* and the *Babylonian Talmud* (Kel 13.1; T Hul 1.8; BM 84_a). The former source notes the 'תיק הפיגיון' – 'sheath of the *pugio*' (lit. 'bag of the *pugio*') (Kel 16.8).

Only two clear remnants of the Roman *pugio* have been recognised to-date in Palestine (for the *pugio*'s sheath fittings – pp. 120-121). At Gamala, the characteristic iron handle of the inverted T-shape formed part of Lucius Magus's panoply (III.3/F.2). In addition, a distal part of a blade (Type A) was found at Jotapata (III.2/F). The remnant of the tapering blade has a rhomboid section, with a central midrib (*pers. observ.*). A possible additional dagger hilt element is a wooden ribbed handle found at Masada (III.19/F.10). Both its ends are worked, indicating that the object is complete. The very short length (53mm) seemingly indicates that the handgrip was part of a dagger, rather than a sword, like the wooden example from Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 182, Taf. 10). If indeed so, the ribbed handgrip furnished both *gladius*, *spatha* and at least one type of Roman dagger's hilt.[16]

[15] According to Josephus, the dagger hung from the soldier's right waist and the sword from his left – reversed to the commonly accepted arrangement.
[16] Decoration grammar: Künzl 1998, 277 and Abb. 12.

'Native' daggers

Blades that do not exhibit the above detailed typical characteristics of the *pugio* and are of more heterodox forms are commonly classified as a 'native' type or an auxiliary arm – see the dagger from Mehrum (DE) (Bishop and Coulston 1993, 76, 78) and Kingsholm (UK) (Scott 1985, 159, V.19). We may add to this group the much corroded dagger from Masada, which features tapering, seemingly double-edged, outlines (III.19/F.5) with a 190mm long blade. The latter neatly parallels a group of daggers from the region north of the Alps, with examples from Bollène (FR), Bavière (FR), Wehringen (DE), August (FR), Saône (FR) and Künzing (DE) (Feugère and Alfonso 1997, 19-20).

In addition a double-edged, elongated and narrow bladed dagger was found at Mo'a (IV.4/F.1). The length of the blade is 345mm. Its context suggests a Roman military association, presumably of Nabataean auxiliary force (p. 114). The very scant representation of these daggers throughout the empire may cause isolated identification of 'native' types, when in fact the examples from several Provinces share common traits and may reflect the existence of additional types, which were less prevailing – like the backed dagger (see below). According to Josephus the Jews used daggers *ξιφίδια* (*AJ* 5.190, 193; 14.291; 15.282; 20.164, 186; *BJ* 2.254; *Vita* 293). He was clearly not careful with his terminology as he next refers to the daggers in *AJ* 15.282 as *ξίφη* (*ibid.*, 15.288).

Straight-backed dagger

One example of a straight-backed dagger was found at Nahal Yattir Site (V.33/F.1). Typified by a narrow straight-backed blade, the dagger has one sharp edge. Its tip is formed by the back running down to the edge and is seemingly less apt for stabbing. Parallels are reported from Volubilis (MR) (Boube-Piccot 1994, 151, Nos. 278, 276 (?), Pl. 29).[17] It seems to date to the Second Revolt (AD132-135) and being found in Tomb 4, it represents in all likelihood the local arsenal. Its slightly curved working edge suggests the blade was sharpened (pp. 253-254). The length of the blade from Nahal Yattir is 230mm (up to the fastening pin).

Sica

One of the Jewish forces to take part in the framework of Josephus's narration of the First Revolt was a group known as the *Sicarii*. They were notorious for employing short curved swords (*sicae*) for political assassination of their rivals; this arm granted them their name:

[17] Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 1.4) and Strassburg (FR) (Forrer 1927, 529, Abb. 394).

> 'Upon Festus's coming into Judaea, it happened that Judaea was afflicted by the robbers, while all the villages were set on fire, and plundered by them. And then it was that the *sicarii*, as they were called, who were robbers, grew numerous. They made use of small swords, not much different in length from the Persian *acinacae*, but somewhat crooked, and like the Roman *sicae*, as they were called; and from these weapons these robbers got their denomination; and with these weapons they slew a great many' (*AJ* 20.185-186).

The interesting use of Persian terminology – *acinaces* (*acinacis*), appears to suggest some degree of exposure to Persian *militaria* in Palestine (p. 217). Very few *sicae* are known from the Roman Empire. In addition to the artistic representations of the weapon as equipping gladiators (Junkelmann 2000a, Figs. 20, 39; Ewigleben 2000, Fig. 150), merely one, wooden, *sica* is reported from Oberaden, as a training arm of gladiators (**PL. II.1: 3**; von Schnurbein 1979).[18] Among the unpublished material from Cave 2, at Nahal David, I have identified an iron-sheathed dagger (**PL. I.8: 2**; I.8/F.1). Missing most of its tang, the blade suffered from corrosion, hence it has a slightly swollen section. Nevertheless, the double-curved blade leaves no doubt as to its classification – a *sica*, exhibiting an overall resemblance to the Arabic *shabériya*. The blade was set in a curved U-guttering frame, one arm of which is missing. The distal part of the frame was looped out, allowing the suspension of the sheath. The front part of the sheath was decorated by medial triangular stem. The iron frame was probably wrapped with an organic material, most likely leather which has not survived.

Nabataean daggers

The Nabataean figurines of the military camels, exhibit sheathed edged weapons that hang from the animal's saddle. The detailed depiction of a figurine from Oboda (**Fig. 18: 1**) portrays a dagger with a three-lobate pommel, shouldered blade and a U-guttering frame with two suspension extensions (loops) and a bulbous terminal. The distinct triple lobate pommel suggests that these Nabataean daggers were influenced by the Roman late-republican daggers that prevailed in Italy – Tarent (IT) (Obmann 2000, Taf. 2.7) – which are represented on late-Republican coins (*ibid.*, Abb. 1-3), and the pommel of the sword on the celebrated tombstone from Padova (IT) (Franzoni 1982; Obmann 2000, Taf. 59: 1-2). It thus appears that the late Republic, the era of the first encounter between the Romans and Nabataeans, was the period during which the Nabataeans adopted this motif and in all likelihood the weapon as well (p. 221ff). As noted above, the dagger from Mo'a, may be assigned to a Nabataean unit.

[18] Possibly a gladiatorial discharged symbol (Suetonius, *Claud.* 5, 21; Horace, *Epistles*, I.1.2; *cf.* Coulston 1999, 5-6).

Gladiatorial dagger

Daggers constituted an integral part of gladiatorial equipment (Junkelmann 2000a, 58, Figs. 37, 27, 117-118, 122, 128, 135, 139). The outline of a bone brooch from Tiberias (IL) (Ayalon and Sorek 1999, 31, Fig. 30), demonstrates that it was clearly designed after a dagger (**PL. II.1: 2**; II.1/P.1). The brooch's curved head bears a great resemblance to a dagger handgrip. This gripping assemblage type, of a semicircular pommel crowning a handle and a semicircular hand guard, is typical to gladiatorial edged arms. The brooch is identical in shape to a straight edged dagger illustrated on a Roman lamp, which is accompanied by additional gladiatorial equipment (Junkelmann 2000a, Fig. 20). The wooden *sica* from Oberaden, exhibits an identical gripping assemblage (**PL. II.1: 3**; von Schnurbein 1979). Thus, the design of the gladiatorial dagger seemingly stood in front of the brooch producer's eyes.

Clasp-knives

Browsing the personal gear of soldiers in modern armies one would surely find there a version of a clasp-knife. Though it is not an exclusive military item, such a knife would prove useful in military life.[19] Indeed, a clasp-knife was unearthed in the Roman camp at Saalburg (DE) (Jacobi 1897, 437, abb. 68:16) and Strasbourg (FR) (Forrer 1927, 515, Fig. 384: D).[20]
In Israel, a clasp-knife, similar to the Saalburg example, was found in The Cave of Letters at Nahal Hever (**PL. V.24A: 2**). Though the context of the find is seemingly civilian, its characteristics may shed light on similar objects in military use. It has an iron down-turned blade and a wooden handle. The length of the open knife was *c.* 20 cm. Its dull edge is of convex shape, and when folded it slightly protrudes (*ibid.*, Fig. 31, Pl. 24 – right). Additional blades were found in the Necropolis of Beit She'arim (Mazar 1957, 150, Ill. 25: 12) and at Gezer (Macalister 1912b, Pl. XCVI).
Three knife sheathes were uncovered in the Sandal Cave (V.14/F.1), the Cave of Letters (**PL. V.24A: 1**; V.24/F.1) and in Cave 38 (V.29/F.1), all in Second Revolt contexts (p. 121).

(c) Hilt Fittings

The handle assemblage of an edged weapon comprises the grip, handguard and pommel. The ribbed design of the Roman handle is distinguished by its practicality, intended to provide a firm grip (many of the handles exhibit an octagonal cross-section). Furthermore, unlike the Hellenistic sword handle, which was commonly lavishly decorated (*cf.* the Greek sword (Künzl 1997a, Abb. 5), the sword from the Philip's tomb, Vergina (GR), or the dagger from Tel Zorer (IL) (Ohata 1967, 10, Pl. L: 5)), the Roman handle lacked much decoration.

[19] We may also add the razor (ξυρόν) (*AJ* 16.387 and *BJ* 1.547).
[20] Knives in military employment: Junkelmann 1997, 101, Taf. XVIII. 2, 3, III. 2 and Abb. 51.

Ribbed handgrips

One of the earliest examples of a ribbed handle, which equipped a *gladius Hispaniensis*, was reported from Defenna (EG) (Petrie 1917, E 41). Compared with a Hellenistic *gladius* from a tomb in Jericho, both swords appear to date to the mid-2nd century AD (Stiebel 2004a). Fragments of six handgrips were uncovered at Masada, three of which derive from the complex of the Western Palace. All grips but one are made of bone, while the additional example is of wood (above, p. 112). These specimens belong to the well-defined ribbed type, customarily associated with the *gladius* (Greep 1984, 122-123), although it could have theoretically been used for the long cavalry sword as well (see Deschler-Erb 1999, 25ff). Three bone examples share the characteristic octagonal cross-section. The grips are too fragmentary to determine whether they were indeed produced from cow's longbone as the evidence in the Roman west shows rather conclusively (Greep 1989, 20; Bishop and Coulston 1993, 71, 193). Complete examples are recorded throughout the Empire, the majority of which are made of bone, though several wooden grips are also reported.[21] The Mainz-type sword from the Jewish Quarter of Jerusalem, still exhibits the remnants of the handle – 90mm long. As noted above, an edged weapon with a ribbed handle is depicted on an ossuary from Bet Zayyit (**Fig. 17: 1**).

Handgrips of daggers

A bone model dagger from Tiberias (**PL. II.1: 2**; II.1/P.1) was modelled after the outlines of the gladiatorial dagger, with its characteristic semi-circular pommel and handgrip. These features are identical to those of the *sica* from Oberaden (**PL. II.1: 3**). The short wooden ribbed handgrip from Masada (III.19/F.10) could have very well served a dagger rather than a sword. As noted above such a ribbed handle equipped a dagger from Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 182).

Handguards of spathae

Four handguards with a V-decoration were found at Masada (V.19/F.11-14). Three are made of bone and one from ivory. A DNA sample was extracted from one of the Masada group of handguards (L1273-1717/1). The sequences obtained suggest that it was produced from a bone of an 'ancient goat' (*Capra hircus*) (Kahila Bar-Gal 2000, 64-65).

These examples belong to a growing group of handguards, attested on several western sites. At Rheingönheim (DE) there are two such objects (Ulbert 1969, 59, Abb. 6: 1-2 and Taf. 60: 1-2), three specimens have been reported from Vindonissa (CH) (Unz and Deschler-Erb 1997,

[21] Bone handgrips: Unz and Deschler-Erb 1997, 15, 25-43; Greep 1989, 20, Figs. 3-5; Ulbert 1969b, 97-99, Taf. 17, Abb. 1, 3, Taf. 18, Abb. 1a-b; Greep 1984, 122-123; Gerhartel-Witteveen & Hubrecht 1990, 99, 102, Figs. 2-4; Boube-Piccot 1994, 142-143, nos. 234-236; Vanden Berghe 1996, 84, 86, Fig. 15: 2; Feugère 1997, 3-6, Fig. 2: 1-3.

Taf. 2: 22-24)[22] and two from the area around Mainz (DE) (Lindenschmit 1870, H.2, 4 and Taf. 3, 6b). One further example is reported from Augst (CH) (Deschler-Erb 1998, 175, Taf. 41: 4000). It appears that this handguard was confined to the *spatha* as observed on Trajan's Column – scene XXXVII (**Fig. 18: 2**).[23] This element appears on a 1st century AD cavalry tombstone from Cologne (DE)[24], and is represented in 4th century AD Nijmegen (NL)[25] and equipped a 4th century AD long sword from Cologne[26], indicating the long duration of this design.

Compared with other sites in the empire, the rare representation of four examples at Masada stands out. It is why I believe this homogeneous group should be assigned to one unit that occupied the site at a given period of time rather than been coincidently stratified on varied occasions. The unique presence of these finds at Masada raises the question of their origin. Though legionary riders were evidently present at Masada during the siege, as testified by P. Mas. 890, as well as presumably auxiliary horsemen, it is highly unlikely that so many swords were left behind as a result of the battle of AD73/74 or after the revolt (Garrison B). Discovered at the rebels' dwellings, the only plausible explanation appears to be the association of this group with the presence of the auxiliary unit that manned the fort until AD66.[27] For residence, the soldiers seemingly used part of the Herodian buildings, like building No. IX. The palaces were presumably closed, reserved for high-ranking officials (like the procurator?). The only clear archaeological evidence for their presence was discovered in the building which was transformed into a synagogue during the First Revolt (L1042-1043). The thick dung layer discovered there, above the Herodian level and below that of the rebels, suggests that the structure was used as a stable by the soldiers of Garrison A (Yadin 1965, 77; *Masada* III, 409, Ill. 646).[28]

An as yet unsolved question is the nature of the plugs that were seemingly used to seal the lateral openings of this handguard. Some of the bone roundels, which are commonly found in military contexts, may be so identified – for example the floral discs from Rheingönheim (Ulbert 1969, 51, Taf. 45: 4-6 and Taf. 60: 5-7).

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[22] No. 22 is presented upside down.
[23] It was following the writing of this chapter that I came across Deschler-Erb's publication in which the same parallel was drawn (1999, 26, Abb. 19)
[24] Feugère 1994, 102; Nijmegen 1995, 16: 1.
[25] Gerhartl-Witteveen and Hubrecht 1990, 99, Fig. 2; Greep 1984, 122.
[26] Couissin 1926, 490; Petrikovits 1967, 23; Tomlin 1981, 260; Dixon and Southern 1992, 48-49, Pl. 6.
[27] Can one link the carefully curved ivory example with the unit's *decurion*, and the bone examples with the plain soldiers?
[28] The *tituli picti* noted by Rea (1999) may be a wine shipment to this unit.

Pommels

The two bone pommels from Masada feature crossing drilled holes and are decorated by a typical incised horizontal groove (III.19/F.16-17). Such a groove decorates objects from Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 2, Nos. 8-11). The two polished objects suffered much from fire as attested by their black scorched body. A possible metal pommel fitting – 'Nietknopf' – was uncovered at Gamala (III.3/F.3).

(d) Scabbards, sheaths and fittings

The scabbard and sheath appear to have two functions: the primary one is to enable the carrying of the edged weapon without being cut from its blade, while allowing its smooth drawing. In addition, like many other items of *militaria*, its shape and decoration indicate the status or the unit of the bearer, whether by exhibiting the emblem, or title, of a Roman unit or assigning for example the carrier of the curved *sica* to the *Sicarii*. The archaeological testimony indicates the use of scabbards and sheathes by the local population, like the sheath of the *sica* from Ein-Gedi (p. 120). Several sheathed edged weapons were found, the best preserved example of which is a sheathed *gladius Hispaniensis* from Jerusalem (I.7/F.1) that still retains its wooden and metal components and the four suspension rings. Both copper-alloy and iron was used in the production of the scabbards. In addition, wood and leather were employed to produce the body of the scabbard. A unique red painted leather *vagina* was unearthed at Masada (III.19/F.18). The metal parts were commonly decorated by tinning and silver-plating, the aggressive chemical cleaning of which have resulted in the removal of such coatings.[29] Open-work decorations were especially common with the 'Mainz' type, and later replaced by embossed motifs (Bishop and Coulston 1993, 71). Mounts and locket plates were embossed, while the cast reinforcement mounts exhibit cabled ribs, to the ears of which cast suspension rings were attached.

The *Mishnah* refers to the three types of scabbards and sheathes: 'sheath (lit. bag) of the sword and the knife and the dagger (*pugio*)' (Kel 15.8), hereby discussed.

[29] *Cf.* Appendix 1.3 (*e*).

Sword scabbards

The Hellenistic mid-2nd century BC *gladius Hispaniensis*-like swords from Jericho and Daphne (EG) were sheathed in an U-guttering binding which had a circularly-shaped terminal, rather similar to that of the Celtic swords (Stiebel 2004a). The Jericho scabbard was made of iron while the Egyptian example was produced from copper alloy. The tapering U-guttering binding construction was used for the Mainz-type scabbards as well, as the ferrous example from Masada demonstrates. The complete sword from Beit Caiphus consists of an iron U-guttering frame to which adhered a wooden layer coated by leather (**PL. I.7: 3; I.7A-D**). The sword had four copper-alloy attachment rings. The graining of the wood indicates the use of elongated planks, seemingly of plywood, which were laid longitudinally. The corroded granulation of one plank indicates the width of 25mm (**PL. I.7B: 1-2; I.7C: 1**). Three horizontal copper-alloy bands, decorated by embossed designs, reinforce the lower half of the scabbard.

Josephus explicitly notes the drawing of a sword by a rebel officer (*BJ* 6.361). Like the adjacent rulings, the *halachah* which detailed the 'sheath of the sword' (Kel 15.8), appears to deal with leather items, hence reflecting the dominancy of this component. A red painted leather scabbard was found at Masada, manifesting a delicate open-work decoration. A possible additional example is reported from the Murabba'ât caves (V.16/F.1).

A wealth of scabbard fittings has been found in the First Revolt battle sites, most notably Gamala and Masada. The scabbard chapes are made mainly of copper alloy but a few ferrous examples are documented as well. All feature U-guttering frames, which are commonly assigned to the Mainz-type (Bishop and Coulston 1993, 71). Copper-alloy fragments of this binding were uncovered in Gamala (III.3/F.12-14) and Camp F, Masada (**PL. III.20B: 4**).

The Pompeii-type's scabbard had an ornamental locket that manifested, in open-work technique mythological scenes, an example of which was found at Masada (III.19/F.21). The openings made the darker colour of the underneath leather or wooden lining visible, thus emphasizing the scene's features.

The two pairs of suspension loops allowed a variety of belting modes. A rare example of a leather leash, a fragment of which survived still attached to such a loop, together with part of the fragment of the leather scabbard, were uncovered at Gamala (III.3/F.23). The loops were attached to looped mounts that commonly exhibited reeded decoration on their upper surface; some of the raised cabled ribs were embossed while others are cast. Along the length of the scabbard's body mounts were spaced, like the three bands that are discernible on the scabbard from Beit Caiphus (I.7/F.1); most are decorated by embossed dots, floral and fishbone designs.

Turning to the scabbard chape few complete examples were found at both Masada and Gamala. The small example from Masada (III.19/F.19) was decorated by a *pelta* and heart-like motifs in openwork (**PL. III.19Q: 1**). A central palmette element ornaments chapes from Gamala and Masada, and some of the examples are tinned (**PL. III.3AE: 5; III.19R: 3**). The site of Gamala yielded scabbard chape palmette-ends as well (**PL. III.3AF: 1-2**).

A front plate was set into part of the scabbard chapes. Such a plate from Gamala exhibits a dense decorative scheme of incised triangles and circles (**PL. III.3AB: 3, AC: 1**). Although repeatedly described as gilded, tests have proven that the shiny appearance is the result of an over zealous chemical cleaning (Appendix 1.3 (*e*)). The *aquila* – the legion's emblem – appears on an additional chape's plate (**PL. III.3AB: 1**). The eagle is presented, with spread wings, in incision and *punctim* techniques. An additional representation of an eagle, executed in open-work, that decorated such a plate is further reported from Gamala (**PL. III.3AB: 2**).

A lavish open-work ornamentation of a leather scabbard chape from Masada comprises of two perpendicular columns of thin rectangular slits (**PL. III.19P: 1**).

Several knobbed terminals of scabbard chapes were uncovered, the latest example comes from a Second Revolt refuge cave at Nahal Arugot (V.23/F.1). This object seemingly has a leaden core, judging from its considerable weight. The bottom part of these terminals was at times round or featured a nipple-like pierced projection (III.3/F.5), while other examples exhibit a star-like decoration. This element was further subject to silver-plating (III.3/F.5).

Short swords plain scabbards

Interestingly, describing the gear of the Roman infantry, Josephus uses the phrase 'short swords' rather than the term dagger (*BJ* 3.95). Plain sheaths of daggers, are known in the west and claims were made that 'most dagger scabbards of the mid-first century should not have been decorated' (Bishop and Coulston 1993, 76). In the east, we may refer to a type, which was used to sheath short edged weapons and was seemingly unique to the orient. To this group we can assign a fragmentary copper-alloy sheath from Samaria (I.6/F.1) and a complete example in the Jeselsohn collection (VI.10/F.1). Both these examples are alien to the Roman 'standard issued' dagger sheaths. The latter is 407mm long, while the reconstructed length of the fragmentary scabbard from Samaria is 265mm. Both examples seem to fall under the category of short sword scabbards or possibly daggers. Found in the fill of the Herodian gateway, the proposed date for the Samarian example appears to be between 25 and 4BC. This early date is further supported by the suspension method used. The two asymmetric lobate suspension loops are paralleled by Spanish examples (Connolly 1997, Fig. 13B), further attested by an Augustan example from Titelberg (LU) (Metzler and Weiler 1977, Fig. 31, 1).

Interestingly, the Samaritan sheath was uncovered in direct association with a silver frog (I.6/G.2). The example from the Jeselsohn collection is claimed to have been found in a cave in the south Judaean mountains district, with no particulars that might suggest any dating with certainty. Its body is mid-ribbed and was seemingly coated by a parchment-like organic material.

Dagger sheaths

Several fragments of the typical *pugio*'s ornamented scabbards were found in Palestine (Scott 1985, 154-159). The latter is merely represented by D-shaped suspension loops from Masada (III.19/F.26-27), Gamala (III.3/F.20-21), Ein-Gedi (V.22/F.1-2). Two circular terminals from Gamala, with punched ornament of eight petalled rosettes, resemble the decorated discs terminals of the dagger sheaths: *cf.* Velsen (NL) (Morel and Bosman 1989, 183, Figs. 7-8, 9B), however they seems more likely to be pommel caps (or chamfron decorations?). The scanty assemblage may be accounted for by a limited number of excavations, but also due to a regional diversity. It may very well be that the Roman forces in Palestine armed themselves with more 'oriental' equipment. The scabbard from Samaria (I.6/F.1), for example, has a set of suspension loops different from the western tradition.

A D-shaped suspension loop from Masada (III.19/F.27) represents a very delicate and precise smithery work, whose complexity surpasses that of Velsen (NL) (Morel and Bosman 1989, 181-185, Figs. 7-8, 9B). The *Mishnah* mentions the: '*tik* (lit. bag) of the sword, and the knife and the *pigyon*...' (Kel 16.8).

As noted above, the *sica* from Ein Gedi was found with its iron sheath that features a U-guttering binding construction (above, p. 117; I.8/F.1).

Knife sheaths

Knife sheaths were found in three refuge caves of the Judaean Desert: the Cave of Letters (V.24/F.1), the Sandal Cave (V.14/F.1) and Cave 38 (V.29/F.1). They are simply made of a leather band that was folded over and stitched, with no evidence for metal fittings. The specimen from the Cave of Letters is made of thick leather, most probably sheepskin (Yadin 1963b, 165).

These rare objects can be paralleled by the three examples from the early wooden fort of Vindolanda (van Driel-Murray 1993, 49, Fig. 21, Nos. 4-6).[30] Lightly impressed lines decorate the object from the Sandal cave. The same technique was used to ornament one of the Vindolanda specimen (*ibid.*, No. 6). The fact these sheaths were decorated clearly suggests they were meant to be seen. Whether they had any social or even statutory

[30] *cf.* Baur and Rostovtzeff 1931, Pl. IXa.

significance, marking their owners as warriors or men in the same manner Near Eastern, mainly Yemenite males carry their daggers, is hard to assess at present.

(ii) Belts

The Roman military belt was primarily intended for carrying the sword and dagger (Bishop and Coulston 1993, 96, 98; Feugère 1994, 225-231).[1] In addition, as modern experiments have demonstrated, the belting of mail armour reduced the weight from the wearer's shoulders. Nonetheless, throughout Roman military history, the waist-belt (*balteum militare*)[2] had in addition to the functional importance status significance (Coulston 1998, 184). Pliny the Elder mentions the use of silver scabbards' links and silver belt plates (*NH* 33.152). The silver-plated belt mount from Masada (III.19/G.1) and the gilded frog from Legio (V.3/G.3), serve as fine illustrations to this flamboyant tendency. The ample use of precious metals and the evident emphasis upon the decoration of the mounts (Grew and Griffiths 1991) made the military belt materially valuable. In AD69, soldiers handed over their belts with the intention to raise money in favour of Vitelius (Tact. *Hist.* 1.57).

(a) Belt types

During the early Principate Roman soldiers were equipped with two belts that were worn in a 'cowboy'-like manner (Bishop and Coulston 1993, 61-62).[3] In the 1st century AD the sword and dagger were suspended from one belt alone. According to Josephus the legionaries wore their sword on their left, and the dagger on the right (*BJ* 3.95), a reference that is contradicted by the artistic representations. Josephus further notes that the Roman cavalryman wore his sword on his right (*ibid.*, 3.96). The military belt was made of leather. The length of the fastening pins of the belt mount from Herodium suggests the thickness of the leather military belt was 4mm (Stiebel 2003a, No. 4) and had the width of 28-29.5mm (III.19/G.1).[4] The leather belt was commonly ornamented with metal mounts, which also prevented the leather from curling over (Grew and Griffiths 1991, 47-84) and protected it from slashing blades. The mounts were spaced along either the entire length of the belt or just decorating its front. Lavish examples were found at Velsen (NL) (Morel and Bosman 1989, 180-181, Figs.

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[1] The *Midrash* notes the three functions of the belt, including the fastening of the sword (*Psikta Derav Kahana* 124_b).

[2] Though commonly referred to as *cingulum*, it seems that during the early Principate the term in use was simply *balteus*, for *cingulum* was little used prior to the 3rd century AD (Bishop and Coulston 1993, 96). Few references are made in the rabbinical literature to the military belt. Jastrow suggested interpreting the word *galalion* as the *cingulum* (1926, 245_a). However, even if this is true it does not necessarily indicate the military belt, as the word *cingulum* designated a belt worn by women (Varro *Ling. Lat.* 5.114).

[3] Yadin 1962, 127, Fig. 4; Shatzman 1996, 114.

[4] A textile belt that was uncovered at the Cave of Letters emphasises the difference between the local and the military belt (Yadin 1963b, No. 96 – 7.7, Pl. 99).

5-6), Rheingönheim (DE) (Ulbert 1969, 45, Taf. 32: 5 and Taf. 56 a-g) and at Herculaneum (Bishop and Coulston 1993, 98; Künzl 1977b).

Baldric

During the early Principate the baldric was presumably very little in use among the ordinary soldiers and was saved for the representation of deities and possibly for very high-ranking commanders. All the evidence for the use of the baldric are sculpted representations, presumably merely reflecting artistic conventions rather than the military *realia*.[5]

(b) Belt fittings

Belt mounts

Few examples of belt mounts have been uncovered in Palestine. The silver-plated hinge mount found at Masada (III.19/G.1) is identical to the counterpart of the famous set from Velsen (NL) (Morel and Bosman 1989, 180, Fig. 5.1, 6.1). A cast caterpillar mount is reported from the Upper City of Jerusalem, the grooves on its face still retaining niello. The origin of the object, from a Herodian floor, precedes the suggested appearance date of the type, in the 1st century AD (Allason-Jones 1989). Parallels are known for example from Corbridge (UK) (*ibid*, 10-11, Fig. 2: 1-3), South Shields (UK) (Miket and Allason-Jones 1984, 237-238, No. 3.878), Weißenburg (DE) (Oldenstein 1976, Nos. 727-729, Taf. 58), Évreux (FR) (Fauduet 1992, 106-107, Nos. 728-803). Two rosettes that were seemingly a central decoration feature of a belt-plate of the pseudo-hinged type (Bishop and Coulston 1993, 98) were uncovered at Gamala (AD67), one of which may be associated with the panoply of L. Magus (III.3/G.4-5). Both are identical in shape to the rosette feature seen in the centre of the seemingly Augustan belt-plate found in the River Lujbljanica at Bevke (SL) (Istenič 2003, 286-290, Figs. 4-5).

A unique copper-alloy belt mount was found at Herodium (Stiebel 2003a, No. 4). This object, that possibly derives from the Second Revolt, is flanked with two lateral *pelta*-shaped designs. It has a central circular depression and the bottom section is decorated with three joint openwork circles. Three tube-like shafts suspend from the latter, the body of which is bound with copper-alloy wire (17-20 times). The shafts terminate with right-angled loops that hold three teardrop pendants. The teardrop, nearly heart-shaped, pendants are convex in section, with bulbous terminal. This unique feature of a belt mount with three suspending pendants fits into the general scheme of the republican *baltei* strap-ends and the 'apron' of the Principate (below); in that respect, they both represent suspending elements which appear to

[5] See the *Tyche* from Caesarea (IL), dated to AD125 (**PL. IV.1A: 1**). In an additional representation a sword suspends from a baldric (**PL. IV.1: 2**).

have a decorative and showy role rather than a functional one. This arrangement, of suspending elements from the military belt, accords with the figurine from Linz Kreuzschwestern (AT) (van Boekel 1989, 92, Figs. 12 B-C), which depicts a soldier with several heart-shaped pendants suspended from its belt.[6] Although no exact parallel is known, mounts sharing the same principle construction of suspending teardrop pendants were uncovered in early Principate contexts at Vindonissa (CH) (Unz and Deschler–Erb 1997, 40, No. 1430, Taf. 52). Stylistically, the closest comparable material is Grew and Griffiths's type B (group 1), which dates to the Claudian period. This group includes mounts with a circular feature, in which two 'acanthus' leafs face each other like our *pelta* design (1991, Nos. 59-64).

Frogs

Roman scabbards were suspended from the belt by means of leather leashes that were attached to the shanks of metal or bone frogs. The frog consists of a circular head from which stems in right angle a shank of varied shapes, most commonly triangular or circular. It was fastened to the belt through a slit in the belt hence the frequently decorated head was visible. The shank hung behind the belt. Several representations of this arrangement are found in military funerary art (**Figs. 20: 1-3**; Ubl 1989, Abb. 5, 7). The clearest archaeological evidence for the identification of this item are two frogs that had been found in direct association with swords, in a tomb at Canterbury (UK) (Goodburn 1978, 471, Fig. 19). Similarly, the silver frog from Samaria was found together with a copper-alloy sheath (I.6/F.1). Part of these fittings is included in Wild's typology of 'button and loop' fasteners (1970).

A wealth of frogs was uncovered in Palestine, the production of which involved the employment of varied materials: copper alloy, silver, tin, niello, gold and bone. The earliest examples derive from Samaria (I.6/G.2-3), presumably dating from the 1st century AD. Some nine copper-alloy examples are reported from Masada (III.19/G.6-14). The commonest type has a triangular shank and raised concentric rings decorate the flat circular heads.[7] Two frogs feature a looped shank (III.19/G.13-14), additional examples of which were found in Camp F, Masada (III.20/G.1), Kh. Qumran (III.17/G.3), two in Gamala (III.3/G.6-7) and Herodium (Stiebel 2003a, 225-226, No. 5, Fig. 12).

The site of Gamala has yielded a lavish example of Wild's type VIIIa, the face of which was tinned and decorated by *punctim* motifs (III.3/G.6; 1970, 143, 153-154: Nos. 117-127). A rare

[6] The same arrangement appears upon several figurines from Harelbeke and Asse-Kalkoven (BE) (van Boekel 1989, 91-92).
[7] Wild's Type Va.

type was further found there (III.3/G.2), featuring a bar head and triangular shank – Wild's type IX (1970, 143). Parallels: 1970, 154, Nos. 131-135; Volubilis and Banasa (MA) (Boube-Piccot 1994, 92, Nos. 133-135, Pl. 13); Vindonissa (Unz and Deschler-Erb 1997, 55, Nos. 2103-2105, Taf. 71 – with bibliography); Aislingen (DE) (Ulbert 1959, 95: No. 27, Taf. 24). Eight bone frogs were found at Masada (III.19/G.13-20). One bone example was found in the Upper-City of Jerusalem (III.12/G.2), as well as at Gamala (III.3/G.3; below).

Turning to the 2nd century AD, three frogs were uncovered in the surveys at the site of Legio (V.3/G.1-3), one of which is gilded. A frog from Herodium (Wild's type VIIIa) seems to date from the Second Revolt (Stiebel 2003a, No. 5). The head was uniquely designed to be rectangular, by bending the two opposing parts of the originally circular perimeter (see: Vindonissa (Unz and Deschler-Erb 1997, 53-54, Nos. 2064-2087, Taf. 71).

Frogs were commonly ornamented, by plating, inlaying and *punctim* technique. A frog from Legio was gilded (V.3/G.3), a silver example was found at Samaria (I.6/G.1) and a tinned and a silver plated frogs were uncovered at Gamala (III.3/G.1-2).[8] The head of the former frog from Gamala was decorated by punched tendril designs. A compass-drawn rosette design ornaments the head of a frog from Legio (V.3/G.1). The three-petalled rosette constitutes the main motif, with each of the spaces in-between in turn being filled with a small four-petalled rosette. The perimeter is decorated with three running pairs of petal-like segments that link the large petal-tips.[9] The depressed ornamentation was punched, as attested by the outlines of the petals. It was originally filled with niello, most of which is now lost, due to an aggressive chemical and mechanical treatment that the object unfortunately under went, following its discovery. No direct parallels are known to the frog under discussion. The fact this design is so much at home in the east, may hint at local origin, though such a conclusion should be determined only by a future metallurgical test.

As noted above, Wild mentions bone items that are very similar in shape to metal frogs (Type X). This resemblance and the evident existence of bone military buckles (below), stand behind my notion of a set of Roman bone belt fittings. Surviving parts of the more robust examples used to have a metal pin that attached the head to the shank (Carroll and Fischer 1999, 564-565, No. 18.2). In Palestine, bone frogs are known from Masada (III.19/G.13-20), Jerusalem (III.12/G.2) and Gamala (III.3/G.3). Parallels outside Palestine are documented in Banasa (MA) (Boube-Piccot 1994, 91, No. 132, Pl. 13); Vindonissa (Unz and Deschler–Erb 1997, 55, Nos. 2107-2129, Taf. 71-72).

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[8] In the west dagger sheaths were inlayed with gold (Bishop and Coulston 1993, 192) and silver.
[9] The rosette is a common motif in Palestine; on Jewish ossuaries: Rahmani 1994, 39-41, section L, Figs. 72-85; bone artefacts, *etc.*

Buckles

The D-shaped buckle with the scrolled arms and the *fleur-de-lis* tongue is considered to be linked to the military (Grew and Griffiths 1991; Unz and Deschler-Erb 1997, Nos. 1138-1188, Taf. 43-44). Two such tongues are documented at Masada (III.19/G.3-4). Parallels are known from Kalkriese (DE) (Franzius 1995, Abb. 8: 6, 9), Kempten (DE) (Krämer 1957, Taf. B: 18), Verulamium (UK) (Frere 1984, Fig. 13: 96), Camerton (UK) (Jackson 1990, 32: 48-49, Pl. 5), Vindonissa (Unz and Deschler-Erb 1997, 37, Nos. 1186-1188). A possibly additional military buckle was found at Masada (III.19/G.2).

A lavish silver buckle from Masada (**Fig. 20: 4**) has no definite military traits. However, it is identical to a buckle from Vindonissa published as under the category of *militaria* (Unz and Deschler-Erb 1997, 53, No. 2056, Taf. 70).

Bone buckles seemingly formed an integral part of the military belt assemblage (Béal 1983, 255, 381, Pl. 44: 1341; Grew and Griffiths 1991; Unz and Deschler-Erb 1997, 37, Nos. 1192-1193, 1194-1209, Taf. 44).[10] Two fragments of buckles are reported from Caesarea (IL), one of which is dated from the first century AD (IV.1/G.1-2); an additional complete example is part of the Wolfe Family collection (VI.9/G.1). It is possible that bone buckles and frogs were used together as part of a set that was intended for special occasions.

Belt decorations

In addition to the mount, the belt (most commonly the baldric), was decorated by a variety of fittings some had symbolic functioning or perhaps even statutory indicators while others were merely decorative in nature. To the initial group we may assign the *beneficiarius* lance from Jerusalem (VI.3/S.1) that presumably adorned its bearer's belt (or clothes). Large circular *phalerae* further decorated the belt (Oldenstein 1976, 186-187, Nos. 686-694, Taf. 56); a gilded example is reported from Narbata (III.7/G.1).

(c) 'Apron' fittings

The 'apron' has been thoroughly discussed by Bishop and there is no point repeating this here (1992). A silver-plated stud from Masada (III.19/G.5) exhibits on its back the characteristic concentric rings (*ibid.*, 96, Figs. 14: 1-5). Additional silver-plated stud comes from the site of Legio (V.3/G.1). The diameters of both stud heads' fall within the suggested range for 'apron' studs: 14-18mm, though the latter lacks the two raised concentric rings underneath the head. Such studs were found in Rheingönheim (Ulbert 1969, Taf. 29, Nos. 27-

[10] *Cf.* Nos. 2012-2035, Taf. 70, p. 53.

31); undecorated examples: Vindonissa (Unz and Deschler-Erb 1997, Nos. 2207-2208, 2210-2214).

(iii) Shafted weapons

The archaeological evidence for shafted weapons in Palestine is somewhat meagre compared with other categories. This state of affairs, that is demonstrated even more drastically at Dura-Europos (James 2004, 188), may be elucidated by post-depositional processes, like corrosion, or by the gathering of the large metal heads and butts from battlefields for reuse and re-cycling (p. 251). Nonetheless, a synthesis of the historical, linguistic and archaeological evidence indicates that a large variety of shafted weapons was used in Palestine throughout the early Roman period. Moreover, some designs of complete shafted weapons appear embody data concerning their tactical use in battle. Such information may be further gleaned from the number of shafted weapons that equipped each soldier (Bishop and Coulston 1993, 96; below).

The Roman infantry forces that served and fought in Judaea during this period of time were equipped, similarly to their comrades in the west, with legionary *pila* and spears. The surprising new evidence for the use of *pila* in 4th century BC Palestine that is discussed below contributes to our knowledge of the type that has received scholarly attention in recent years (Connolly 1997; *apud* 2000; Horvat 1997). Early Roman Palestine witnessed the employment of both tanged and socketed *pila*, the latter type is known only from Second Revolt contexts. Strong oriental influence is found in the employment of the *contos* by the mounted Roman forces, the use of which was intensified towards the 3rd century AD (Goldsworthy 1996, 66; below). In addition to this heavy spear that was apt for tête-à-tête fighting, Roman horsemen have been further equipped with several light javelins which enabled skirmish fighting (*BJ* 3.96; Bishop and Coulston 1993, 69). Light javelins have been used by the Nabataean auxiliary, examples for which are known from Judaean Roman military sites (IV.6/H.1-2; IV.3/H.1; V.16/H.3; V.2/H.1-12). The provision of two shafted weapons is attested among republican and possible early imperial legionaries (Goldsworthy 1996, 199), and more clearly among early imperial auxiliary (Bishop and Coulston 1993, 69) and Nabataean infantry in our region (Taan 28_b; BB 74_a; Sanh 110_a). The added weapon provided Roman soldiers with spare ammunition, but also allowed a more versatile tactical operation in the battlefield of either launching two volleys of missiles (Goldsworthy 1996, 197-201) or saving the second missile for direct fighting. Shafted weapons were also employed in siege combat. A unique contribution of the arsenal from Palestine is a siege tool, clearly the *falx muralis*, that has been found at Gamala (III.3/O.1) and consists of a combined shafted spear and scythe-like feature (Stiebel 2005b, 102; below).

Of special interest are the local types, particularly in light of Price's assertion that '...in any case spears do not seem to have been used by Jews as regularly as swords, because of the

size of the weapon and the Jews' lack of experience with it' (1992, 236). This statement is clearly unfounded, in light of the historical and the diverse archaeological evidence that suggest that the local militia forces made ample use of shafted weapons. The rebels employed both hand-held and hand-thrown shafted weapons. Shock shafted weapons were intended for face to face fighting. At the conclusion of the siege of Jotapata, one centurion, Antonius, was killed on the spot, being surprisingly stabbed beneath the groin by a spear (*δορύ*) (*BJ* 3.335).[1] This category includes cast and forged solid iron shafted weapons, commonly with heavy and robust heads. Some of the designs are unique, clearly non-'Roman' or rather local in style, the most intriguing of which are the specimens from the 'Burnt House', Jerusalem (III.12/H.1) and the filed modification from the Figs Caves (V.19/H.1). Both were discovered *in situ* leaning against the walls of the discovery space, as they were left by their bearers. Examples for heavy spearheads that crowned long wooden shafts, as depicted in the Second Revolt site of Kh. as Salantah (**PL. V.32A: 2**), are attested in Second Revolt contexts (V.10/H.1; V.33/H.1). The unique head from Wadi el-Mrarzah (V.17/H.1), with its elongated dimensions and long shank, enabled to fight the Roman foes in an 'intermediate zone', after withstanding the volley of the *pila* and still beyond the reach of their swords (Stiebel 2004b, 127-128). The rebels have been equipped with spears that offered versatile employment, commonly exhibiting the widespread 'leaf-head' design with a prominent mid-rib (I.4/H.1; III.19/H.1). Hand-held missiles were in extensive use, examples for which were more frequent in Second Revolt contexts. Josephus mentioned ample use of shafted missiles by the rebels during the First Revolt. In this respect, it appears that the criticism of Price against the common translation of the words *διακοντίζομαι* and *κατακοντίζω* is argumentive in nature (1992, 236), whereas the circumstances in the narrated battles appear to support the interpretation of exchanging fire of javelins, clearly from the rebels' side as well.[2] The launching of shafted missiles from a distance intensified in the Second Revolt, the most notable example is the collard tanged light javelin, specimens of which have been found in five different refuge sites. Lastly, the numerous terms for shafted weapons found in the rabbinical sources further testify to their popularity among the local population (p. 210).[3]

Prior to the typological and chronological review, I found it useful to provide a general discussion of the chief three components that comprised shafted weapons: head (blade and socket/tang-shank), shaft and butt. The function of the shafted weapon seems to have dictated the shape and dimensions of its components. In general we may say that missile weapons tend

[1] The swift death was in all likelihood the result of an injury in the *aorta femur*, which is fatal.
[2] Price cast doubts that these terms indicate javelins. However, he does not explain the reasons for this claim and fails to offer an alternative interpretation.
[3] For the problematic Latin terminology: Bishop and Coulston 1993, 69.

to be lighter and shorter than thrusting weapons. They appear to have a smaller blade and at times they lack a butt. By contrast, thrusting weapons exhibit a long shank equipped with heavy blade and butt. Both types were employed by infantry and mounted forces.

(a) Constructional components

The head

Blades of shafted weapons occur in varied forms and sizes, which theoretically reflect their function. The head of the spear, lit. a point, is once noted in the *Babylonian Talmud* – שננה (*šananah*) (Sanh 82a; *Sifra Num* 131).[4] This term denotes a sharp object, yet it may also be interpreted as toothed item. Toothed blades are known with saws and sickles but possibly also for spearheads – Murabba'ât (**PL. V.16: 5**). The heads of shafted weapons tend to be less barbed, a common feature on arrowheads, presumably since it was important with thrusting weapons to allow the quick extraction for continuous fighting. However, toothed edges would have inflicted severe wounds without complicating the extracting of the weapon. Light throwing javelins were equipped with very sharp blades the penetration of which rendered the barbs unnecessary. The only possible exception is the barbed iron head from el-Jay Cave which features an anachronistic Hellenistic design (**PL. V.13A: 1**).

Designing a blade, the manufacturer aims to produce an object that is accustomed to suit best its main function: penetrating the target. Hence there is a marked difference between blades that were intended to penetrate armoured and non-armoured targets. The bodkin-like head, like that of the *pila* or the tip of the blade from Wadi el-Mrarzah (V.17/H.1) was designed to penetrate through shields and possibly armour as well. On the other hand, the narrow-bladed head with its sharp edges posed a dire threat to the victim's health, causing shock, haemorrhage and infection (Salazar 2000, 15ff). It was efficient even against armoured foes, capable of penetrating a cuirass at close range. A unique design that combined both traits can be seen on the spear blade from Wadi el-Mrarzah that exhibits an elongated low-shouldered blade that terminates in a bulbous tip. A rounded-tip design typifies the Arab light javelins, discussed below (IV.6/H.1-2; IV.3/H.1; V.16/H.3; V.2/H.1-12). The weight factor is evidently very relevant as light heads were required for throwing javelins, while the thrusting heads had a more robust construction to produce the effective impact. A further objective was to prevent the foe from reusing the missile during the battle. The long thin shank of the *pilum* bent at impact, and this is well attested in the archaeological record (**PL. II.2: 2**). Producing long and thin tangs, like that of the blade from the Cave of the Spear (**PL. V.17: 1-2**) allowed the stabbing of the enemy from a safe distance. It seems that less emphasis was given to the ill

[4] Rashi, Sanh 82a.

effects of crosswinds on javelins (*BJ* 4.76). Unlike with trilobate arrowheads, which were relatively less prone to drifting away from the target, all javelin blades are flat (*ibid.*, 4.76). Wind-planing was presumably less of a threat to the javelin, due to its larger dimensions and the reduced flight distance in comparison with the arrowhead. Some of the heads have a rather pronounced 'midrib' – asymmetrical in cross-section, which may be described as a corrugated blade (**Pls. V.16: 6-7, V.16A: 1-2**). This design would presumably result in a rotating flight which is steadier and thus seemingly more accurate. It may have also provided an improved penetration force.

Interestingly, paragraphs in the rabbinic literature suggest that, entering a religious institution, it was customary for the warrior to remove off the head of the spear and keep it in his *fascia* (Sanh 82a; *Sifra Num* 131).

The shaft

In the *Babylonian Talmud* we read about the 'wood of his javelin' (עץ חניתו) that evidently describes the shaft (Sot 42_b). The term מורניתא (*moranita*), that is used in the Aramaic translation of the Bible to describe a spear, seemingly derives from the type of wood it is made of – *murran* (cornel) (Krauss 1948, 213). Pliny mentions several types of wood that were favoured for the production of shafts in the Roman world, such as the cornel, Hazel, Ash and most preferably the Elder (Pliny *NH* 16.186-187 and 228), while Homer describes the mighty spear of Achilles as made of Ash that was felled on the peak of Mount Pelion (*Il.* 19.390-391; 20.273, 276; 22.133, 293; 5.666; 6:65). Ash (*Fraxinus* sp) and a coppice wood (alder (*Alnus* sp), hazel (*Corylus* sp), willow (*Salix* sp) or poplar (*Populus* sp) was used for the construction of spear shafts found in Corbridge (UK) (Allason-Jones and Bishop 1988, 13, nos. 26, 31, 38), while the employment of Hazel is reported from Newstead (Tagg in Curle 1911, 360, Table II). From the east, we learn about the use of palm-tree shafts (Speidel 1981). In Palestine, the socket of a spearhead from Murabba'ât still retained the unidentified wooden remains of its shaft (**PL. V.16: 5**). Yet, the only complete example of a wooden shaft in the Roman world was recently found at Nahal Qedem (**Pls. V.19A-19B**; Stiebel 2004b, 117-119). This fine example of 'field modification' is composed of a catapult bolt head that was replaced on top of a thin wooden pole – 882mm long. It may be compared with the possible fragmentary wooden shaft – 792mm+ – that is reported from Dura-Europos (James 2004, 190, No. 646). The distal end of the uniquely well-preserved shaft was shaped into a cone upon which the socketed head was fixed. Some oblique marks of the carving tool are still visible. The proximal end exhibits a smooth round finish. The near straight outlines of the shaft, and the near void signs of working apparently indicate deliberate coppicing (Bishop and Coulston 1993, 192).

In order to provide a better grip, the shaft of the spear was commonly bound by leather (Kel 15.5; p. 153), further evidence for which is found in representational sources (Pollitt 1972, Fig. 47). Light throwing shafted weapons were held by one hand, at times with the assistance of a leash that enhanced the distance of the throw. Thrusting shafted weapons, on the other hand, were carried by two hands, prior to the collision with the target. Modern experiments have demonstrated that the javelin shaft had a tendency to break at the head (Griffiths and Sim 1993, 5), as indicated by an example from Murabba'ât (V.16/H.2). Not only that the distal end of the shaft tapers to fit the socketed head, but in many cases it was further drilled to hold the rivet that secured the head. The latter feature has seemingly weakened the structure of the wooden shaft (Croom 2001, 132-133). The fact that the shaft of the improvised javelin from Nahal Qedem was not drilled, although the reused iron bolt head does retain a fastening hole, may be an attempt to avoid this deficiency.

Shaft treatment

Wooden shafts were seemingly smoothened, though as noted above, coppicing provided naturally apt shafts. The wooden tips of headless spears were hardened by fire (*praeūro*) (Tact. *Ann.* 2.14, 4.51; Livy 1.32.12). However, there are indications for further kinds of shaft's treatment. Although referred to by several scholars as a decoration (Stephenson 1999, 55), the coiling of the shaft presumably had also a functional importance. The sport helmet from Jerusalem (**Figs. 4-5**) features two charioteers wielding a spear and a trident with coiled shafts. Coiling is very much associated with representations of the Praetorian Guard. Several gravestones of these elite soldiers show the deceased gripping a *pilum* with a spherical element below the shank (a *pilum* weight), and a band or coil wrapped around the shaft (M. Aurelius Lucianus (3rd cent. AD) – Speidel 1993, Fig. 1; Anonymous Praetorian (2nd century AD) – *ibid.*, Fig. 2; L. Septimius Valerinus (3rd century AD) – Durry 1938, Pl. X: B). The same features appear on the equipment depicted on the Cancelleria Relief (Magi 1945, Figs. 23-25). Speidel refers to the coiled arm as a Praetorian *pilum* (1993, 141), and those traits may have indeed defined the *pila* of this unit from that of the ordinary citizen soldiers. The above examples, and in particular the realistic description of the Cancelleria Relief, clearly suggest actual stringing of the shafts rather than merely the applying of painted decorative bands (*contra* the reconstructions in Stephenson 1999, Pls. 7-10).[5] Such covering of the shaft would have provided the carrier with an enhanced grip. It appears further to have contributed to the strength of relatively thin wooden shafts of thrusting weapons, preventing these from

[5] The very late examples which Stephenson brings forward, *Notitia Dignitatum* (Not. Dig., Oc. 9.2) and the Ravenna mosaics (1999, 55), do not suffice to support his notion that the shaft was painted, as they may very well be an artistic representation of coiling. The discovery of a red painted spear shaft (?) is noted in a site card from Dura-Europos (James 2004, 190, No. 646).

splitting at impact in a similar way to arrowshafts binding.[6] Nonetheless, above all the coiling seems to have become a defining indicator of the Praetorians.

Shaft decoration

Wooden shafts were occasionally ornamented by incisions. Craftsmen have chosen to notch black timbers (Cornel) thus exposing the inner bright yellow xylem, creating an opulence image of contrasting colours (*NH* 16.186). Carved patterns decorate spear shafts from Danish bog deposit at Kragehul (DK) (Stephenson 1999, 55-56, Fig. 19).

The shaft from Nahal Qedem does exhibit some pressed lines that at first instance were thought to present decoration, but their inconstancy as well as being very shallow presses rather than proper incisions indicate that they were the result of accidental damage, whether the result of usage wear or of post-depositional processes (Stiebel 2004b, 117-119).

The butt

The butt or ferrule had several functions. Firstly, it balanced the weight of the head, thus ensuring a longer distance throw and presumably a steadier flight. The butt allowed the insertion of the pole in the ground, protecting the shaft in damp conditions. It also provided its carrier with a spare point, in case the head of the spear snapped. Polybius recognized this tactical advantage (*Hist.* 6.25).[7] The butt (*sgr*) is specifically noted in the War Scroll describing an elaborate decoration.[8] Very few examples were clearly identified as such in Palestine, most notably the examples from Masada (**PL. III.19T: 4-5**), two of elongated proportions. This deficiency could be accounted for by their resemblance in form to socketed bolt heads where the latter have been uncovered, which was not the case at Masada. However, this does not seem the to be case in Palestine, and based upon the current pool of evidence one may ascribe it to a local preference for shafted weapons without butts, as demonstrated by the javelin from the Figs Caves (V.19/H.1).

(b) Types of shafted weapons

As noted above, the finds from Palestine are of particular interest in light of the 'remarkably little evidence' for shafted weapons in the late Roman east sites, like Dura-

[6] Theoretically, the covering could have provided additional protection for the wood in damp conditions.

[7] *Cf.* Markle 1977, 336ff. *Sarissa* butt: Connolly 2000, 107-108.

[8] During the excavations of the Hellenistic levels of the Citadel in Jerusalem, several dozen short iron cone-like points were uncovered alongside typical copper-alloy arrowheads and *ballistae* balls. This find was interpreted as spear butts (Sivan and Solar 1994). Nonetheless, the notion must be rejected on two accounts: 1. If they were indeed spear butts, one would expect to find at least some spearheads. No spearheads whatsoever were uncovered! 2. Found together with the artillery ammunition, these iron points appear in facts to be bolt heads. Suggested to date from the siege of Antiochus VII (134-132BC), they are the earliest example yet uncovered in Palestine.

Europos (James 2004, 188). The abundance of typologies proposed by scholars indicates the difficulty in the establishment of exact distinguishing criterions and consequently in tracing the exact functions of the heads (Bishop and Coulston 1993, 69). Shafted weapons were described as 'notoriously difficult to classify' (*ibid.*). Part of the problem lies in the organic components, like the shaft, that normally do not survive. Thus, the typology that concentrates upon the head's size and shape tends to be somewhat hypothetical rather than representative, dealing with merely a part of the complete arm. It seems that shafted weapons may be divided into two principal categories: missile and thrusting weapons or hand-thrown and hand-held shafted weapons respectively. It is important to note that this classification is artificial and represents the two extremes of the arm's function, as: 'even the slenderest of javelins might be used as a thrusting spear and the longest spear as a missile' (*ibid.*). Compared with hand-hold shafted weapons, hand-thrown weapons seem to exhibit smaller dimensions and lighter weight. An additional distinguishing trait appears to be the methods used for fastening the head to the shaft. The archaeological record from Palestine appears to suggest that tanged heads were far more popular with light thrown javelins, whereas socketed heads appear more commonly with hand-held thrusting spears. Using a tanged head is more economical, from the material point of view, but more significantly it is weight saving. Providing a light head was essential to ensure a long distance flight, and consequently little of a balancing element was required at the shafts' bottom, if at all. In this case, fastening the head to the shaft was very simple and a tightening tendon sufficed, while the socketed head commonly required the addition of a metal nail that secured the head to the shaft.

This general dual scheme, however, has its exceptions. Shafted weapons which share traits of both categories, constitute in the Roman period a distinct group of heavy throwing weapons. The Romans operated the *pilum* in medium ranges, hurling it to a distance of 20-30m. Tests with replicas of Republican *pila* demonstrated an effective range of 25m (Connolly 2000). In Palestine, an additional type with traits of both categories was in use during the Second Revolt. The unique local type has a long thin metal shank that terminates with a narrow-bladed head. Clearly apt for stabbing, the long shank enabled engagement from a relatively safe distance, which drew away from the reach of the foes' edged arms (V.17/H.1; Stiebel 2004b, 127-128).

Typologically, the shafted weapons from Palestine appears to cluster around eight major categories (some may overlap), in accordance with their outlines, size and (tactical) function: Light throwing javelins; throwing and thrusting javelins/spears; spears; *pila*; heavy spears; wooden-tipped shafted missiles; shafted siege equipment; ceremonial spears.

Light javelins

Light javelins have been carried by both Roman mounted and foot soldiers.[9] This specialised weapon also equipped the local militias. The employment of light projectiles throughout the classical period in our region is attested in the ancient historical sources. In the War Scroll the author notes the *zrq* (זרק), a light javelin (dart) that equipped three of the skirmishing units (1QM VI, 1-4) and light cavalry (1QM VI, 15) of the Sons of Light army (Yadin 1962, 131-133; below). The term *shelet* (1QM VI, 2) is mentioned in the Scroll presumably as a synonym to the *zrq* (*ibid.*, 133-134). It appears that seven such javelins armed these foot soldiers.[10] Yadin associated this weapon with the *hasta velitaris* (*ibid.*, 133), citing Livy as referring to a case in which seven such missiles equipped the *veles* (prior to Marius's reform). The Herodian army was composed of light-armed troops that included javelin-throwers (Shatzman 1991, 162, 210). The soldiers that were lowered in a chest-like device to fight the Galilean rebels in the Arbela used javelins (*παλτᾶ*) in addition to swords (*AJ* 14.425-6). Herod himself suffered a wound in his flank being hit by a javelin (*παλτόν*) thrown by Antigonus's soldiers (*ibid.*, 456; *BJ* 1.332).

The commonest light javelin head in Palestine was the collared tanged type, featuring an elongated thin blade. The four Judaean Desert examples and one specimen from the Shpheala indicate that this type equipped the local rebel forces during the Second Revolt and appears to be a *fossile directeur* of that period of time. The local population kept the use of Biblical terminology, referring to the javelin as חנית (*hanit*)[11], in addition many references have been made to חץ (*hetz*) and one reference to שבט (*shevet*) (Sot 1.8).

Describing the equipment of the Roman cavalry of the mid 1st century AD, Josephus mentions a quiver that slung from the horse's side, in which 'three or more darts (*ἄκοντες*) with broad points (*πλατεῖς μεν αἰχμάς*) and as long as spears (*δοράτων*)' (*BJ* 3.96). The term *ἄκοντες* is noted only three times in Josephus's account; when referring to the First Revolt it applies to the Roman shafted weapons alone. The broad point of the *ἄκων* is interesting, for by and large the blade was more long than wide. One may cautiously associate this description with the very unusual broad iron head found in Wadi Murabba'ât (**PL. V.16A: 1-2**). The Romans had a light javelin (*iaculum*), the length of which is estimated at 1.17m (Yadin 1962, 133). The length of the complete improvised javelin from the Figs Caves accords well with this measure (V.19/H.1). Of special interest are the light javelin examples found in the South and East arid sectors of the province. This type is tanged and features a

[9] The latter is applicable to the early Republican army alone.
[10] Possibly a formulaic number (Shatzman 1996, 111).
[11] A somewhat confusing idiom appears in *Sifra Num* 131: חנית של רמח (a javelin of a *romach*); unless the word רמח refers to the javelin-thrower.

prominent midrib with a rounded tip. Parallels with rounded tips, though socketed and lacking a midrib, are attested in Vindonissa (Unz and Deschler-Erb 1996, No. 280, 282, Taf. 18). In Palestine, two examples have been found in 'Ein-Rachel, a Roman fortress that according to the cultural material unearthed there was manned by Nabataean soldiers (IV.6/H.1-2). The same ethnic linkage appears to be applicable for the example from Kurnub (IV.3/H.1). It is therefore tempting to deduce the presence of auxiliary Arab soldiers, in the Murabba'ât caves, and in the camp at Tel Shalem where more specimens of this type have been found (V.16/H.3; V.2/H.1-12). These *c.* 70mm long heads are perfectly apt to equip light javelin heads. Yadin further provided a linguistic parallel between the *zrq* of the War Scroll and the Arab marital arsenal (Yadin 1962, 132-133, note 4). The latter includes a *mizraq*, which is a javelin of the pre-Islamic Arabs, about 3-4 cubits long (Schwarzlose 1886, 243). The Arabs had further terms noting short lances (or javelins): *mizrāq*, *mizraqah* (Yadin 1962, 133, note 5).

Indeed, the local terminology of light javelins indicates a clear linguistic diffusion of Latin, Greek and Arabic into Hebrew, which seemingly reflect the types of javelins that have been in use in Palestine. We learn about the employment of the בורטיא (*burtia*) (Shab 146a; 27b), a word that derives from the Latin *verutum* (verrūtum) and Greek *βηρύττα* (*Lehn.* II, 145, and *TA* II, 310). This weapon has been evidently in Roman military use (*BG* 5.44.7, 11; Livy 1.43.6, 2.20.8; 8.24.13; 10.29.6; Verg. *Gerog.*, 2.168). The word לונכי (*lonci*) is commonly used, with variations such as: לונכא, לולניאות, לולכיאות (*Lehn.* II, 311). It clearly derives from the Greek *λόγχη* and the Latin *lancea*. The body of R. Yehuda son of Baba was pierced by 300 (sic!) Roman iron *lolnieot* (AZ 8_b). The Persian *lonci* was famous for its effective blow. Being smeared by poison it hastened death (Git 70_a).

Versatile javelins/spears

Spears were commonly used in versatile ways, apt both for hurling and thrusting. The early imperial Roman auxiliary forces are often described carrying two spears (Bishop and Coulston 1993, 69), while the Jewish rebels used the *kidon*. Several heads from the First and Second Revolt appear to fall under this general category. A socketed leaf shape head with a prominent midrib from Masada (III.19/H.2), which was discovered alongside its butt, may be paralleled with a head from the Second Revolt at Khirbet-el 'Aqd' (V.9/H.2) and with examples from Hod Hill (UK) (Manning 1985, 168, V135) and Vindonissa (Unz and Deschler-Erb 1997, No. 249). An additional corroded leaf shape head was uncovered at Masada (III.19/H.1).

Shafted weapons were further used for hunting.[12] The *Midrash* notes the launching of *asparisa* (אספריסא) (*Lam R* 3.4), which clearly stems from the Latin *sparus* = a hunting spear (*Lehn.* II, 94).

Spears

This category may be described as a thrusting shafted weapon that has been employed by rebels. Two large spearheads that were found in the Judaean Desert were clearly intended for face-to-face battle. Both share a large narrow blade which was highly apt for stabbing. One example is socketed (V.16/H.2), while the other, presumably of local production, crowns a long shank (V.17/H.1). Parallels to this elongated blade are known for example from Hod Hill (UK) (Manning 1985, Nos. V111-116, Pl. 79), Vindonissa (Unz and Deschler-Erb 1996, Nos. 285-287). Both weapons were seemingly used for thrusting rather than hurling.

In addition to biblical term, noted above: *kidon*, the Rabbinical Hebrew further mentions the מטרניא (*matania*) – or מטרסאות (*matrasa'ot*) (*Sifra Deut* § 204), which seemingly derived from *ματερία*, and has been interpreted as a 'Bauholz' (*Lehn.* II, 333). Jastrow referred to it as *tormenta*, the siege machinery (1926, 527_a). However, in light of the evident martial lexical context I suggest to link its interpretation with the word *myrtus* (or *murtus*), which is taken to mean 'a spear of myrtle-tree' (Verg. *Aen.* 7.817; see *LJS*). Additional possible elucidation may stem from the Latin word *matara* that designates a spear, a Celtic spear *matara* (= *μάδαρις*) (Strabo Geog. 4.4.3). In Latin one also finds the forms *materis* and *mataris* (*BG* 1.26.3).

Pila

The specialised hurling shafted arm that is associated with Roman legionaries was the *pilum* (Bishop and Coulston 1993, 48-50, 65-66, Feugère 1993, 100-102, 166-169; Goldsworthy 1996, 197-201; 229-230). This convention, however, was seemingly not all embracing, as *pila* were employed by some auxiliaries as well (Ulbert 1968, 12-13). The weapon was also in the possession of the Praetorian guard, distinguished with its circular weight (Bishop and Coulston 1993, 65, 123). In Palestine, at least two heads were unearthed in the Hellenistic period, while five heads and two collets are documented in Roman Palestine. The *pilum* has suffered from two distinct errors of classifications; on one hand, *pila* heads have been identified as arrowheads (Khamis 1996, 219), on the other hand, artefacts like drill bits, arrowheads or *catapult* bolts have been erroneously published as *pila* heads (Magness 1992, 63; Yadin 1965, 96; Ilan and Damati 1987, 38; for the west – Bishop and Coulston 1993, 65).

[12] Diet: Davies 1989, 191-193.

The earliest appearance of a *pilum* head in Israel is from the mid 4th century BC site of Nahal Tut (**Fig. 22**). The one strata site was dated to the campaigns of Alexander the Great in Palestine (332-331BC). The 200mm long socketed object has a flat barbed head, the tip of which is slightly bent due to impact. Both its dimensions and outlines associate the head with the early socketed *pila*, a type which was linked with the *hasta velitaris* (Connolly 1997, 44, Figs. 1, 4; Connolly 2000, 43, Fig. 1.6). Well-dated parallels are known from the 4th century at Pomarcio Vecchio (IT) (*c.* 300BC). Four examples of mid 3rd century date are reported from Montefortino (IT) (Connolly 1997, Fig. 1 B-E). At least 47 examples are known from the hillfort near Šmihel (SI) (Horvat 1997, 111, Fig. 6), and further from Numantia and Renieblas III (ES) (Connolly 1997, Fig. 1: F-J). The head from Nahal Tut differs from the latter group, featuring a flat barbed blade which is more akin to that of the Talamonaccio type.

An iron tool recently published from Timnah (Tel-Batash), Israel (Map ref.: 141.132), provides further information regarding the early *pila*-like head (**Figs. 21: 3-4**). The object was found in Area H, in a courtyard of a structure from Stratum II (Mazar and Panitz-Cohen 2001, 216, No. 39, Photo 150 and Pl. 95: 15[13]; Mazar 1997, 160-161, P/S 65). It is composed of an iron shank and a very distinctive flat riveted tang, the proximal part of which terminates with a triangular recession. Remains of the wooden shaft are visible on both of the tang's faces. The length of the rivets – 3cm – indicates the thickness of the wooden shaft. The common use of a pair of iron rivets in the attachment of the *pilum* head is noted by Plutarch (*Vit. Mar.* 25.1-2).[14] The elongated circular-sectioned iron shank is bent, broken in two, and missing its tip. A 'pointed rod' found in the same locus (**Fig. 21: 4 – right (No. 15)**) could have very well served as the tip of this weapons, although this notion is not conclusive (Mazar and Panitz-Cohen 2001, 216, No. 40, and Pl. 95: 16).[15] One is further tempted to associate the bending of the head with the celebrated description, of the intentional bending of the Roman *pilum* head following impact due to the hafting method of the metal head to the wooden shaft (Caesar, *BG* 1.25.3; Although see: Connolly 2000, 46).

The flat riveted tang of the head from Timnah can bee directly related to an example from Šmihel, which seemingly originated in an early 2nd BC context (Horvat 1997, Figs. 3-5 – type 1). The original date of the Timnah find poses us with a difficulty, for the excavators assigned it to Stratum II, which is dated to the 7th century BC (Iron Age II). If our identification of the object is correct this assignment seems unlikely. An examination of the final report indicated

[13] Erroneously marked as no. 14.
[14] *Cf.* Polybius *Hist.* 6.23.9-11.
[15] Erroneously appears under no. 15. Simple sharpened heads: Talamonaccio (IT), Šmihel (SI), Numantia (ES) and Alesia (FR) (*cf.* Connolly 1997, Figs. 1, 4).

that Area H was strewn with many late pits, dating to the Persian period (Stratum I). Indeed, a large stone-lined pit (Locus 1020) cuts Locus 1007, to which the *pilum* head was originally assigned (Mazar 1997, 164, P/S 66). Whether it was an intrusive find or originally part of the material from the pit, I would like to suggest assigning this *pilum* head to the Persian layer of Tel Timnah, which dates to the 5th-4th centuries BC. In light of the parallels from the west, the head under discussion should be placed in the later chronological frame of strata I, i.e. the 4th century BC.

Interestingly, both the socketed and tanged forms appear in this early chronological stage. In light of the present finds and their Eastern discovery location it is important to consider the distribution mechanism of the *pilum*. First, let us examine the question of origin. As noted above, the earliest example derives from 5th century BC Italy. The following century witnessed a growing number of such heads in north Italy, seemingly indicating a Celtic association (Connolly 1997, 44, Horvat 1997, 111). The closely dated head from Nahal Tut is ascribed to the campaigns of Alexander the Great in Palestine, indicating that in his army there were javelin throwers equipped with *pila*, the ethnicity of which is sought by us. It seems that one may illustrate two theoretical lines of arguments that may be accounted for the discovery of the head at Nahal Tut: the direct and indirect relation. The fact that the major find spots as well as the prolonged tradition of its use radiate from Italy designates this region as the cradle of the *pilum*. However, to the best of my knowledge no direct evidence exists to the recruitment of mercenaries of Italian origin in the Macedonian army. Therefore, dismissing the direct Italian-Macedonian relation, one should seek for an intermediary agent through which the design of the arm has reached Alexander's army. If we accept the Celtic relation, namely the employment of *pila* during the 4th century BC in North Italy, as exemplified in sites such as Montefortino, we appear to provide a bridge for the transferral of this type towards the east. The historical sources indicate that Alexander enlisted mercenaries, and more specifically javelin-throwers, from the lines of the neighbouring tribes, like the Paeonians, Agrianes and Illyrians (Parke 1933, 186ff; Griffith 1935, 12ff and 235ff), part of which bordered with the inhabitants of northern Italy and Celtic societies. Thus, it appears that the Balkan mercenaries may be hold responsible for the presence of the *pilum* head at Nahal Tut. The above seems to illustrate the spreading of Italian designs prior to the direct military contact between the Romans and the Greeks in the 3rd century AD that produced a strong reciprocal influence, which intensified towards the mid-2nd century BC, resulting in the reform of the panoply of the Greek hoplite in 160's BC.

A well-defined *pilum* head is reported from a Hellenistic context in Samaria (I.6/H.1). Turning to the Roman period, five *pila* heads and two collets were uncovered in Israel. Two collets were found at Gamala (III.3/H.1-2), while a head of seemingly the early Roman Period

was found in a later fill at Yoqne'am (II.2/H.1). Another tanged head was found at Samaria (I.6/H.2). A possible piece of historical evidence for the use of the *pilum* in Palestine during the fourth decade of the 1st century AD is embedded in the narration of Jesus crucifixion. It is there mentioned that vinegar was submitted by either a soldier or one of the spectators to Jesus. According to John, the vinegar was applied on a sponge which was placed upon *ὕσσωπος* – hyssop/moss. Yet, there are scholars who read there instead: *ὑσσός* = *pilum* (Krauss 1948, 213). Lundgreen identifies the shafted weapon, used by the Roman soldier to stab the dying Jesus, with the *pilum* (*ibid.*, 213, note 7). If this interpretation is true one may argue that *auxiliaries* were equipped with *pila* for in Judaea at that time the Roman force was composed of auxiliary units alone. During the First Revolt, Josephus mentions that the Roman legionaries were equipped with the *ξυστόν* (*BJ* 3.95), clearly the *pilum*. The prominence of the metal points of the *pila* appears to be embedded in his description of the Jewish rebels being *νυσσω* by the *ξυστόν* during a failing attack at Jerusalem (*ibid.*, 6.22).[16] Three heads are directly associated with the Second Revolt; tanged heads from Wadi Murabba'ât (V.16/H.1) and Khirbet-el 'Aqd' (V.9/H.1), as well as a socketed head from Bethther (V.6/H.1). The *pilum* from Yoqne'am exhibits the characteristic feature of bent shank as a result of impact, as well as a bent tip (Bishop and Coulston 1993, 48, 50, 65-66). In Palestine, no *pila* heads are reported from contexts that are later than the 4th decade of the 2nd century AD. The type appears to go out of use in the third century AD, if not during the late 2nd century and it is not represented in Dura-Europos (James 2004, 188). No direct reference is made to the *pilum* in the ancient Jewish sources, presumably reflecting the fact that it went out of use in the late 2nd century – Early 3rd century AD.

It is rather striking to learn how relatively fewer *pila* heads were recovered in the battlefields of Palestine, in comparison, for example, to iron arrowheads. One may theoretically claim that in the battle sites represented in the study, mainly sieges, the weapons had a less significant tactical function therefore it was not in common usage on the walls. Another possible explanation is that the heads of shafted weapons were not present in the excavated *loci*. In this case, the preservation conditions may not be held responsible for the heads absence as other types of iron missiles (arrowheads and catapult bolts) were there found. Thus, one must assume that it is due to sheer coincidence that few shafted heads were deposited in the excavated areas; a difficult argument in light of the fact that a large part of the wall and the adjacent areas (on both sides) were excavated. It seems to me more likely that the large dimensions of the *pilum* made it easy to be gathered after the end of the battle,

[16] The same term was only once used to denote the spears that were used by the Jews to slay the stumbling centurion Julianus (*ibid.*, 6.86), being an example to Josephus's careless use of terminology?

hence generating the scanty representation in the archaeological record (arrows gathering – pp. 251, 265).

Heavy spear

The heavy solid shafted weapon has been solely intended for thrusting (shock arm), equipping both mounted and foot forces. The War Scroll notes the *romach* as the weapon of the front formation (1QM, V, 6-10), the heavy cavalry (*ibid.*, VI, 14), and the soldiers of the 'towers' (*ibid.*, IX, 12). The commentators have debated over the identity of the spear, indicating that it does not concur either with the spears employed in the Hellenistic armies or by the Romans (Yadin 1962, 135-139; Shatzman 1996, 111-113). However, the detailed description of the weapon, most particularly the part that is linked with the term *sgr*, leaves in my eyes no doubt that it reflects strong Hellenistic affinities, identifying it with the *sarissa*.

Josephus uses the term *contos* describing the shafted weapon of the Roman cavalrymen (*BJ* 3.95).[17] In the east this term was used to designate the formidable arm of the Parthians (Goldsworthy 1996, 66). An *Ala I Ulpia Contariorum milliaria* that served in Upper Pannonia (Spaul 1994, 97-100), is attested in the 3rd century AD at Apamea, Syria (*AE* 1987; Bishop and Coulston 1993, 109, 111). According to Syme the Latin *contus* differed from the Greek and the κοντός, in that the former was carried by two hands and was used for thrusting alone, while the latter could have been also hurled, citing Josephus (*BJ* 3.95) and Tacitus (*Hist.* 3.27) as evidence (Spaul 1994, 98). It is not clear whether the inhabitants of Palestine were aware of these subtleties.

In Roman Palestine, the earliest archaeological evidence for a solid spear was found in the 'Burnt House', Jerusalem (III.12/H.1). Discovered in a destruction layer dating to the 8th of Elul, AD70, the spear was leaning on one of the corners of the basement of the priestly house. The local weapon was a shock weapon intended for fighting in close range. This type was still in use during the Second Revolt, found in the entrance to the hiding complex in the site of 'Bypass Shoham' (V.10/H.1). The latter head was cast as its flat asymmetrical cross-section testifies. Additional specimen is reported from 'Nahal Yattir Site' (V.33/H.1), while a graffiti of a warrior equipped by such a spear was found in the nearby Kh. as Salantah (**PL. V.32A:** 2). The improvised javelin from Nahal Qedem was clearly following the same design approach, apparently intended to be utilized in a close range fight (**PL. V.19A: 1**). The regional popularity of this type is further exemplified by the arsenal of the Arabs. The Arabian warrior is described armed with the *romach* – the long heavy spear (Taan 28_b; BB

[17] The term קונדוס (*kondos*) was interchangeably used with the term קונטוס (*kontos*); both seem to originate from the Greek κοντός, suggesting that both the meanings of a heavy spear and simply a wooden stick were applicable (*Lehn.* II, 512-513).

74_a; Sanh 110_a). These references correspond to the depictions of Arab foot soldiers carrying two shafted weapons and cavalrymen equipped with a long spear (p. 222).

Wooden-tipped missiles

A discovery of possible short wooden-tipped shafted weapons was made in Cave 5, Nahal Mishmar (**PL. V.27: 3**). Their crude outlines clearly suggest that the missiles have been produced locally, for militiamen use. Such short javelins are attested in Latin sources (Tact. *Ann.* 2.14), which describe the hardening of the tip by fire (*praeūro*) (*ibid.* 4.51; Livy 1.32.12). Wooden-tipped javelins have been used in the training of the Roman cavalry (Arrian *Tact.* 34.8, 40.1).[18]

Shafted siege equipment

A unique shafted siege tool was found in the excavations of the Roman breach at Gamala. It is composed of a combined sickle and leaf-shaped spearhead, very apt for stabbing, slashing and hooking (Stiebel 2005b, 102; **PL. III.3AM**). Josephus describes the use of an identical tool (*falx muralis*) during the siege of Jotapata: '...the Roman invented a counter-device of long poles to the ends of which were attached scythes, with which they cut the cords supporting the sacks' (*BJ* 3.225). It seems, however, that this was not a new innovation as such devices have been in a regular use. The *vigilis* operated both the *uncinus* and the *falx* (Reynolds 1926, 89-90), while military employment is attested in Gallia: 'One thing provided by our men was of great service, [viz.] sharp hooks inserted into and fastened upon poles, of a form not unlike the hooks used in attacking town walls' (*BG* 3.14.5).[19] The overall shape bears remarkable resemblance to the '*falces*' used to date by the fire-brigades.[20] I reject the suggestion to regard the socketed iron implement from Dura-Europos as a *falx muralis* (James 2004, 188, No. 643, Fig. 114). The position and upturned orientation of the 'sickle' element negates this identification (nor allows its identification as a 'boat-hook'). It appears to be a spear-butt with a tread, as indeed suggested there (*ibid.*; *cf.* Fig. 24: G).

Ceremonial spears

During the ceremonial awarding of *dona militaria* in Jerusalem, Roman soldiers were presented with 'little (*μικρά*) golden spears' (*BJ* 7.14). Curiously, a miniature spear-badge of a *beneficarius* was found in the Upper-City, Jerusalem (**PL. VI.3: 3-4**). However, Niese have noted that in most manuscripts one rather reads: *δόρατα μακρά χρυσᾶ* – i.e., long golden

[18] Wooden-tipped arrows at Dura-Europos: James 2004, 196.
[19] *Cf. BG* 7.22.2.
[20] The use of hooks and spears, which is equivalent to the operation of the combined tool from Gamala, is noted in the battle at the refuge caves of the Arbela (*AJ* 14.426). *Cf.* Strasbourg (FR): Forrer 1927, 514, Nos. 11084, 11243, 11247, 11061, 11442.

spears. If indeed so, Josephus' account may in fact refer to the *hasta pura*; a Roman military award that was 'more or less life-sized replica of a weapon' (Maxfield 1981, 86; Polyb. 6.39.3-4).

(iv) Clubs, sticks, staves and maces

The use of club-like weapons in the lines of the Roman army may be divided in two: functionally and ceremonially. The evidence for combat use of wooden clubs by the Romans is rather scant, strictly confined to the *auxilia*. Perhaps the most celebrated example is depicted on Trajan's Column (scene LXX). The mason included, aside to the *saggitari* and *funditores*, a group of semi-naked combatants armed with clubs. These are presumably German soldiers (Coulston 1988c, 297), and they are further found in scenes XXIV and XXXVIII (*ibid.*, 296).[1] Nonetheless, it appears that in the Near East such weapons were rather common, the roots of which lie back in the 4th millennium BC! Clubs were used to enforce discipline, among the military society as well as against the local population, forming concurrently a status symbol (see below). The symbolic function of the club stems from the Herculean tradition (Alföldi 1949), while often clubs and maces were employed ritually, during sacrificial processions (below).[2]

An examination of the evidence from the east, and more specifically from Palestine, clearly indicates that the employment of this category of equipment was very common, both in the lines of the Roman army and amongst local peoples. The simple wooden-staff was used by shepherds and pedestrians throughout the history of the country (1 Sam 17.40). Ancient historians commonly used this weapon in their narrations, in order to describe the paucity of the arsenals they were discussing. The ill-equipped Jews in the beginning of the First Revolt are depicted as armed with: *λίθοις καὶ ξύλοις* (stones and sticks) (*BJ* 2.526).[3] Nonetheless, the description of swords and clubs appears as a typical literary motif in describing the Jewish weapons (*NT* Mt. 26.47, 55; Mk. 14.43, 48; Lk. 22.52). Wooden staffs were employed during the internal clashes in AD70 Jerusalem (*ibid.*, 5.100-103). The popularity of the club in the panoply in Palestine is further noted in the *Mishnah*: '...the club and the bow and the spear' (Kel 16.8). An anecdotal testimony illustrates the use of the club in the clashes between the various social strata in Roman Palestine. The remonstration against the arbitrariness of the priestly families, and the social and economic differences between the priestly families and the common people, is straightforwardly manifested in a chant:

> 'Woe is me because of the House of Boethus,
> Woe is me because of their clubs...
> Woe is me because of the House of Ismael, son of Piabi,
> Woe is me because of their fists.

[1] Their knobbed club may reflect a Herculean stylistic influence.
[2] An attribute of the Caesars (Meshorer 1989, 22, No. 6).
[3] *Cf. BJ* 1.550.

> For they are High Priests and their sons are treasurers,
> and their servants beat the people with staves' (T Men 13.21; Pes 57_a).[4]

In the Temple, wooden staffs were used for punishing the sinning priests (Tam 28_a). Found sleeping while on duty, the guards of the temple were disciplined with severe punishment (*ibid.* 24_a; *cf. fustuarium*). In a very like manner, the club was employed by the Romans to enforced order, within the lines of the soldiers. Josephus notes the order of Titus to one Liberalius, 'a centurion of his bodyguard..., to restrain, by resort to clubs (ξύλοις), any who disobeyed orders', during the rage of battle in Jerusalem (*BJ* 6.261-263). In the province, this order-enforcing tool was too often misused. A common hazard for the local population in Palestine was the chance of meeting a Roman soldier in the road, for which a code of behaviour was issued:

> "[when] an Israelite goes along with a gentile [i.e. a soldier], he puts him, at his right hand [, and he does not put him at his left hand]. R. Ishmael son of R. Yosé [b. Beroqah] says, "[If the gentile] has a sword he puts him, at his right hand, [If the gentile] has a staff he puts him, at his left hand." [If] there are two going up on an ascend or going down a ramp, the Israelite goes up ahead, and the gentile behind. And [going down] he may not bow before him, lest he knock his head. And he should leave a good distance for him...' (PT AZ 2.1 9_b).[5]

The popularity of the club in the fields of conflicts of the Roman east lasted into the Late Roman period. In AD 272, Aurelian's army faced a 70,000-strong Palmyrene force, headed by Zenobia and her general Zabdas, in a plain near Emesa (SY). Soldiers of many origins comprised the Roman force. Amongst the contingents from Asia, that are praised for their bravery, a Palestinian force is noted. Unlike the rest of the soldiers, Zosimus dedicated a reference to the Palestinian weaponry, clearly a literary hint about the upcoming events: 'the Palestinians besides other arms wielding clubs and staves' (Zos. 1). Though inferior in number, the Roman force:

> 'observing that the Palmyrenes had broken their ranks when the horse commenced their pursuit, they wheeled about, and attacked them while they were scattered and out of order. Upon which many were killed, because the one side fought with the usual weapons, while those of Palestine brought clubs and staves against coats of mail made of iron and brass. The Palmyrenes therefore ran away with the utmost precipitation, and in their flight trod each other to pieces, as if the

[4] *AJ* 20.181, 206-207.
[5] Neusner with my modifications. *Cf.* T AZ 3.1.

> enemy did not make sufficient slaughter; the field was filled with dead men and horses, whilst the few that could escape took refuge in the city' (*ibid.*).

The success of the Palestinian soldiers to blow down the Palmyrian cavalry, which rather reminds the White Knight in 'Alice through the Looking Glass', may be ascribed to the lack of stirrups (Adcock 1940, 25). Straight staves were employed by cavalrymen as well, as noted by Arrian (*Tact.*, 43.2; Hyland 1993, 154-155, 157). Interestingly, two representations of horsemen are carved on the walls of Hall 11 in Catacomb I at the necropolis of Beit She'arim (3rd-4th centuries AD) (Mazar 1957, 78-80, Pls. XIV: 2 and XV: 2). The horsemen, dressed in military fashion, appear both to be armed with a club (**Fig. 23: 1-2**), although theoretically these might have been crude representations of swords. According to Virgil, oak was used to produce clubs and the wood was apparently hardened by fire (Virg. *Aen.*, 7.524).

Several terms in the rabbinical literature designate club and staves. In addition to the biblical term – *alah* (אלה), one also finds the *maqel* (מקל) – wooden stave. The use of the terms *gzir* (גזיר), *qurnass* (קורנס) *zmorah* (זמורה) and *agmon* (אגמון) prevailed. To this items one can add the *manpesh* (מנפש) (T Kel BM 3.1) that equals the *manpets* (מנפץ)[6] = *manpes* (מנפס)[7] = *manpet* (מנפט)[8], which was made up from two joined wooden sticks. It was used to beat the flax and listed in the *Tosefta* among other weapons.[9] Such a tool – *τὸ ξύλον* – was used in the martyrdom of James (Eusebius *Kirch.* 2.23.11; below). The *Babylonian Talmud* notes the *kulpha* (קולפא) as a synonym for club (Shab 63_a), reflecting Persian influence.[10]

(a) Constructional components

Grip

Further information regarding the construction of the club is found in the *Mishnah*:

> 'The cover (חיפוי – *hipooi*) of a club, a bow or (lit. and) a spear – these are pure. This is the rule: That which is designed as a sheath (or case) is impure; as a cover is pure' (Kel 16.8).

These laws are taken from a section that is dedicated to leather utensils (*ibid.*, 16.4-8). It is thus clear that the coverings mentioned above were made from hides. However, the commentators did not offer an explanation as to the exact nature of these coverings. The Hebrew noun – חיפוי (*hipooi*) means: covering, overlaying and coating (Jastrow 1926, 490).

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[6] *BY* 3731-3732.
[7] *Ibid.*, 3731.
[8] *Ibid.*, 3720.
[9] The Hebrew verbs נפץ and נפס derive from the Assyrian *napasu* which designates the verb 'to beat'.
[10] The term derives from the ancient Persian word *kopal* – a wooden rod with a bulbous head. The Geonim describe the *kolpha* as a rod with bulged head from which spikes or projections jut out (*Gen R* 98).

Two theoretical elucidations, which are common to all three weapons, may be offered: the coating of the entire weapon or of part of it. As it is clear that the entire covering of these weapons did not exist, the only possible common use of leather binding is that of the grip. Defined by parallel oblique lines, which resemble straps of leather binding, a club's grip is discernible on a Macedonian coin from the mid-2nd century BC (Anson 1911, Vol. II, 559, Pl. X). The grip of a Herculean club is depicted with crisscrossing straps (Simon 1990, Fig. 101). For the spear's grip: p. 136.

Hanging loop

Like in modern security forces, the baton in the classical armies had one extremity terminating in a leash. This element, presumably made of leather, provided a better grip for its carrier by securing the baton to his hand. Hence, during vigorous beating, the leash that was worn on the hand prevented the club from flying out of control. A detailed description of a hanging club is sculpted in an Etruscan tomb (late 4th century – early 3rd century BC) (**Fig. 23: 3**). The thong, seemingly passing through a hole that was pierced at the proximal end of the club, has an additional use, allowing the club to be suspended. A group of arms is portrayed on a clay sarcophagus from North Italy, among which a club with an eight-figure leash is discernable (**Fig. 23: 4**). A further artistic representation of club hanging loop is carved on a stone sarcophagus from Konya (TR) (Akurgal 1987, Abb. 249, bottom (second from right)). The existence of such an element on the clubs of Roman military officials in Palestine is explicitly mentioned:

> 'All hanging loops are impure, except for the hanging loop of a sieve or (lit. and) the riddle of the householder; so R. Meir. But the Sages say: They are all pure, except for the hanging loop of a millers' sieve, and the hanging loop of sickle, and the hanging loop of a *balashin*, because they assist at the time of work. This is the rule: That which is designed to assist at the time of work is impure; that which is designed as a hanging loop [alone] is pure' (Kel 15.4).

The identification of the *balashin* is somewhat obscure. In modern Hebrew the term denotes detectives. The commentators interpreted it as tax-collectors or scouts. We read about 'a troupe of *balashin* (of scouts/gentiles) which entered the city in peace-time...' (AZ 5.6). If they were indeed tax-collectors, equipped with wooden rods, the *balashin* may be identified as centurions or *beneficarii*, for both are known to be engaged in this task (Sperber 1969b; Speidel 1993, 146, 149).

(b) Maces, knobbed staffs and nailed heads

One of the earliest weapons, used for face-to-face combat, was the mace (Yadin 1963b, 11-12, 40-41). The basic construction method involved the attachment of a head to a wooden stick. In the early Near East the macehead appeared in many forms, varying from pear-like and circular forms to a more discoid structure, while others are adorned with spikes or imitations of ropes (*ibid.*, 120, 125 – bottom). Quite remarkably, the very early hoard of Nahal Mishmar (IL) already manifests the most elaborate shapes of maces and maceheads (Bar-Adon 1980). The mace belongs to the group of hand held shock weapons, which was in principle intended for use against unarmoured foes. It has also proven to be most effective against enemy in motion i.e. against cavalry. An attestation to the popularity of this arm may be found in the special artistic attention it won, such that has yielded large variation as well as highly decorative heads. The rulers, particularly in Egypt, soon adopted the mace as one of the symbols of authority (Yadin 1963b, 124-125; for Trajan, see below). Simultaneously, the mace was commonly used in ritual activity (below).

A distinctive decline in its employment is discernible following the introduction of the helmet, a tendency that intensified in the following millennium. During the classical periods we rarely hear about the employment of maces in the battlefield. It appears to cease to exist as a standard fighting weapon in the Hellenistic and Roman armies. However, this was not the case in the east (and apparently not in Gaul and Germany as well).[11] Herodotus tells us about the equipment of the Assyrian: 'They bore...wooden clubs withal studded with iron...' (Herod. 7.63). The Arabians are there reported to be similarly equipped (*ibid.*, 7.69). The picture that emerges from the historical and archaeological evidence is of a provincial employment versus the institutionalised disregard. Still, the mace preserved its symbolic and ceremonial functions. In a stone relief from the Temple at Esna (EG), Trajan is depicted dressed as a Pharaoh, smiting his prostrate enemies with a mace following the traditional setting. In addition, the mace was employed by the *popae* or *victimarii*, during sacrificing, to stun the animal before the slaughter (Pollen 1874, 60). The exclusion of this weapon from the 'official' Roman arsenal is probably the reason for the scarcity of historical references to its employment. But, what is true for the Latin sources is not necessarily reflected in the ancient Jewish literature. On the contrary, the state of affairs that is gleaned from the rabbinical sources is that of an ample use of maces, dressed in varied types and shapes:

> 'A rod on whose top he fixed a nail like a sort of a *hazina*, is impure. If he put nails into it, it is impure. R. Shimon says: Not unless he put into it three rows. And all of them, if he fixed them for decoration, are pure. If he fixed on its top a

[11] Tacitus informs us that the German tribe *Aestii* fought with a club (*Germ.*, 45; below).

> [metal] domed head, and similarly with the door, it is pure. If it was a utensil and he attached it to it, it is impure. When does it become pure? Bet Shammai say: When he impairs it. Bet Hillel say: When he attaches it' (Kel 14.2).[12]

Maimonides regarded the entire paragraph as an assemblage of ruling relating to varied types of clubs. He regarded the first as a macehead with the outlines of a pomegranate.[13] However, it is hard to accept this interpretation, for the noun *hazina* (חזינא or חצינא) derives from Aramaic, in which it designates an axe or a pickaxe (Dalman 1922, 141, 158). The first phrase then must relate to a stave, with a spiked head, whose outlines resembled that of a pickaxe and was used for beating (also T Kel BM 4.2). It closely accords Arrian's narration that Roman cavalrymen 'also carry small axes with spikes in a circle all around' (*Tact.*, 4.8). In the above *Mishnah* Rabbi Shimon discussed the varied nailed, or spiked, staves. The latter utensil is pure as long as its head has less than three rows of spikes. Such an arrangement, of three rows, is of particular interest for it accords with actual examples of spiked maceheads from the Principate. Two bronze maceheads are reported from Amiens, Somme (FR) (Boucher, Perdu and Feugère 1980, 33, Nos. 222-223). The objects were originally fixed to the heads of wooden staves. Both heads exhibit a series of quadrangular points, arranged in three lines, neatly corresponding to the ruling. A very similar object derives from Dura-Europos (James 2004, 190, No. 647, Fig. 114) (**Fig. 24: 5**).[14] Additional examples were reported from Greece, Italy and Salzbourg (DE) (**Fig. 24: 1**; *D&S*, s.v. 'Clava', Figs. 1581-1583). It is further depicted on a sarcophagus from Rome and a relief from Arles (FR) (**Fig. 24: 4**a-b; Couissin 1926, Figs. 144-145), while a spiked knobbed head is described in a painting from Villa Albani (IT) (*ibid.*, Fig. 147) (**Fig. 24: 3**). A Romano-Byzantine macehead (*c.* AD300 or later) from the Museum of Fine Art, Boston retains the triple arrangement of spikes, while its shaft is decorated with two bands of Acanthus scrolls (**Fig. 24: 2**).

We further read about the domed head, which according to the *halachah* was similar to the door jam. This description indicates it was made of metal, and had presumably the shape of a cup (Sperber 1993, 82-83). Such a head seemingly equipped the stave seen on the relief from Büyük Kale (TR) (Speidel 1992, 190-191; see below).[15]

The above citation also mentions the fixing of decorative metal fittings, which brings to mind a long wooden stave that was unearthed in Jordan, the head of which was decorated by four rows of silver studs (Harding 1953, 11, Pl. IV: 2, 5-6).

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[12] Kehati (Kapah ed.), with my modifications.
[13] *Ibid.*
[14] One should reject James's claim that a group of spiked objects from Mauritania (Boube-Piccot 1994, Nos. 226-230) are maceheads (2004, 190) as they are clearly caltrops.
[15] Forestier 1928, 105.

Knobbed staff

Second in command to the centurion was the *optio*. The archaeological and representational evidences indicate that this rank was distinguished by a knobbed staff and a ring bearing its title. The image of the *optio*'s staff is clarified by tombstones from Chester (UK) (*RIB* 492; Anderson 1984, 45, left) and even more significant from Apamea (SY) (Sumner 1997, 20, left). The staff consists of a round head that crowns a seemingly wooden shaft.[16] A slightly different head was mounted upon the staff of a *decurion* that served in the *equites singulares Augusti*, exhibiting elliptical outlines (*ibid.*, 20, right). A knobbed object that was described as a 'heavy cast plumb weight' from Chichester (UK) seems to be in fact a macehead (Down 1978, 296, No. 50, Fig. 10.33). None of these artefacts are known from Palestine, yet we posses a skeletal testimony to their employment. A skull from Ein-Gedi (IL) exhibits a depressed elliptically shaped trauma (**Fig. 24: 7**). This feature was seemingly formed by a blow from a knobbed macehead (**Fig. 24: 6**).

The 'golf-club' baton

A tombstone of a police officer, from at Büyük Kale (TR), portrays the mounted deceased and three of his companions (Speidel 1992, 190-191). The latter are equipped with what was described as 'a small oval shield on a baldric, and what seems to be a curved stick or club. The one to the right also holds a mace' (*ibid.*, 190). These curved artefacts appear to consist of a straight haft from which stems a golf-club like segment. Interestingly, the man to the right appears to carry both a curved stave and a mace. Even though there seems to be, at first glance, little reasoning in carrying both a club and a mace one must consider the task that the police faced during those days. The main function of the police force was to enforce public order on non-military populations, a task that required the use of less lethal weapons. This rationality stood behind Pontius Pilate's decision to send his disguised soldiers against the rioting Jews in Jerusalem 'with orders not to use their swords, but to beat any rioters with cudgels' (*BJ* 2.175-176, 2.325; *AJ* 18.61-63).Wooden staves were standard equipment among the policing and tax-collecting forces (Speidel 1992, 190-191). A hint as to the appearance of these curved elements may be found in the *arena*. The ancient sources noted the *paegniarii* who fought a knockabout combat during the intervals, as an act of jest (August 1972, 65). A mosaic from Nennig (DE) portrays two such combatants; one of them is equipped with a stave and a crook-like weapon, while his rival holds a whip and wields a similar curved weapon (**Fig. 25: 1**).

[16] Sumner 1997, 19, 22 (bottom).

(c) Fustis

The *fustis* comprised an important place in the lines of the Roman army (Speidel 1993). It formed part of the Roman arsenal (*BJ* 6.261-263), and was brutally used by the soldiers as one of the capital punishments (*fustuarium*) (Polyb. 6.37). This execution method resembles that implied by the priest cadets in the Temple of Jerusalem (Sanh 9.6; Sanh 81_b). Such splitting of the skull appears to leave a very distinct pattern of trauma on the cranium. The very pattern of such an assault was identified in the 'ashlars tomb' at Ein-Gedi (IL). This blunt trauma had 'a clear external border (either rounded or diagonal in shape), with radiating and concentric lines (spider-net-like pattern)' (Hershkovitz *et al.* (forthcoming)). It accords the pathologies observed on skulls from Austria and Germany (**Fig. 25: 2**; *NHM* 1996, 44, Taf. 15D). According to Hegesippus, the terminal act in the execution of James (Jacob), the brother of Jesus, involved the splitting of his head by a 'club (*τὸ ξύλον*) with which he beat out clothes' (Eusebius *Kirch.*, 2.23.11).[17]

(d) The 'carrier of the zmorah' (vitis)

Several rabbinical references appear to contain interesting information regarding the *vitis* and its employment in Palestine during the Roman reign. The Hebrew word *zmorah* means a vine shoot (Jastrow 1950, 402). As noted above, the latter was used by the Roman commanders as a punishing tool (*vitis*), and no less as a status symbol. Indeed, the Jewish sources note one *ba'aal ha'zmorah* (בעל הזמורה) – that is the 'carrier (lit. owner) of the *zmorah*' (Shab 145b; T Sot 15.7; *Ex R* 21). Ben Yehuda asserted the *zmorah* to be the Hebrew version for the Roman *lictor* (*BY* 1350). However, the apparent symbolism of the *zmorah* and the fear of people from it, as will be shortly demonstrated, are clearly traits linked with the *vitis*.

In the *Babylonian Talmud* we read that: 'R. Hanina said: There is no single festival when there did not come to Tiberias an *agmon* and *qamton* and *ba'aal zmorah*' (Shab 145_b). The above three titles are seemingly attributes of Roman officials, presumably of military position (Krauss 1948, 192). *Qamton* is thought to designate an attendant of the officials – the *comiton* (Jastrow 1950, 1333). The term *agmon* denotes a general, as it corresponds with the Greek *ἡγεμών*; it also appears as הגמון (*BY* 1039; Jastrow 1950, 331). However, difficulties may rise from the earlier source that similarly pronounce the hierarchy of the Roman officials:

> '...One in town who went bed, so they gave him over to the carrier of the *agmon* that (whipped him so hard) that he had to be banded, but he was too hard for the carrier of the *agmon*; They gave him over to the carrier of the *zmorah* that (beat

[17] Explicitly listed as a weapon – מנפש (T BM Kel 3.1; above).

> him so hard) that he had to be banded, but he was too hard for the carrier of the *zmorah*; They gave him over to the carrier of the *re'tsuaa* that slap him, but he was too hard for the carrier of the *re'tsuaa*; They gave him over to the governor (*shil'ton*) that throw him into the furnace' (PT Sot 9.12 24_b).[18]

Offenders of the provincial order, as here demonstrated, have been severely punished by varied means. Turning back to the *zmorah*, it is not surprising to witness the extent of diffusion of the *vitis* into the lives of people in Palestine as it is reflected in the Jewish sources. Like any nation under foreign rule, the Jews suffered from the oppression of the authorities, and most frequently inflicted by its common representative, the centurions. The linkage between the *vitis* and the post it symbols is further attested in the *Midrash*:

> 'Since thou art in My power, and the sea also is in My power, I have already appointed thee as its commander, as it says, '*And lift up thy rod*' (Ex 14.16)
>
> R. Simeon said: It is like an officer who was walking about in the street with the *zmorah* in his hand. People said: 'Were it not for the *zmorah* in his hand, he would not receive all this honour.' When the king heard this, he said, 'Put aside the *zmorah* and walk out into the street, and if anyone fails to greet thee, I will behead him.' This also what the Egyptians said: 'Moses cannot do anything without his rod; for with it he smote the Nile and brought on us all the plagues.' When the Israelites went into the midst of the sea, with the Egyptians standing behind them, God said to Moses: 'Cast away thy rod, so that they do not say: "Were it not for the rod, he would not have been able to divide the sea,"' as it says, *And cast away thy rod*' (21.8-9).

Midrash Rabbah to Numbers provides us with one more example:

> 'A king had numerous servants. He chose to make one of them a free man and to give him the *zmorah*. He then went further and made him a senator.' (21.8-9).

In Midrash *ADRN* we read about the: 'sword and the bow and the spear and the knife and stick and the *kikonot* (קינקונות)' (*ADRN* 40a). There is a clear resemblance between this word and the *knokonot* (קנוקנות) that is interpreted as the tendril (Hul 92). Clearly associated with the vine, and as the word appears to derive from the word 'cane' (קנה), *kikonot* may in fact designate a vine shoot (*vitis*) in the above citation.

[18] Neusner with my modifications; *cf.* T Sot 15.7.

(e) Bulrush

As attested above, one of the Roman punishment implements used in Palestine was the *agmon* (PT Sot 9.24). As the noun *agmon* derives from the Hebrew word for lake – *agam*, it was claimed by scholars to describe in fact a straight and flexible cane that grows in wet habitats like lakes and swamps (*BY* 45; Jastrow 1950, 13). However, these same scholars have regarded the אגמון (*agmon*), appearing elsewhere in the Talmud, as a version of the term הגמון (*hegmon*), denoting the Greek word *ἡγεμών*. This duplication needs a clarification, for if the word, indeed, derives from Greek, one must explain why the *Palestinian Talmud* refers to the *agmon* as a tool, carried by the 'carrier of the *agmon*'. It may be argued that the *agmon* in the *Palestinian Talmud* was the official's staff (*vitis*). But one cannot assert that the two nouns derive from different origins, as both Ben Yehuda and Jastrow do.

The *agmon* (reed) is noted in the Bible (Isa 9.13, 19.15, 58.5; Job 40.26, 41.12). It is identified as *Scripus laustris* (Zagorodski 1939, 10). The removal of the leaves provided a tool that could inflict severe bruises. According to the *NT*, the crucified Jesus was beaten by a reed (Mat. 27.28-29). Such items are still in use in the Middle East. One of the horrid torture methods reported to be used in Levantine jails is the *falaqa* that involves the whipping of the prisoners' feet with a cane. It is therefore appropriate to separate between the *hegmon* (הגמון) – the general, and its tool – the *agmon* (אגמון) – the cane; referring to the rank as: cane bearer.

Part III – Discussion

5. Sources for equipment study

After reviewing the nature of the assemblage in Part II, let us now turn to discuss the material in context, most notably in conflict lands. The second part of this chapter is dedicated to the interaction with varied related sources that shed more light upon the artefactual study, namely the archaeological, documentary and artistic evidences.

(i) The archaeological context

(a) The conflict environment

The decisive majority of *militria* that is presented here was discovered in conflict lands (**Fig. 1a**). Very few items were found in Roman military sites (p. 174ff), most of which still await excavation, while *militaria* from urban contexts of this period was little recognised (above). In addition to the paucity of excavations of such contexts, there are clear indications for the dominant place of metal recycling in urban Palestine (p. 222), a process that is naturally less represented in sites that were destroyed and abandoned, most notably following the Second Revolt. The recent decade has witnessed a boom in publication of studies that focus upon the archaeology of conflict. Key studies, such as the analysis of the conflict sites of Little Big Horn (US) (Fox 1993; *apud* 1997), Kalkrise (DE) (Schlüter 1993; *apud* 1999) and Dura-Europus (SY) (James 2004; *apud* 2005), demonstrated the potential of applying Keegan's 'Face of Battle' approach and particularly the usefulness of the tool of spatial distribution for deciphering the conflict environments and shedding new light on the course of battles (Coulston 2001; *apud* 2005). The outlines of the varied types of fighting spheres in early Roman Palestine have been recently presented and defined chronologically (Stiebel 2005b).

The majority of the fighting that took place in Palestine during the period of study was conducted between two non-equal forces, both in number and in the quality of their equipment, technology, organization and logistics. Except for the Herodian army (Shatzman 1991) that possessed all the characteristics of an institutionalised army, the key players in the encounters in Roman Palestine were the Roman army and rebelling Jewish militia forces. The nature of most of the documented encounters, either historically or archaeologically, in early Roman Palestine, generally falls under the categories of siege-warfare, urban fighting and subsurface operations. In siege warfare, the Romans enjoyed the technological advantage by possessing siege machinery and torsion artillery (Shatzman 1989; Coulston 2001, 42), while their training, organisation and logistic expertise provided them with a better starting-point in pitched battle. The discussion below is artificially separated for convenience of study,

although most of these categories overlapped in land conflict encounters. Whenever a battle did take place in the open field, and there were distinctly few such occurrences, the Jewish militia forces practiced guerrilla tactics as a rule and tried to avoid pitched encounters (*cf.* Beth-Horon battle). A constant attempt was made to draw the Romans into difficult terrain, in order to overcome their clear advantage in the open ground. On this background one should comprehend the growing importance the Judaean Desert had in the First and even more in the Second Revolt: 'To be sure, they did not dare try conclusions with the Romans in the open field' (Dio 69.12.3). These tactics were further used on a smaller scale in most of the sieges, as Josephus refers to rebels' sallies that were designed to spread havoc among the Romans and to destroy the siege machinery (hand-to-hand combats: Price 1992, 281-285; *cf.* Dio 66.4.4, 5.4, 6.1-3; mines warfare: below).

Most of the martial clashes between Romans and Jews in Judaea may be defined as cases of Low Intensity Conflict (LIC). The strategic outlines applied during the two major military events which produced most of our objects of study were recently laid down (Stiebel 2005b). In general, the First Revolt (AD66-73/4) is characterised by a 'centralised' attack scheme, according to which a victory over a region was achieved through the subjection of its major cities and small towns, into which inhabitants of the rural satellite-settlements have escaped. It is important to note that this was not a pre-planned over-arching Roman approach but rather the result of the defenders' strategy as the decision to fight siege-warfare rather than a pitched-battle has been in the hands of the defending side (Eph'al 1996, 11). The Roman campaign that opened in the Galilee, with the famous sieges of Jotapata and Gamala, was directed southwards through the Coast, Samaria and the eastern districts, the advancing routes closing on Judaea and its traditional capital – Jerusalem. Following the conquest of the city (AD70) and the triumphal march in Rome, the remote and difficult arid districts were left to be subjugated: Machaerus and Herodium (AD71) and lastly at Masada (AD73/4). However, the eruption of the Second Revolt (AD132-135) presented the Romans with utterly different opening conditions. Secret hideout systems that were constructed by the Jews under their rural settlements formed tricky fighting environments, which required the Romans to practice, in the same fighting zone, both urban and subsurface warfare tactics. The rebels intentionally shifted their strategy into a scenario of classical LIC, forcing the Romans to conduct a costly campaign that required the conquest of each and every village. The only exception appears to be the siege-battle of Bethther (V.6). The results after four years of rebellion were disastrous to both sides; the Roman suffered an exceptionally large number of casualties, whereas the 'whole of Judaea was made desolate' (Dio 69.14.1-3).

It needs to be stressed, maybe in contrast to the picture that emerges from the above, that the early Roman period in Palestine was not characterised by constant military clashes. It is therefore especially frustrating, from an archaeological point of view, that these intervals,

which have extended over much more time compared with the duration of conflict episodes, are materially so poorly represented. The lack of *militaria* from urban contexts which was deposited during peaceful periods is seemingly the result of both shortage of excavations of such contexts and mainly a reflection of the fact that less material tends to stratify during non-violent episodes. As archaeology appears to be silent regarding the nature of *militaria* in the nonviolent periods, it is left for us to use the historical data when available and chance discoveries like Ascalon's wreckage (II.3), or Cave VI/52 (IV.2). It is hoped that the gap in our knowledge will be partly filled following the future publications of the excavations of the Upper-City, Jerusalem and Caesarea. Despite the lack of archaeological data, extensive activity of the Roman army took place during the nonviolent periods. Isaac noted that 'most soldiers never took part in major expeditions, but that should not influence our judgment of the Roman aims in the area' (Isaac 1992a, 53). He defines one of the major functions of the Roman army in the East as the enforcement of political and economic control (*ibid.*, Ch. II-III). In the East we commonly find the bases of the Roman army within the boundaries of cities (*ibid.*, 269-282). Such a state of affairs complicates the question of ownership and identity. Moreover, one must take into account that weapons and equipment were commonly stored in civil settlements (pp. 260-261). In Palestine, units were located at Caesarea, Jerusalem and Samaria, while legionary contingents were posted in Scythopolis and Neapolis (Stiebel 1999, 90) and possibly in Yoqne'am (II.2). Further auxiliary presence is attested in Hebron (Speidel 1979; AE 1979.633) as well as at Ein-Gedi (Lewis 1984, No. 11). Besides security and military tasks per-se, there were other considerations behind the positioning of the Roman units. The presence at Ein-Gedi was related to economic interests, the controlling of the *balsam* trade. The information concerning the activity of the Roman army as an occupation force appears to be enriched by the rabbinical sources as illustrated above (p. 150ff). However, reviewing the available sources to the military historian of the Roman East, Isaac turns strongly against the potential of constructive contribution of archaeology (*ibid.*, 6-7; *contra* Alcock 1994, 793-794). The intensifying number of material culture studies in the Near East and particularly those of martial objects which echo social and cultural interactions with Rome (James 2004; Ch. 6), signifies archaeology as more than a legitimate source most notably when history is silent. Returning to the physical evidence that forms the core of the study, I turn now to examine the contribution of *militaria* to the study of conflict landscapes.

(b) Land conflict archaeology

The archaeology of Roman conflict has recently been enriched by fundamental discussions based upon extensive field studies (Coulston 2001; *apud* 2005 – with extensive bibliography). As noted above, one of the archaeological tools that were found to be very

useful in the illustration of the course of battle has been the plotting of *militaria*, particularly small projectiles that tend to get lost in the rage of battle and avoided in post-battle foraging activity. Spatial distribution analysis was convincingly applied in the reconstruction of the pitched battle of Little Big Horn (Fox 1993; *apud* 1997), or in the portraying of the urban warfare at Olynthos (Lee 2001). On many occasions, the plotting tool was nearly the only available source when the historical evidence was thrifty in words if not silent. In the case of Herodium, Josephus dedicated one sentence alone that describes the battle of AD71 and it was left for the archaeological evidence to enrich our knowledge concerning its capture (Stiebel 2003a, 220-221). The plotting of the clusters of the very big rolling stones, which laid in the original place of rest, seemingly reflects the pattern of the Roman attack (**Fig. 26**). This analysis further proved fruitful in Kh. Qumran, regarding the actual conquest of which nothing was yet written. My plotting of the arrowheads that were uncovered at the site, which has been a point of contention for generations of scholars, seems to provide for the first time an insight into the martial occurrences and the way the site was captured (III.17). Their distribution suggests that the site's tower was the major target for the incoming Roman fire, while the relatively small overall number of projectiles found there (including one catapult bolt) may reflects the relative ease by which the attackers achieved victory over this unfortified small site in AD68. The use of artillery machines even against small sites and refuge caves (III.5; V.20) reflects Roman might and its logistical meticulousness. The discovery of an artillery projectile, a tie-hoop and a *pilum* head appear to correspond with the historical reference that identifies the Roman force as *legio X Fretensis* (III.17; *BJ* 4.437-439). Still, from the point of view of land conflict archaeology the siege-battle sites of Jotapata, Gamala and Masada stand out, as we posses for all of these both historical and archaeological evidence. The battle of Jotapata is described in detail by Josephus (Gichon 1995a). Nevertheless, as noted in the catalogue entry, the assemblage of *militaria* was not available for study and thus is excluded from the present analysis (III.2). In the next section, I will provide insights into the sieges of Gamala and Masada.

Sieges

The ancient form of siege warfare was very conservative in nature (Eph'al 1996) and its principles did not alter much between proto-history and the Hellenistic and Roman periods (a general review: Coulston 2001, 31-42). Only limited attention has been given in research to the archaeology of the sieges in Roman Palestine and until recent decades it was based upon aerial photographs and surveys rather than excavations. Most of the studies focused on the First Revolt (*ibid.*, 36-37; Syon 2002; Adan-Bayewitz and Aviam 1997; Aviam 2002; Hawkes 1929; Schulten 1933; Richmond 1962; Goldfus and Arubas 2002). The sieges of the two Jewish Revolts significantly differed in nature and magnitude. Whereas the First Revolt is very much typified by sieges of the country's cities and forts, during the Second Revolt the

Roman army targeted rural settlements, hiding complexes and refuge caves. To date only one siege-system of a city is known from the Second Revolt – Bethther (V.6).

In a recent study I have discussed the conduct of sieges in Roman Palestine (Stiebel 2005b, 99ff). Examining initially the geographical deployment and belligerent actions of the assaulting Roman army in light of the archaeological finds, one identifies several circles of activities in the siege battlefield space that operated concurrently (**Fig. 27: 1**). The external circle comprises of siege camps, circumvallation, construction and logistical areas and the heavy artillery engines. The walled courtyard found west of Masada was identified as a 'Bauplatz', used for logistic purposes and for construction activities of siege machinery (**PL. III.20: 1**; logistics: Roth 1999; below). Just near it, adjacent to the natural knoll, I have identified a position of the Roman artillery machinery (discernable in Hawkes 1929, Pl. I). One of the marked advantages of the Roman army was its torsion artillery force, which may be archaeologically represented by either metal parts of its machines (none of which was found in Palestine) or more commonly by the projectiles. An accidental find at Gamala seems to mark the position of the machines facing the city. During the construction of a service road a heap of over two hundred balls was found. This concentration point of ammunition, overlooking the central section of the city's wall, presumably indicates one of the Roman artillery emplacements some 300m from the wall. As I have demonstrated, the *ballista* balls were produced at the site of the siege (Stiebel 2003a, 220). The Roman artillery at Gamala targeted the breaches, and filled many of the rooms along the walls. It is interesting that 'except at the main breach and the synagogue area, the major concentrations of arrowheads and *ballista* balls along the wall do not overlap' (Syon 2002, 141). It seems that at Gamala the arrowheads were used against specific human targets that protected the breaching sectors while the artillery was further employed to bombard areas that did not come under direct Roman attack, but endangered its operation (below). At Masada, a large number of balls may have been removed from the breach and dumped near L.1039 (**Fig. 27: 2**; Holley 1994, 360; *contra* Netzer 1989; *apud* 1991), although the plotting of the balls appears to reveal the tentative Roman fire lines (**Fig. 28**). The Romans employed torsion artillery in a variety of siege scenarios; hence, in addition to large cities and forts, the Romans manifested its strength in its full magnitude targeting small settlements and refuge caves as well (III.1/M.1; III.17/M.1; V.6/M.1; V.13/M.1). My deduction of the employment of *manuballistae* in the Roman arsenal in light of the find at the Pool Cave (V.20/M.1; Stiebel 2005b, 105) was recently confirmed by the discovery of such a machine at Xanten (Schalles 2005). In the outer circle one may further find evidence also for the defenders fire, like rolling stones (above).

Drawing closer to the walls one would have found the lighter artillery engines, slingers and archers. Josephus tells us about the participation of Arab archers and Syrian slingers in the sieges in Judaea (p. 215). The missiles that they have launched were uncovered scattered

along and within the immediate vicinity of the walls. As in the rest of the Empire the most popular type was the iron tanged trilobate arrowhead. Some sixteen hundred arrowheads were found at Gamala, most of them outside the wall. The large concentrations of arrowheads correlate to the missing sections of the walls. In addition to the trilobate head, flat tanged and bodkin heads were found in three different focuses. The excavators suggested seeing in them: 'evidence of auxiliary ethnic archer units, some of which may have used "traditional" arrowheads alongside the "standard" Roman issue' (Syon 2002, 145). However, since a standard Roman archer was a member of the *auxilia*, the small number of these heads may suggest an employment due to a special requirement, like shooting bodkin heads against armoured rivals (Stiebel 2005b, 100).

Close to the walls one would have met the infantry that were engaged in the construction of ramps, mines (below), the shifting of towers and battering rams. The ramp at Jotapata was coated by a layer of mortar in which one finds embedded trilobate arrowheads that were seemingly shot by the defenders (**PL. III.2A: 1**). Josephus mentions the coating of the ramp at Masada by stones compacted (or fit) together (*BJ* 7.307), which is seemingly represented at the site by the black stones that are scattered over its slopes (Dan Gil, *pers. comm.*). One of the main threats was the battering ram. So formidable was its impact that the defenders of Jerusalem nicknamed it '*Νίκωνι*' – 'Victor' (*BJ* 5.299). Many counter measures were employed by the defenders in an attempt to destroy, damage or buffer the operation of the battering-ram. In addition to the use of firebrands and burning liquids, the commonest device appears to be the stone. The defenders threw down from the battlements any kind of projectile they could lay their hand on, like round shaped rolling-stones (I.1/N.1; Stiebel 2003a, 219, 239-240; *apud* 2005b, 101), boulders (*BJ* 3.229-230; *cf.* Aen. *Tact.*, 32.5-6), stone mangles, mill-stones (Stiebel 2005b, 101) and pillar drums (*apud* 2003a, Fig. 3). In 2001 we excavated the breach at Masada, just above the head of the Roman ramp. In addition to arrowheads, *ballista* balls and slingshots we found a near complete solid wooden wheel (**Fig. 29: 1**; Stiebel 2005b, 101). The discovery context may indicate that the wheel was intended to be re-used as a projectile, for which we posses both ancient historical and representational references (Veg. 4.8; **Fig. 29: 2**). In addition, one reads about the use of chains (Yadin 1963b, 393; Ussishkin 1989, 107-8, Fig. 21), ropes, lassos and nooses (*laquei*) (Dio 66.4.4; Aen. *Tact.* 32.4; Thuc. 2.76.4; *BG* 7.22.2; Livy 36.23.2 and Vitr. 10.16.12) as well as hooks (Dio 66.4.4; Polyb. 8.7; Veg. 4.23). Further use was made of deflecting and fending-off devices, like 'thick planks', which were 'fastened together and strengthened with iron' (Dio 66.4.4; Thuc. 2.76.4), quilted blankets (*centones*), mattresses (*culcitae*) (Veg. 4.23) and sacks filled with chaff (*BJ* 3.223-224; Aen. *Tact.* 32.3). In order to tackle these apparatuses the Roman used among others the *falx muralis*, a unique example of which was uncovered in the large breach of Gamala (below, p. 180). Even after the wall had been breached there were still optional measures for the

defenders to take. Josephus describes the erection of a counter or secondary-wall that was constructed from wooden beams and soil at Masada (*BJ* 7.311). Possible evidence for its existence was deduced form the plotting of the conflagration pattern of the structures at the site (Netzer 1989; *apud* 1991). Setting this wall ablaze, against which the rebels at Jotapata used rawhides as fire extinguishers (*BJ* 3.234), paved the road to the Roman conquest of Masada. The most vivid archaeological evidence applies to the Roman breaching of Gamala:

> 'With such a multitude of hands accustomed to the task, the earthworks were rapidly completed and the engines brought into position... The Romans then applying the battering-rams at three different quarters broke through the wall, and pouring through the breach with loud trumpet-blasts, clash of arms, and the soldiers' battle-cries, engaged the defenders of the town. The latter, when the first Romans entered, for a time held their ground, arrested their further advance and stubbornly repulsed them; then, overpowered by numbers pouring in on all sides, they fled to the upper parts of the town, where, rounding upon the pursuing enemy, they thrust them down the slopes and slew them while impeded by the narrowness and difficulties of the ground' (*ibid.*, 4.17, 20-22).

The occurrences within the boundaries of Gamala are discussed in the next section. Interestingly, despite the fact that the closing siege-battle of the First Revolt at Masada (AD73/74) is one of the most famous battles in the history of the province and was a subject for numerous studies, never has a full attempt to bring together all the archaeological data, most notably the *militaria*, been undertaken. Recent years saw a growing criticism regarding the common understanding of the course of battle as it was presented by Yadin, based on his excavations and an analysis of Josephus's account. The scope of the new data (including aspects that were omitted from the thesis, like artillery) negates me from presenting here my detailed insights as to the occurrence of the siege, save for a few points of interest. Several scholars denied the actual completion of the Roman siege as noted by Josephus, claiming that the defenders surrendered to the Romans (Goldfus and Arubas 2002, 210), while others assert that further *intramuralis* fighting took place following the breach of the wall (Geva 1996; Eshel 1991). Our recent excavations of the breach at Masada provide first hand testimony for the battle that raged there, most notably an assemblage of projectiles of varied kinds (Stiebel 2005b, 101). In light of the analysis of the distribution of small projectiles from Olynthos, namely the arrowheads and slingshots, which provided a pattern of urban fighting (Lee 2001), it was interesting to compare it with the pattern that emerged from the plotting of the arrowheads at Masada (**Fig. 30**). Despite the fact that there is no typological differentiation between the Roman and rebels' arrowheads the picture appears to be distinctive enough to allow the attribution of the heads. It totally differs from what one would anticipate seeing in

case of urban fighting, that is small concentrations of arrowheads shot into the dwelling quarters at short range (*ibid.*). Nearly no arrowheads were found in the casemate wall that was used for dwellings during the revolt, clearly indicating that no *intramuralis* fighting took place at the site. On the contrary, the distribution of the arrowheads appears to reflect instead the activity of the defenders within the site: two local smithies (Loci 442, 456), foci of storing points of arrowheads (Loci 126, 368, 8-9, 16) and a few specimens found in towers that were used for individual storing by the rebels. Other assemblages of arrowheads were uncovered in what appears to be strategic points: near the gates (Loci 189, 174, 1276) and in controlling points along the western section of the wall (Loci 1264, 1273) that were manned by local warriors and at which the Roman archery was shooting. This is further applicable for the breach area (Stiebel 2005b, 101) and the section south of the synagogue (Loci 1054, 1039) and to the sporadic finds along the western section of the wall and Western Palace, which seems to represent Roman shooting or overshoots. This notion that contradicts Roman urban fighting at the site and assigns most of the distribution of *militaria* within the site to the rebels' activity is also corroborated by the distribution pattern of armour scales (**Fig. 31**). Over 1000 specimen were found at Masada, supposedly reflecting an intensive martial activity. However, the decisive majority of the scales that seemingly date from Herod's time never came to use, being intended to serve as spare scales. The picture that emerges from the spatial distribution clearly indicates that no urban fighting took place at Masada.

Urban fighting

Urban fighting, also known today as FIBUA (Fighting in Built Up Areas)[1] in British military terminology or MOUT (Military Operations on Urbanized Terrain) as the US equivalent term, is the stage that followed a successful penetration of the assailant forces over, through or under the wall. It presented the attackers with a sharp change of combat environment, from the relatively defined and controlled extramural zone into a densely built sphere. One of the major complications of FIBUA is the operation in a three-dimensional environment with limited fields of views and fire. The attackers generally moved in inferior positions, being exposed to fire of the defenders that shot from controlling higher elevations, such as roof tops. A further difficulty is the lack of orientation. Unless possessing information extracted from captives, deserters or spies, intramural fighting required advancing in an unknown territory, facing the grave danger of getting lost in the maze of streets that characterised many Levantine cities. The failing Roman attack at Gamala vividly portrays these dangers that resulted in numerous casualties from the Roman side due to the collapse of *intramuralis* buildings (*BJ* 4.1ff)

[1] Also OBUA (Operations in Built-Up Areas).

'The Romans, unable either to repel the enemy above them or to force their way back through their comrades pressing forward behind, took refuge on the roofs of the enemy's houses, which came close to the ground. These, being crowded with soldiers and unequal to the weight, soon fell in; one house in its fall brought down several others beneath it and these again carried away those lower down. This disaster was the ruin of the multitudes of Romans; for, having nowhere to turn, although they saw the houses subsiding, they continued to leap on to the roofs. Many were buried by the ruins, many in trying to escape from under them were pinned down by some portion of their persons, and still more died of suffocation from the dust. Seeing in this the interposition of divine providence, the men of Gamala pressed their attack regardless of their own casualties; they forced the enemy, stumbling in the steep alleys, up on to the roofs and with a continual fire from above slew any who fell. The debris supplied them with boulders in abundance and the enemy's dead with blades; for they wrested the swords from the fallen and used them to dispatch any still struggling in death. Many flung themselves from the houses when in the act of collapsing and died from the fall. Even those who fled found flight no easy matter; since through their ignorance of the roads and the dense clouds of dust they failed to recognize their comrades and in their bewilderment fell foul of each other' (*ibid.*, 4.23-29).

During the season of 1982 the remnants of the entire equipment of a Roman legionary (L. Magus) of *legio V Macedonica* were found together in a narrow alley near the wall of Gamala (Area T – L. 4019), covered by a collapse of stones (**Pls. III.3A: 2-3, III.3G: 1-2**). The assemblage comprised a complete cheekpiece and browguard, parts of the upper unit of a '*lorica segmentata*' armour, the handle of a *pugio*, a silver-plated tip of the *gladius*'s scabbard chape, a strengthening bar of a *scutum* and an ownership tag. As not all parts of the panoply are present and nor were his bones found, it seems most likely that the soldier was either dragged wounded from the collapse, or that his body was cleared by the rebels during the month that followed the attack, leaving part of the equipment behind. The assemblage is highly interesting for it reflects the actual combat panoply of one soldier that fought in Judaea in AD67. Moreover, indications of battle damage and unique variations are discernable on the equipment. The excavations of the city's remote quarters (**PL. III.3: 2**) revealed scores of *ballista* balls, catapult projectiles and trilobite arrowheads. This assemblage represents the artillery fire, that was shot from the wall, a distances of *c.* 350m, in support of the assailing Roman soldiers, combined with the arrowheads that were used in close range fighting (*BJ* 4.72ff; *cf.* Lee 2001). *Intramuralis* fighting is further indicated by the group of 5 arrowheads uncovered on the floor of the 'frescoed room' at Jotapata (Aviam 2002, 128). The most prolonged urban fighting campaign in Roman Palestine took place in AD70. The battle of

Jerusalem required the Romans to overcome three sets of walls and a strongly fortified Temple compound, meticulously detailed by Josephus (*ibid.*, 5-6). The final phase was the conquest of the Upper City which had been the living quarter of the priestly and wealthy circles (III.12). The conquest of their dwellings that were built as close units would have necessitated a large number of soldiers and endangered them gravely. The discovery of the skeletal remains of a woman's hand and a shafted weapon in the basement of a priestly mansion indicate the efforts required from the Romans in order to subdue one such house fighting in its rooms, basement and associated tunnels and water cisterns (below). The Romans solved this problem by setting the houses on fire (*BJ* 6.402ff).

Underground and cave warfare

Underground fighting has been conducted both in siege and urban warfare. Josephus's descriptions of the sieges of Jotapata, Gamala and Jerusalem provide ample examples of such an activity, in which both opposing sides were engaged. Assailant parties constructed mines either in an attempt to penetrate into the besieged city, to intercept defenders' mines or to trample down battlements. A dramatic illustration for such martial activity, resulting in the collapse of a tower and the sealing of a countermine and the deposition of an exceptional assemblage was uncovered at Dura-Europus (James 2004, 233-236; *apud* 2005). The defending force was engaged in similar activity, directed against the besiegers' mines. Josephus further notes the common construction of mines intended for sudden sorties, as well as to destroy Roman earthworks and siege machinery using a highly inflammable mixture of 'dry tinder, with the addition of bitumen, pitch, and sulphur' (*BJ* 3.228). A similar Sassanian employment of straw, bundles of wood, pitch and sulphur crystals was detected in the countermine under Tower 19 at Dura-Europus (du Mesnil 1944, 14; James 2005, 201ff). Mines were further dug in order to allow the provision of supply, reinforcement, or as an escape route. The tools that were utilised in mining probably depended on the specific terrain that the miners met. In rocky ground they did not differ in all likelihood from the period's mining tools, however in softer terrain edged weapons were suitable for the task (Eph'al 1996, 73, notes 122, 142 – with references): 'and he shall set engines of war against thy walls, and with his swords he shall break down thy towers' (Ezek 26.9). The soldiers were presumably further furnished with hooked-like implements that enabled the extraction of stones from the fortification, akin in shape to the tools portrayed on Assyrian siege reliefs (BM No. 124554). Underground warfare also formed part of Urban fighting (above). Most houses in the Near East had basements and underground cavities, like water cisterns, some of which were used as or converted into hideout spaces. In Jerusalem, for example, ample use of such installations was made throughout its history, and in the period under discussion most notably towards the end of the siege (*BJ* 6.370).

A unique underground fighting environment awaited the Romans in Judaea during the Second Revolt, very similar in nature to the net of tunnels and sub-terrain passageways the US army faced in Vietnam. These hiding complexes were constructed right under the houses of the rural settlements (Kloner and Tepper 1987; Zissu 2001). In the Judaean Desert the rebels found refuge in karstic caves (Eshel and Amit 1998a). Caves were commonly used in Palestine as asylum locations since a very early age. Herod operated special equipment to subdue rebelling forces that sought shelter in the cliffs of Arbala (*AJ* 14.421-430; *BJ* 1.309-313). The harsh terrain of the Judaean Desert provided rebels throughout history with an ideal location for hiding (1 Sam 24, 1ff). The furious reaction of Titus to the request of Jewish deserters from Jerusalem to be released to the desert reflects the Roman awareness to this problem (*BJ* 6.351-353). The plotting of the *militaria* from these caves indicated the existence of watch-posts in their mouths and nearby terraces. In not a few refuge caves, arrows and arrowheads were found in their entrances. Although this find may be interpreted as a remnant of Roman fire, the fact that the mouths were commonly out of Roman bow-range, indicates this equipment was in the possession of the rebels, possibly indicating the post of the guardsmen (V.14; V.15; V.25).[2] Arsenal-like contexts were detected in the inner-parts of caves (V.21/I; V.27/I; Stiebel 2004b, 123; for desert stashes – pp. 264-265). In addition to the besieging of such caves, as demonstrated by the two temporary camps above the canyon of Nahal Hever (V.24, V.26), the Romans conducted direct attacks employing light artillery machinery (V.20, V.13). In order to subjugate the extremely hazardous spheres of hiding complexes and refuge caves, the Romans further used fire and smoke to cause suffocation and/or to drive out the rebels. In modern terminology this tactic is known as support-by-fire tactic (SBF), the principles of which are clearly noted in the *Babylonian Talmud*: 'Smoke on us a house. Smoke on us a cave' (Yeb 115_a). Josephus describes the use of fire against cave dwellers at the Arbela (*BJ* 1.311) and actual testimony for this tactic is identified at Nahal Yattir Site (V.33; *cf.* Eshel and Zissu 1998a, 145). Aeneas notes the use of smoke, hornets and bees as anti-miner measures (Aen. *Tact.* 37). In order to hunt down the rebels and drive them out of the hiding complexes the Roman might also have used war dogs (III.6/A.1; Polyaenus, *Strat.* 2.25; Zissu 2001, 301).

(ii) Comparing sources for equipment study

In addition to the review of the environment of conflict from which most of the military artefacts have originated, there are several other archaeological contexts that have yielded martial material culture that are worthy of discussion, even just in order to raise the awareness of local archaeologists to their potential. This part offers a short introduction to the

[2] Some of the projectiles may found their way to the entrances due to sifting activity of illicit diggers.

archaeological sciences used in the thesis. In addition to the rich artefactual assemblage an unprecedented wealth of sources is available to the student of *militaria* in Roman Judaea. It is further dedicated to the examination of the interactive potential of available historical and religious texts, demonstrating that such an approach can draw beyond the narrow perspective of each of the particular fields. Following Johnson's observation, that if material culture is text (Mattingly 1997a, 15) than text is material culture (Johnson 1999, 31) the integrative discussions that are brought in the section which explores the texts of Falvius Josephus and of rabbinic literature demonstrate that the materiality of these texts can be studied via archaeological means. Lastly, in a province where the major part of its population had religious restrictions over the creation of artistic expressions it is interesting to review the relevancy of representational evidence to the study of *militaria* in Judaea.

(a) Archaeological contexts and deposition

Roman camps

An overall review of the excavations carried out in Palestine indicates that many military associated contexts have been revealed – from the early Judaean Desert fortresses, to the battle sites of the First Revolt and the hiding complexes and refuge caves of the Second Revolt. However, as far as Roman military sites concern only few have been excavated. Temporary camps were investigated mainly in the south of the country, like the two camps above Nahal Hever (Yadin 1963a) and more notably the siege system around Masada (III.20). Larger-scale excavations of permanent military bases, like the camps at Tel Shalem (V.2; Foerster 1976, *apud* 1978) or Legio (V.3; Tepper 2002) are a very important task left for the future. In the prolonged debate concerning the location of the *legio X Fretensis* camp in Jerusalem, little has the evidence of material culture been considered. In a recent article I have suggested a new location for the camp, using as part of the supporting evidence, for the first time, military associated artefacts (Stiebel 1999; *cf.* V.15).

Dumps

Several dumps were identified at the site of Masada. Some of the scorched heaps that were uncovered at the rebels' dwellings were associated by the excavators with the firing of the rebels' goods during the very end of the battle (*BJ* 7.394). A long-lasting dump was uncovered in a cave and small courtyard on top of the mountain during our recent excavations (Area N3). Among the numerous finds that were found there was a near complete *caliga*. Slightly southwards, Yadin's expedition discovered in L.1039 a dumping area that contained a large collection of documents (*Masada* III, 416-422), one of which is a rare salary documents of a Roman soldier (P. Mas. 722). One may also note the discovery of fragments of shield boards, pommel, and scabbard mount in this locus (*cf.* L. 92). Interestingly, a large group of *ballista* balls was found on the floor of the room, seemingly representing their

dumping from the roof of the nearby tower by the rebels (Netzer 1989). In the course of the recent excavations of Camp F at Masada a dump was excavated outside the camp's wall (III.20). It contained among other things metal scraps that indicate production in the field (pp. 247, 257).

'Hoards' and concealment of weapons

Archaeologists have been too often tempted to use the term 'hoard', which embodies ideas of mystery and glory. Unlike coins hoards that are may be taken literally as hoards (Meshorer 1997, 117-118; Weiner and Safrai 2001), it seems that the designation of the label 'hoard' to a concentration of weapons is subjective and the criterion for its use are rather vague. The discovery of how many weapons justifies the use of this term? What are the required conditions of the equipment, position and context upon discovery that make this classification viable? The determining of a concentration of equipment found in an excavation as a 'hoard', is often intended to emphasise its uniqueness and rarity in the archaeological record. However, it seems that often such a find is in fact a reflection of the real circumstances that existed in the site at the time of deposition rather than merely an isolated find. Examples may be pointed out at Masada: L1138 (Yadin 1965, 95-96) and to a certain degree also the finds at the Lower Terrace of the Northern Palace (*ibid.*, 16-17; *Masada* III, 167)[3], or the shafted weapons from the 'Burnt House', Jerusalem (III.12/H.1) and the Figs Caves (V.19/H.1).

Few cases of intentional concealment of *militaria* were found in Palestine; all related to revolutionary activity. The most striking evidence is the shafted weapon from Nahal Qedem (V.19/H.1), which was found as it was left by its owner leaning against the cave's wall, between rocks (**PL. V.19A: 1**). A possible act of concealment was observed in Cave VII/3, Wadi el-Mafjer, where two scales were uncovered under an arranged pile of wood (III.16/B.1). This explanation may be given to the scale armour from Sepphoris that was found under the skeletal remains of three canines (III.6/B.1). The two 'arsenals' of arrows found in the Judaean Desert's refuge caves, seems to reflect gathering of used arrows, which were seemingly intended for future employment (V.28; V.21). In the case of the 'hoard' uncovered in a cave near Hebron (V.31), the *militaria* was destined most likely for recycling following the ending of the Roman threat. Is scavenging of metal components behind the discovery of the *umbo* at 'Aro'er (III.21/E.1)? It appears that the concealment activities in these refuge caves ranged way beyond the Second Revolt. During the excavations of the Large Caves Complex (V.15), three Canadian rifles were found. Used by the Jordanian army the rifles were presumably hidden there during or following the Six Days War (1967).

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[3] I reject Yadin's conclusion that the *militaria* uncovered there attests the presence of a Jewish warrior.

Ritual burial of weapons

The differentiation in rationality between east and west is exemplified by the ritual treatment of weapons. The custom of cultic burial of weapons is far less common in the Roman east than it is in the west (Bishop and Coulston 1993, 37-38). An isolated discovery of a cheekpiece that was uncovered buried under the floor of a tent in Camp F, Masada may be explained in this way (III.20/A.1). This elucidation was given to the coin from the Jewish Revolt that was found there hidden under a large cooking pot sherd (Goldfus and Arubas 2002, 207). The unique deposition from Sepphoris of a scale armour suit with three dogs' skeletons might be explained as a ritual burial (III.6). Similarly, the phenomenon of water deposition of weapons (Bishop and Coulston 1993, 34, 37-38), which was very rare in the east, appears to be applicable for the lavish sport helmet that is claimed to derive from the Jordan river (p. 25).[4]

Tombs

It is quite remarkable that hardly any pieces of military equipment were used as entombment gifts in Roman Palestine. A Hellenistic burial from Jericho that is dated to the mid-2nd century BC contained a *gladius Hispaniensis* that was found placed in the shaft above the skeleton (Stiebel 2004a). The *sica* from Nahal David was excavated in a burial cave (I.7/F.1) although no detail as to its position was available. This is true also to a straight-backed dagger (Tomb 4) and a leaf-shaped arrowhead (Tomb 3) from Nahal Yattir Site (V.33), which might have been utilised as burial offerings – possibly indicating the status or just the sex of the deceased. The origin of a *spatha* from Kh. Tannūriyye was conjectured to be a tomb (V.1/F.1). The only type of *militaria* that was uncovered in direct relation with Roman military burial are iron hobnails that dead Roman soldiers were dressed in during the cremation ceremony. If the above scant evidence is not the result of a deficiency of archaeological excavations, this marked difference of traditions between east and west may be explained on a regional basis. This reason appears to stand behind the near absence of artistic descriptions upon military tombstones, which are very popular in the North-Western provinces (Anderson 1984).[5] Turning to the Jewish population in Palestine, a motif of the short sword/dagger was found on an ossuary from Bet-Zayyit, west of Jerusalem (**Fig. 17: 1**). This design appears to be a unique variant of the popular stylised palm tree motif, thus it is not clear whether it had any military association or whether it reflects the occupation of the deceased or the circumstances of death.

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[4] Although the provenance of the [state] of Jordan was initially provided (Baur and Rostovtzeff 1931, 183, Pl. 23, 1-4), a pencil remark on a photo in the PEF archives refers to the Jordan river. Nonetheless, recent information from the PEF archives indicates that the origin might have been the Qidron valley.

[5] One exception is a tombstone of a Moorish cavalryman (Avi-Yonah 1946, 93-94, Pl. XXVII.9).

Conservation

An examination of the cleaned military fittings has illustrated that conservation treatment was not always beneficial. The customary cleaning process of metal artefacts in the nineteen sixties and seventies, in particular those made of copper-alloy involved chemical cleaning. The aggressive treatment caused the removal of most of the plating and coating layers, such as silver, tin and niello. In the best-case scenario the rear face or the edges of the objects still bear meagre witness to the original condition (III.19/F.19). We hope that the increasing awareness for the existence of coating, plating and inlayed ornamentation on *militaria* will indicate mechanical cleaning as the sole technique for the adequate removal of oxidation products of metal. An additional problem relates to inadequate storage conditions. Military equipment in general, and particular ferrous objects, tend to suffer greatly from post-excavation oxidation if they are not properly stabilized. Gloomy examples are the Byzantine hoard of swords and bosses from Mammilla, Jerusalem (Aren Mayer – *pers. comm.*), as well as the 7th century helmet from the Temple Mount excavations, Jerusalem (Stiebel forthcoming c), the structure of which irreversibly deteriorated due to poor storage.

Scientific tests

Too little did the subject of *militaria* production in Palestine benefit to date from the possibilities that were opened in the second half of the 20th century through the rapid development of scientific analysis. This negligence brought about misconceptions regarding the traits of the arms, leading at times to erroneous understanding of the relations between *militaria* and ranks; *cf.* the so-called Tiberius sword (Bishop and Coulston 1993, 38, note 17). A cheek-piece from Gamala (III.3/A.1) was described as silver-plated, though in reality it was tinned. The excavators went further to associate the helmet and the rest of the *militaria* found with it to a Roman officer in light of the alleged opulent decoration (Gutman 1994, 85, Photo on p. 65; Syon 2002, 145). The reasons for this clearly anachronistic and unfounded perception lie in the erroneous identification of the coating metal. A scabbard mount from Gamala (III.3/F.10) that underwent severe cleaning treatment was described to be gilded, while in fact it is merely made of copper-alloy. Not only can metallurgical studies assist us to avoid misidentifications, but they may shed light on the production techniques and at times may assist in establishing the origin or even date of the find. Hence, the numerous scales found in the Lower Terrace of the Northern Palace at Masada, which were commonly associated with the First Revolt, appear to originate in the storerooms of Herod the Great (pp. 32-33). Yet, it is essential to combine typological study and the archaeological context coupled with the analysed data in order to gain a more well-founded understanding.[6] Due to

[6] Recent archaeometallurgical studies provide a most valuable data concerning production processes (Ponting and Segal 1998; Ponting 2002a; *apud* 2002b).

considerations of expenses, the use of radiography in this study was limited to certain objects, from Gamala and Masada. It proved particularly useful in the study of L. Magus' armour, on its sliding mechanism and repairs. The very well dated context did not necessitate C_{14} dating, although in the future such a test can assist in the calibration of the measuring equipment!

The most advanced biological technology was harnessed to explore the equipment produced from organic materials. In a joint project with Gila Kachila-Bar-Gal, DNA tests have proven to be a highly efficient and precise tool, which may provide information where no other test appears to be useful. Dealing for example with bows' ear-laths one faces a problem to identify the animal of origin, as the carving of the bone prevents morphological examination. The DNA fingerprint of an ibex, an animal endemic to the country, was detected in the analysis of an ear-lath from Masada (Appendix 1.1). The advantage of this method, should the extraction of material be available, is the decisive nature of its results. Botanical studies of the wooden objects from Masada and the cave of Letters granted us with important information. This could be compared with the data of the *militaria* from Dura-Europos, hence bridging the gap in our knowledge about production in the East during the first two centuries AD (Appendix 1.3 *(g)*).

A final example is the identification of the black substance that coated a stone ball from Herodium as ash. Following an exam carried by Prof. Stephen Weiner, of the Weizmann Institute I was able to associate this intentional coating with a literary description by Josephus (Stiebel 2003, 221, 223).

Re-enactment and ethno-archaeology

Relying on reconstruction or experimental archaeology has been compared, by Bishop and Coulston, with walking on thin ice. Attention is drawn to the limitation of the information gained from re-enactment societies and individuals, although they emphasise several instances, like the case of the laminated armour, in which the contribution of re-enactors was crucial for the understanding of its construction and employment (Bishop and Coulston 1993, 39-41; Bishop 2002, 15-16, 17, 43, 81-83, 95-96; Griffiths 2000). Instead, there are cases, mainly with the 'low-tech' equipment, for which the field of ethno-archaeological studies seems reliable and rather useful. Thus, for example, the construction and operation of the sling has changed little since Biblical days, through the classical period up to our times. Thus, comparing this data we have even gained a better understanding of enigmatic ancient references (below, p. 184ff). The study of an additional item that enjoys the contribution of modern examples is that of the horse's shoeing, mainly the organic devices that served as *solea spartea*. Local Arab stone cutting tools, which have a long tradition in Palestine, assisted us to decipher the question of the *ballista* balls' production (Stiebel 2003a, 220). When we came to evaluate the status function weapons, like daggers, had in local populations it is interesting to view the importance the carved dagger has in modern Yemen particularly in

light of the prominent place the *sica* had among rebels (pp. 113-114) and the personal decorative attention knives' scabbards were given (p. 121). This is also true with regard to the individual cresting designs discernable on arrowshafts that still exist among modern hunting societies in Africa and South America as well as among archers that compete in sport tournaments (Stiebel 2004b, 123-124).

(b) The documentary evidence

'History repeats itself, historians repeat each other' (Philip Guedalla)

Ancient historical writings

Considerable historical data is available for the scholar of the martial history of Roman Palestine. Claims were made that the very early Roman presence in Palestine (63BC) is reflected in the Qumran scroll (1QM – Yadin 1962; Shatzman 1996 – with bibliography), although as asserted already above, the Roman influence in the scroll appears to echo mid-2nd century BC historical contexts and weapons, which is exhibited by the archaeological repertoire as well (Stiebel 2004a). The most informative source is no doubt the writings of Flavius Josephus. Many historians and archaeologists have made the credibility of Josephus a favourite target of their sharp criticism (summary: Broshi 1982). However, as far as the *militaria* aspect is concerned, the 'incidental' nature of the information regarding military equipment that is interweaved in his account bypasses historiographical obstacles such as the 'Pro-Flavian *Tendenz*' of his work (Wheeler 1996, 255). Indeed, Josephus clearly had his own subjective perspective, motivation and agenda regarding the occurrences in the First Revolt. Moreover, he seemingly was well acquainted with the writings of past Greek military historians (Gichon 1995a, 113-114), and his use of terminology is apparently not always very meticulous (Appendix 2). Nonetheless, a critical reading of his accounts in light of the archaeological finds seems to rehabilitate, at least in part, his bad reputation (Masada: Stiebel and Netzer 2006; Gamala: Syon 2002). Despite the personal commitments of Josephus to his Flavian benefactors and the natural psychological desire to elucidate, even to himself the horrid results of the Jewish war, one should not underestimate the potential of the data that is embedded in the accounts, as is so often done. The fact that Josephus bore witness to the fighting through the eyes of both an enemy commander and a captive generates a rare glimpse into the occurrences of the revolt, particularly interesting to the study of 'side-themes' like *militaria* that suffer less from biases. Thus, a possible explanation for the discovery of an intentionally blackened stone ball from Herodium has been presented, linking it with a description that appears in the account of the siege of Jerusalem (Stiebel 2003a, 221, 223). An additional example is the identification of the unique iron shafted weapon found in a breach at the wall of Gamala as a *falx muralis* (**PL. III.3A: 1**). In the very same time the discussion of this tool, that is described by Josephus in his account of the battle of Jotapata (*BJ* 3.225),

clearly indicates that although the Jewish historian had a wide knowledge of Greek military history he was not an armchair historian (Stiebel 2005b, 102). The most interesting occurrence is the analysis of the panoply of L. Magus at Gamala in light of the available historical account (*ibid.*). The equipment of this legionary that was found buried under a stones-collapse appears to illuminate the fierce battle that raged at the site during the failed first Roman attack, the description of which was provided by Josephus in meticulous detail (above). A series of future comparative archaeological and historical studies that will focus on each of the siege-sites that are described by Josephus is very much needed; such studies of the sieges of Masada, Gamala and Jotapata are underway. It is clear that the archaeological data will contribute (and already does) to place Josephus testimony in its correct historical and social context, as well adding data and providing a critical tool for its comprehension. Apart from the writings of Josephus, a short but an important account by Cassius Dio concerns the First Revolt, most notably the siege of Jerusalem and the siege-equipment there used (Dio 66.4.4). Students of the Second Revolt lack a parallel literary source of the magnitude of Josephus. Cassius Dio is the sole source that provides information which is relevant to our study; i.e., the fact that Jews supplied weapons to the Romans and the method by which the rebels managed to accumulate weapons (*ibid.*, 69.12-15).

Reviewing in Part II the terminology used by Josephus to describe *militaria* (see: Appendix 2), as well as the martial vocabulary found in the rabbinical literature that is discussed next, it is apparent that a diverse number of sources has influenced the writers of the accounts and compositions that came down to us. This situation is not merely a reflection of different chronological episodes or a variety of ruling nations, but is also an echo of the geographical and cross-cultural position of Palestine.

Rabbinic literature

The Talmudic or rabbinic literature represents the life-works of generations of Sages, the religious discussions of which were compiled in several compositions (Appendix 4). Except for marginal references it is literally a *terra incognita* among the students of Roman *militaria*. On the other hand, only a handful of studies have explored weapons in the rabbinical sources, none of which critically incorporates archaeological data. The distinguished Talmudic scholar Krauss has assembled references from the Jewish sources to weapons, the literary discussion of which is largely outdated (Krauss 1948, 209-219). Several such references were further noted by Lundgreen and Klein (Lundgreen 1921 and Klein 1923; see also: Vilnay 1956, 171-173). Recently, Sperber has devoted three articles to the study of weapons from a Talmudist viewpoint: the sling (Sperber 1993, 156-162), shield (*apud* 1998) and trumpet (*apud* 1996), all appear to contain fundamental

inaccuracies (p. 75ff and 184ff).[7] Many aspects of Talmudic texts remain enigmatic and the complexity of this literature poses great difficulties for those who wish to effectively use the information embedded within. Fergus Millar writes that

> 'In spite of many attempts, a social and religious history based on the vast mass of rabbinic literature cannot yet be written, for the works themselves have not been studied in a way which would produce securely established texts, let alone a clear conception of the processes and dates of their composition, or of the handling of traditions within each work. Instead, we should use as a starting-point the quite extensive evidence we have from sources which are unquestionably contemporary, inscriptions and perishable documents above all... Any serious historical study must go *from* there to confront the complex mass of rabbinic material' (Millar 1993, 370).

This of course need not mean that one should leave aside the rabbinic literature as a source (Isaac 1992, 7-8). Discussing daily life events, the *Mishnah*, *Tosefta* and *Palestinian Talmud* reflect in many respects daily life in Palestine under Roman occupation, as 'Talmudic sources give a lively impression of the manner in which Roman army units carried out internal police duties among the Jewish population' (*ibid.*, 115). In part this is also true for the *Babylonian Talmud* and the *Midrash* that retain some rulings and proverbs based on old traditions that reflect grains of historical reality. An example of this are the Destruction Legends, which consist of a group of detailed descriptions of the occurrences of Jerusalem's destruction (AD70), which were integrated in the Talmudic literature (Git 55_b-57_a; *ADRN* A 4; *ADRN* B 6-7; PT Tann 4 68_c-69_c and T Tann 3.9-10).[8] As noted above, the advantage of the rabbinical sources lies in theirs outsider perspective, providing the point of view of the occupied population. AS noted above, Roman literature retains many examples of a bias against Eastern provinces and even eastern Roman units. Thus, when one reads in the Latin sources, for example, that 'some nations in ancient times led forth camels into battle... However, apart from its novelty when it is seen by those not used to it, it is ineffective in battle' (Veg. 3.23), it is important to be exposed to less biased sources like the rabbinic literature that reflects better this region from a local perspective and underestimate less its peoples. Although commonly presenting a more balanced reflection of events than that which emerges from the Roman sources, rabbinic literature also retained a biased approach towards the Romans, which is distinctive of occupied populations. Still, I find it to contain a wealth of technical details that are relevant to our study, data that is not influenced by the political or social

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[7] The trumpet and sling were discussed in the chapters that eventually were not included in the dissertation, but see below. An etymological study: Sperber 1975.
[8] *ADRN*: Kister 1993; *apud* 1998a, 1998b; Stiebel 2000.

orientation of the sages. Describing daily life under Roman occupation provides us with information concerning Roman and local panoplies in Judaea, as well as their production processes, evolution and use. The deciphering of the social environment, as it was presented above, much depended on this data. Moreover, not a few details concerning weapons which are scarcely noted in other sources are found there, like the wickerwork shield (p. 76ff). This kind of data provides another attitude towards the revealing of the wider picture or the jigsaw-puzzle of martial life in Roman Palestine. Not least important, the archaeological data that is presented here has as yet unrecognised importance for the understanding of many difficult rulings found in Talmudic sources, thus contributing to the field of Talmudic *realia* which has recently attracted scholarly attention. Another contribution of the rabbinical literature is being a source of terminology for the linguistic dimension that is reviewed below (pp. 208-211).

In the present study an attempt was made to utilise the scattered information of a technical nature regarding *militaria*, much of which remains unexploited or unexplored. As a significant number of references have proven to be very informative, revealing yet unrecognised details, it became evident from an early stage of this study that a thorough and critical accumulation of data and analysis is needed. As a result, a procedure of a rigorous comparison between the archaeological and historical data, and the rabbinic literature has been followed, which has contributed to the comprehending of several difficult issues. It sheds for example new light upon unclear references in the Classical literature (sling, see below), plainly manifesting the degree of influence of the Roman world had on the Jews despite the religious, and to a certain extant social idiosyncrasy. The rabbinical sources relate to martial life and material in varied ways. As far as equipment is concerned, I may roughly say that part of the accounts refer directly to *militaria*, while others reflect their social and symbolic function and place in the Jewish civil and Roman military societies. Initially, I may note the *halachot* that deal directly with the laws of war (Herr 1961, particularly pp. 355-356). Unique to the Jews were the rulings regarding the Sabbath (Saturday; above) that provides further details concerning the panoplies that were prohibited to be carried on that day. Yet, the most informative direct references to weapons are further found in the rulings concerning the purity of tools (*Kelim*), as according to the *Mishnah* all tools of war were considered impure (Kel 11.8). This group of rulings reflects a moral attitude of the Sages, but at the same time may be regarded as a society that by the mid-Roman period was rather accustomed to life and to identity preservation under Roman occupation.

Archaeo-talmud

These writings contain information that is relevant to most aspects of military life and the military-civil relations as well as a precise data concerning martial material culture which is

important on its own right.[9] Examples are known from nearly every aspect, ranging from the composition of the panoplies in Roman Palestine to remedies that were used in the veterinary treatment of equines that corroborate and add details to the data gathered by Hyland and Toynbee (Hyland 1990; Toynbee 1973, 321ff). In the 1st century the prohibition on bearing arms in public on Saturday, unless implied by necessity, was still prevailing (*Vita* 32.159). The *Mishnah* lists the types of weapons, thus actually granting us with the common weapons used in roman Palestine: *caligae*, armour, a helmet and greaves (Shab 6.2), as well as a sword, a bow, a shield, a club and a spear (Shab 6.4; *cf. Mech RsbY* 13.18). The military utensils included also the knife and baskets (*ADRN* A 40). Other rulings provide data concerning the *dolabra*, riding equipment and so forth. In order to demonstrate the potential of the technical aspects of the data that is embedded in these sources for the understanding and reconstruction of *militaria*, I wish to elaborate on one example that focuses on a somewhat neglected native weapon – the sling. Despite the rather prominent place of the sling among shepherds, *militia* forces and even institutionalised armies, we possess rather little knowledge concerning the exact construction of this 'primitive' type of weapon (Roman army: Griffiths 1989; Völling 1990).[10] The rabbinical sources contain discussion of two rare technical aspects of the sling, noting the existence of three different types of pouches in Roman Palestine: a woven pouch (Petrie 1917, Pl. 15: 14v), a pouch made of leather (*Vindolanda* IV, *fasc.* 1, 12, Fig. 1; Stephenson 1999, 86, Fig. 45; Griffiths and Carrick 1994, 9-10, Fig. 4; Göpfrich 1986, 5-6) and an enigmatic pouch that is made of strings, to the understanding of which the following discussion is dedicated.

'The sling whose pouch is [made] of strings'

In the *Tosefta* we read:

> 'The sling whose pouch is [made] of strings, Rabbi Dosa ben Harkinas pronounces it not susceptible to impurity, and the Sages says: If it has three [strings] it is susceptible to impurity, [but if it has] two [strings] it is not susceptible to impurity.
>
> [If] the central [string] is broken off it susceptible to impurity; [But if one of the] external [strings] is broken off it is not susceptible to impurity.
>
> If the fringed-hold is broken off [but] it is at least a handbreadth long it is susceptible to impurity' (TKel, BB 4.14).[11]

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[9] Many of the discussions that exhibit the importance of the *Talmudic* corpus, like military dress, badges and *signa*, riding equipment, military musical instruments, tents and production tools, were excluded from the final version of the thesis.

[10] Both rebels and Roman auxiliary forces employed the sling during the battles of the First Revolt (*AJ* 17.259; *BJ* 2.423; 3.162, 525; 4.27; 5.117, 174, 268, 548). Herodium (Stiebel 2003a, 218, 237-238, Figs. 2, 23-24); Masada (**PL. III.19V: 1**; Stiebel and Netzer 2006, 60; III.20/K).

[11] My translation.

The commentators found this ruling difficult, as reflected from David Pardo's words: '...but what was written: '[If] the central [string] is broken off' etc., is not mentioned there (Eduy 3.5) but I did not know what is external and what is meddle...' (Pardo 1994, 157).[12] Sperber interpreted this ruling as follows: 'it is a sling made entirely of strings, that is ropes of cloth straps; and it does not consist of a pouch of its own, but the crossing of the strings, or their joint at one end of the sling create a pouch' (Sperber 1993, 161).[13] Furthermore, Sperber presented a reconstruction of a sling (**Fig. 32: 1**), which is reported to have been tested by him (*ibid.*, 2). However, the assessment of the *halachic* text raises serious doubts concerning Sperber's interpretation. Let us examine the text. The pouch is made of strings. Interestingly, unlike the two other slings noted in the *Mishanh* which consists each of a pouch, a fringe-hold and a finger-hold this ruling notes only the fringed-hold. Therefore Sperber's reconstruction is not compatible with this data for it has a finger-hold and lacks a fringed-hold – contrary to the written in the *Tosefta*! Moreover, the concept that stands behind Sperber's reconstruction refers to a **sling** that is made of several strings. However, from the text it is clear that the string construction is not of the sling but that of its pouch alone!

In addition, a further difficulty with 'Sperber's sling' lies in the evident lack of stability of the sling in the reconstructed weapon. The construction of three strings that are joined at the base of the sling would have not held the shot firmly enough, which would have prevented a steady launch and consequently the lack of accuracy. Even his reconstruction of the detachment of the central string (**Fig. 32: 1b**) has no basis, for there is no way the two strings left would have been able to hold the shot at all. However, it is not enough rejecting Sperber's reconstruction for it is still our requirement to present an alternative interpretation. This is found in a painted relief and fresco that decorate two Etruscan tombs. The first evidence consists of a relief of two slings found upon a pillar in Tomba di Relievi (IT) (**Fig. 32: 2**). The slings are made of two plaited straps, the visible ends of which are equipped with a fringed-hold. But the most interesting feature is the pouch that is made of three strings; the straps were plaited from several wrap strings that were divided in the centre into three, hence forming a pouch that can be charged with a shot. This type of sling accords well with all the details mentioned in the text of the *Tosefta*. Firstly, it is made of three strings. Moreover, the Sages discussed two categories of strings: central and external. In a similar manner the Etruscan sling consists of a central and two external strings (**Fig. 33**). This evidence clarifies the ruling: 'If it has three [strings] it is susceptible to impurity, [but if it has] two [strings] it is not susceptible to impurity. [If] the central [string] is broken off it is susceptible to impurity; [But if one of the] external [strings] is broken off it is not susceptible to impurity'. The type of

[12] My translation.
[13] My translation.

pouch under discussion has three strings that embraced the pellet. Thereafter, the Sages discuss the circumstances under which one of the three strings broke off, pronouncing the sling not susceptible to impurity. However, this ruling had to be refined, for there were at least two possible scenarios. Should the central string broke off the slinger could have still charged the sling, although the pellet had to be of a larger calibre; in spite of the damage one could still employed the sling. An example of a two strings sling is depicted in a relief from Room XIV in the southwestern Palace of Sennacherib (Barnett, Bleibtreu and Turner 1998, Pl. 163).[14] However, if any one of the two external strings broke off the slingshot could not have settled in the pouch and would have fallen out, thus preventing the use of the sling and negating its being a receptacle.

Now let us examine the closing of the ruling. Indeed, only the existence of the fringed-hold is mentioned while that of the finger-hold is unnoticed. However, one should not necessarily conclude that the sling of the three-stringed pouch had one fringed-hold alone. In fact it had two such elements at the ends of both its straps! This formula is observable in modern Peruvian slings (Collingwood 1988). I believe the reason for this construction and the lack of the finger-hold lies in the type and more accurately in the calibre of the shot used. The three-string pouch only allowed the hurling of large shots, as a small pellet would have fall between the strings. The size of the shots clearly influenced their weight which would have not been on the lower scale (the question of the exact weight will be shortly discussed). As demonstrated above, in order to operate the sling, the looped strap's end was worn over one of the slinger's fingers. Should this was the case with the three-string sling, with its heavy ammunition, the well being of the finger would have been seriously endangered. A heavy shot, launched in the speed of near 100km/h could have resulted in the spraining of the finger if not a more serious injury. In order to avoid such a danger, both the straps of the sling with the stringed-pouch had fringed ends. This element allowed adequate holding of both the free strap, that were grasped between the thumb and index finger, and the grasped strap, which was grasped between the third finger and the ring finger or between the ring finger and the small finger; hence the proper launching procedure was ensured, as was the health of the slinger. The construction of this type clarifies why the ruling indicates only the fringed-hold element. Nevertheless, the Sages further discussed the ruling of a sling with a string-pouch that had lost its fringed-hold. The construction of this sling clarifies why only the finger-hold element was noted in the *Tosefta*. The Sages further examined a case in which the string-pouch is intact while its fringed hold is missing. The consequence of losing its fringed-hold element, in the case of this sling, its two fringed-holds, was the destabilisation of the sling's

[14] An Inca example was found in a tomb in the Andes (*National Geographic* 196 (1999), 52). Modern slings of two strings pouch are documented in South America as well as in the Balearic Islands (Griffiths and Carrick 1994, 5-6).

employment. This prevention was supposed to purify the sling. However, the Sages further asserted that in the case that at least a handbreadth remained from the fringed-hold it is susceptible to impurity; for the sling still may be regarded as a weapon.

Three more slings, with stringed pouches, were painted on the back wall of Tomba Giglioli in Tarquinia (IT) contemporary to the above noted tomb (Steingraeber 1986, 309). Even though the Etruscan artist did not bother to paint the very particulars of the sling, the plaiting construction of the sling is noticeable. Interestingly, apart from the *halachic* account and the artistic representations, we posses an early account by Livy

> 'The bullet carrier, strengthened with numerous seams, is triple that the missile may not fly out at random, from the pliancy of the strap (*scutale*) at the moment of discharge, but, seated firmly while being whirled may be shot out as if from a bow string' (38.29.8).

Following the translators of the Loeb edition Griffiths referred to this paragraph as follows: 'it may be that Livy does not entirely understand what he is describing' (Griffiths 1989, 256). However, in light of the three-string pouch noted in the *Tosefta* and the representational evidences from the Etruscan tombs it is clear that Livy knew very well what he was describing! The fact that two sources describe the same object is proven by the fact that both note the triple-string pouch. The Roman historian also mentioned the advantage of this construction, that the shot was set firmly in the stringed pouch. His description provided an interesting technical detail, which is the use of strings to strengthen the pouch. Such elements are clearly discernable on the relief from the Tomba di Relievi, where they are located in the joining parts between the straps and pouch (**Fig. 33**). These were the weak points of the sling, as they suffered the greatest pressure during launching. A fine example of such a failure is the 8th century BC Egyptian sling that lost an entire strap (Petrie 1917, Pl. 15: 14v).

The last Etruscan relief retains an additional technical detail of a knot-like thickening that is placed half way up the strap, the meaning of which is not entirely clear to me. However, apart from the simple explanation that it is merely a decorative feature, this thickening might have had a functional reasoning behind it. In addition to the common long-range targets, the ancient slinger was fighting also at close-range in battles and in sieges where he shot at close-range targets. Hence, it was important to be able to deal with a diversity of ranges and the slinger and his weapon was required to be highly versatile. The Balearic warriors over came this challenge by employing three slings – long-range (*μακρόχωλος*), medium-range (*μέση*) and short-range (*βραχύχωλος*) slings, the three differing in the length of their straps (Strabo *Geog.* 3.5.1 and Diodorus 5.18.3-4; *cf.* Flor.

Hist., 1.43.5[15]). If the above noted element is not decorative in nature, the thickening of the sling's straps may represent a more 'economical' solution for the question of the variety of ranges; that is to say that it was used as a holding point – a sort of a variation of the fringed-hold. Thus, when the slinger wished to shoot at a long-range target he used the entire length of the strap, while against close targets the strap was shortened by holding the thickenings located upon the straps, granting the individual slinger with a wider spectrum of ranges. A supporting hint is found in the Assyrian battle reliefs, which depict a strap that hangs down from the hands of Sennacherib's slingers (Ussishkin 1982, Figs. 75-76). Indeed, a closer examination of the relief from Room XIV of the southwestern Palace at Nineveh indicates the existence of this element (Barnett, Bleibtreu and Turner 1998, Pl. 163 – left sling). The fact that all four slingers hold the strap at different points may not be coincidental and aims to represent a conscious choice of the artist in order to describe the varied optional sling employment, for a variety of ranges.[16] In any event, the sling of the three-string pouch was a known type in the Classical world, at least as early as the late 4th century BC – early 3rd century BC. The special construction of the pouch, the strengthening effort and the use of two fringed-holds indicate that the sling was used for the hurling of particularly large shots.

Funda librilia

The Romans had few words that designated the sling. The most common was the *funda*, next to which we have the somewhat rarer reference to the sling as *librilia* (Cheesman 1914, 132). Tacitus noted the *librilia*, like the *glandis* as a separate noun from the *funda* (Tacitus, *Annals* 13.39, 2.20). Caesar mentioned that '*fundibus librilbus... ac glandibus*' participated in the fighting at Gaul (*BG* 7.81.4). His forces included slings that hurled leaden pellets (*glandis*) as well as a type of ammunition that is termed: *librilis*. Since *librilis* means 'weighing a *libra*' (1-*libra* = 327.45gr), we should regard the *funda librilia* as a weapon that launched 1-*libra* heavy shots. Yet, Pritchett referred to this weapon: 'I conjecture that originally, to throw heavier stones, a different kind of sling was devised' (Pritchett 1991, 33). He asserted that the *funda librilia* differed from the hand-sling. His notion is based upon the words of the 8th century AD writer Paulus Diaconus who refers to *librilia* as a weapon that consisted of a stone that was hurled by an attached strap – in a similar manner to the modern hammer that is thrown in sport competition (*Festus* 116 M). As a matter of fact Pritchett suggests that the weapon employed by Caesar's forces was in the image of the modern hammer. However, there is a problem using such a late testimony to interpret a term that was

[15] Rossbach's ed. = Florus 3.8.

[16] Alternatively, we may explain this feature as the remainder end of one strap rather than two, the intention of which was to create an intentional difference in the straps' lengths. A modern Korean sling exhibits such a construction (Lindblom 1940, 36), in which the grasped strap was shorter than the freed strap which assisted in the shooting and aiming.

used some eight hundred years earlier. Moreover, we should emphasise that no supporting literary or artistic evidence attests the use of such a weapon in the late republic-early Principate period. Hence, there should be no dispute that the name of the sling indicates the exceptionally heavy ammunition. However, if we wish to elucidate the image of the *funda librilia* one should not necessarily search for a different type of sling (with a different launching technique) but rather seek for a sling – and more accurately a pouch – which was capable of launching heavy shots. The answer is found in the pouch of three-strings that is neatly adapted to this requirement. The open structure of the pouch could have been used for large shots only. As aforesaid the use of two fringed-holds testifies for the heavy weight of the shots. It appears that the only sling that could have contains large shots – around 1 Roman *libra* – was the hand-sling with the stringed pouch. Such a weapon was employed in the 4th-3rd century BC (Etruscans) at least as late as the 2nd-3rd century AD, the time of the compiling of the *Tosefta*. Modern Peruvian slings still exhibit this construction (Bill Griffiths, *pers. comm.*).

However, the question that raises is whether we possess archaeological evidence for shots that weigh 1 Roman *libra*? The upper range of the slingshot's weight was estimated around 250gr (Densem 1976, after Holley 1994, 355). Korfmann demonstrated that the average weight of the stone and clay shots was between 20 and 50gr, the range of which was 13-185gr (Korfmann 1973, 39; Pritchett 1991, 2). According to Zangemeister the weight of the shots from Sicily and Italy during the Roman period was: 24-46gr in Sicily and at Asculum the average weight was 47gr. However, the inventory from Palestine, particularly in the Roman period, indicates that the upper limit of the shots' weight should be broadened. Several chapters in Vitruvius' account retain rich information concerning the construction and the operation technique of the varied artillery machinery. One of the more intriguing details is a list of the varied machines according to the weights of the *ballista* balls, commencing with 'a *ballista* intended to throw a two-pound stone...' (Vitr. 10.11.3).[17] As the Roman pound was identical to the *libra* the minimal weight of the *ballista* was, according to Vitruvius, equal to 655gr. Indeed the lowest weight of artillery ammunition found at Masada was 600-700gr (Holly 1994, Appendix B). However, at both Herodium and Bethther stone balls that weigh above 250gr and under 600gr in contexts of the two Jewish revolts were found. There is a sort of twilight zone that has not yet been dealt with in the study of shots, which were clearly not the ammunition of light artillery machines and on the other hand their weight crossed the alleged upper limit of slingshots: 250gr. Indeed, the data of balls that falls within this category from Palestine indicates that not a few balls cluster around the weight of 1-*libra*. This is true as for the finds at Machaerus (Vardaman 1969, 20)[18], seven stone shots from the First Wall in

[17] Marsden 1969; 1971; Shatzman 1989.
[18] Vardaman mentions shots that weigh 0.65 pound.

Jerusalem (Shatzman 1989, 473) and two shots from the survey of Legio: 313.96gr and 312.45gr.[19] Recently I have traced additional stone shot from Masada (L1180; B2271), with the diameter of 57-60mm and the weight of 250.30gr. The historical sources clearly point out that such shots were hurled from hand-slings in the 4th century BC. Describing the battle that took place in 311BC and the bank of the river Himeras in north Sicily between the people of Carthage and Agathokles, Diodorus notes the vital role of the Balearic slingers:

> 'By hurling a shower of great stones, they wounded many and killed not a few of those who were attacking, and they shattered the defensive armour of most of them. For these men, who are accustomed to sling stones weighing a *mna* (*μναιαίους λίθους*) contribute a great deal towards victory in battle, since from childhood they practice constantly with the sling. In this way they drove the Greeks from the camp and defeated them' (Diod. *Hist.* 19.109.1-2).

The weights of the shots were 1-*mna* (341.1-436.36gr)[20], indicating that the measure of 1 Roman *libra* did fall in the range of weights that were apt for slingshots.[21] Interestingly, a stone ball from the site of Caerleon (UK) exhibits the incised letter M (*RIB* Vol. II, Fasc. 4, 103, No. 2451.1). Today the weight of the stone is 326gr and it is reported to be slightly chipped; hence originally it was slightly heavier (*ibid.*). As the weight of this shot fits into the range of the *mna*, may the inscription from Caerleon mark the weight of 1-*mna*? It is likely that the shot was not intended for torsion artillery machinery (*ibid.*), but rather as a slingshot (possibly the *funda librilia*).

Additional supporting evidence for the use of such heavy pellets is hinted at by Vegetius. Describing the recruits' training, he mentions stone-throwing drill, and the weight of the stones was that of 1-*libra* (Veg. 1.16).[22] If the warriors were capable of throwing stones of such a weight by hand, there is no doubt that with the aid of the right sling one could have easily hurled similar shots.[23] Indeed, in the course of the fighting near Palmyra around 400AD such a sling was employed: 'they were set upon by slingers firing rocks as big as a fist or even

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[19] The average weight of shots from el-Khirbe (11 century BC) is 400gr (Hizmi 2003).

[20] The Attic *mna* was equivalent during the Roman period to 341.1gr, where as the ancient Attic *mna* was 436.6gr (Hultsch 1882, 42ff.). There is no reason not to assume that the standard was that of the Ancient Attic *mna* (Marsden 1969, xviii). Supporting evidence to this notion may be found in the stone weight from Herod's time that bears the mark: '3 *mna*' and its weight is 1233gr (Meshorer 1970). Thus, 1 *mna* = 411gr, which is rather close to the measure of the ancient Attic *mna*.

[21] Italian *mna* in the Talmudic sources – 358.5gr (Albeck 1952, Shebi 1.2-3).

[22] *Saxorum manualium*. Also: Amm. 24.2.14; Livy 38.21.6.; Arrian *Epict. diss.* 25; Veg. 1.16, 2.23. A depiction of such training is found on the tombstone of a Roman soldier (Speidel 1994, Pl. 14). For modern exercises: Griffiths 1992. 4th century BC representation: Schneider-Herrmann 1996, 81: Id, Pl. 11. Stone throwers: Pritchett 1991, 65-67; Baatz 1983, 136-140.

[23] It should be noted that among the stone shots that were found in Iron Age Lachish (a period in which the technology of torsion artillery was clearly unknown), the weights of part of which fall between 250-350gr. I thank Prof. Ussishkin for this unpublished data.

bigger (it was easy to shoot bigger stones from the higher ground)' (Zos. 5.16). Xenophon uses the same measure in his account of the effectiveness of the Rhodian slingers against the Persians slingers, which: 'have only a short range because the stones that are used in them are as large as the hand can hold' (Xen. *Anab.* 3.3.17). A modern report from New Guinea refers to the launching of shots, the size of billiard balls, to the distance of 180m (Wheeler 1943, 49). In light of the above it appears that the shots from Bethther, Herodium and Legio should be identified as slingshots rather than balls for a torsion artillery machine. Livy's description of the three-string pouch, with its special adjustment for heavy shots, indicates that it was the most likely candidate to be identified with the *funda librilia*. It may be that Josephus refers to these slingers, writing about the *πρὸς δὲ τοὺς ῥωμαλεωτάτους σφενδονήτας* that operated from the tops of the Roman siege-towers at Jotapata (*BJ* 3.285). Additional example derives from the world of dress and riding equipment.

Knee-breeches

On Trajan's Column three cavalrymen are depicted wearing knee-breeches (scene XXIX). According to Coulston 'the garment was necessary to protect the horseman's inner thighs from chafing against the saddlery' (Coulston 1988c, 250). The leather *bracae* also provided better gripping, in particular while riding a sweating mount (Hyland 1992, 117 and below). Standard bearers, musicians, officers and auxiliaries are further depicted on Trajan's Column to wear the *feminalia* (Coulston 1988c, 220, 239). Such a dress item is commonly depicted in the funerary art, for example, on the late Flavian relief from tombstone of T. Flavius Bassus (Schleiermacher 1984, Nr. 18). An informative testimony of the Late Roman cavalry breeches is found in the *Babylonian Talmud*

> 'to what were the breeches of the *cohanim* (priests) like? They were like the *feminalia* (knee-breeches) of horsemen (פרשים)[24], reaching upwards to the waist and downwards to the thighs. They also have laces, and do not have no 'house of anus' and no 'house of loins'' (Nid 13_b).

The dress item was clearly a knee-breeches, extending from the waist to the thigh, with decorated laces, presumably along its lower hem.[25] Worth noting is the fact that the breeches were open along the crotch, lacking both the cover for the loins and hind part. This description accords well with the modern cowboy leather breeches that are worn to avoid the chafing of the rider's thighs with the skin of the horse and protect his calves from the sweat of the horse, which could imperil his stability (Toynbee 1973, 338).

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[24] Rashi reads *prushim* (Pharisees) rather than *parashim* (cavalrymen), but the absence of the vowel *vav* negates this interpretation.
[25] On the *feminalia* (פמלניא): Krauss 1945, 215.

Given the preliminary stage of the study of *militaria* in Roman Palestine, it is clear that a comprehensive comparative study of military Talmudic *realia* in light of the martial material culture is a task for the future. I believe the above examples demonstrate the potential of this integrative approach.

The War Scroll

Scroll 1QM, that it is little known among scholars of Hellenistic and early Roman weapons, retains detailed descriptions of weaponry, military organization and fighting tactics, all of which were entirely or at least partly linked with the Romans (Yadin 1962; *contra*: Avi-Yonah 1952; an integrated approach: Shatzman 1996). The reader would have expected to find the data embedded in the extremely important document incorporated in this thesis. However, a study of mine demonstrated that many details and previous concepts need to be reconsidered and altered, as the tradition that emerges from the text and the archaeological finds is evidently Hellenistic, partly reflecting the reform of the 160's BC (Stiebel 2004a).

Epigraphy

The last written source to be considered is epigraphy. MacMullen illustrated the evolution of the Romans' 'obsession' for writing (MacMullen 1982). The discovery of Latin inscriptions in Roman Palestine should be primarily associated with either the Roman government or the Roman army (Hannah Cotton, *pers. comm.*). As mentioned above, Jews regarded Latin as the language of battle. Latin inscriptions were found on mile-stones, dedication inscriptions and documents that are related directly to the Roman military administration (correspondences and diplomas), as well as on everyday utensils. To the initial category I attribute the pay record from Masada which directly associates martial material culture with individual soldiers and units (*P. Mas.* 722), which contains important details concerning military dress items and their costs. The latter category commonly consists of the names of the owner, his unit or the maker. Only a few important inscriptions have been found on *militaria* in Roman Palestine. Three *tabulae ansatae* from Gamala bear the names of Roman soldiers and their unit affiliation (**Pls. III.3Y: 2-4; III.3Z: 1**). They were apparently used as ownership tags, which were fastened on both sides of the boss (p. 93ff). To this rare group I add an inscribed belt mount from Gamala (**PL. III.3AG: 6**). In addition one may refer to military bread-stamps (Stiebel 1999, 72-74) or brooches (*AVCISSA*).[26] Lastly, *militaria* was used as a platform for political or religious propaganda. A leaden slingshot appears to carry the name of Mark Antony (*apud* 1997). This function played an important role in the psychology of war and contributed to the morale of the individual soldier and the unit's cohesion.

[26] Found at Masada and Gamala (*pers. observ.*).

(c) The representational evidence

The definition of Jewish art, particularly in ancient times, is rather elusive and this much debated subject clearly draws beyond the scope of my study. However, this definition depended heavily on the time and place in which it was executed. These restrictions derive from the book of Exodus, according to which Jews were forbidden to 'make unto thee a graven image, nor any manner of likeness, of any thing that is in heaven above, or that is in the earth beneath, or that is in the water under the earth' (Ex 20.4). The interpretations of this commandment differed throughout history. Nonetheless, in early Roman Judaea we find symbolic representation of martial-associated themes upon coins, oil-lamps and ossuaries as well as human figures of warriors that were executed in rather a primitive style by local Jews.

As far as Roman art is concerned, the innovative approach of Robinson's work that relied heavily on archaeological rather than representational materials, paved the way for the critical study of Roman *militaria*. The development of the field in recent decades indicated the abandonment of popular monuments like Trajan's Column that for years served as the sole source for arguments about the nature of *militaria*. The representations of Imperial propaganda and ritual representations of gods and goddesses carrying arms were proven to be anachronistic and conservative in nature and in many instances erroneous (**Fig. 7**). Nonetheless, despite these reservations there are not a few details that clearly faithfully reflect the equipment on the Column (below; Coulston 1988c). Expression of personal propaganda like tombstones commonly suffered from a less elaborate level of craftsmanship. However, James has recently demonstrated the potential of personal expressions in images of charcoal graffiti and incisions (James 2004, 39ff; below). The paragraphs below consist only of the most relevant and informative pictorial sources.

Coinage and oil-lamps

The coinage of both Hellenistic and Roman Palestine exhibits schematic descriptions of weapons. In the early Roman period representations of helmets, shields and spears are commonly found. However, in many cases these depictions are useless for our study being symbolic and anachronistic in design. Furthermore, the small dimensions of the coins as well as the limitation of manufacture techniques precluded this medium from being a dependable source. Nonetheless, my study indicates that there are few important exceptions. The coins of King Herod the Great and his son Herod Archelaus exhibit helmet fittings that appear not only to be genuine but to point at the possible origin of the equipment (p. 20ff; Stiebel 2003a, 215-216).

Interestingly, the highly decorated 'South oil-lamps' (dated to the inter-revolts period), which exhibit very accurate images of domestic tools (Sussman 1972), do not manifest even a single depiction of a weapon, apart from the ritual double axe and the *pelta* shield (**Fig. 15:**

5). The potential of this medium is demonstrated by a local 3-5th century AD oil lamp that clearly depicts a horned saddle (Israeli and Avida 1988, Pl. LIII: 306).

Sculptures and reliefs

The little evidence of sculpted material serving imperial propaganda from Palestine is irrelevant to our study.[27] However, as mentioned above the critical approach to the reliability of Trajan's Column, and like monuments, following Robinson's work (Robinson 1975, 182-184), should not lead to an uncritical rejection of the testimony of imperial propaganda. Although the representation of warriors and their equipment is anachronistic at times, too general or stereotypic in others or even completely erroneous, some elements do reflect an intimate acquaintance of the artist with the *militaria*. One such example is the sword handguards of the Roman riders in scene xxxvii (**Fig. 18: 2**) that are decorated by a V-shaped element. The latter appears indeed to be typical of Roman *spathae* (pp. 116-117). Somewhat similar to a literary ancient historical source, one must be critical in his acceptance of the data, but in the same time equally cautious with its rejection. The degree of the diffusion of roman military design into Judaea is exemplified by the depiction of a *gladius* with a ribbed handle that is found on an ossuary from Bet Zayyit (**Fig. 17: 1**), an artefact that was uniquely used by the local Jewish population alone.

Figurines

Figurines and statuettes are commonly associated with ritual activities. The representations of *militaria* on these miniature objects were standardised and reflects conservative and anachronistic designs and motifs. A rare exception is the very realistic Moorish figurine that was found in the boundaries of *legio X Fretensis*'s camp in Jerusalem (Stiebel 1997; *apud*, 80-81). In addition, Nabataean camel figurines retain informative details concerning the saddles, harness, shields and edged weapons that equipped the Arabs (pp. 83-84, 114; **Fig. 18: 1**).

Drawings

An additional medium of representation are the incisions and charcoal drawings of military figures and equipment found on plastered walls (James 2004, 39ff). Indeed, being drawn by laypersons the result generally suffers from a low level of artistic technique like the gladiators' depictions from Tel Eitun (**Fig. 12: 2**). However, at times this evidence bears the advantage of being less propagandistic in nature, hence more reliable. The depiction of a warrior being equipped with a small round shield and a long spear that was found at Khirbet as Salantah (**PL. V.32A: 2**) appears to be the only realistic representation of a rebel from the Second Revolt, which is supported by the artefactual evidence.

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[27] See: **Pls. V.3B**; **V.2: 1-3**; **IV.4: 2**; **Fig. 17: 2**; **IV.4A: 1**.

Summing up, although some sources like the representational evidence are less reliable than others, an integrative approach appears to allow us to bridge over gaps in knowledge and overcome both ancient and modern biases in an attempt to reconstruct the martial material culture. Despite discussing a field that had been way to often ignored or regarded, at best, as 'small' or 'minor finds', present students of *militaria* are blessed by a wealth of sources that allows not only to reconstruct ancient arsenals but also to draw beyond the narrow typological aspect. If I have hitherto employed an introspective approach for the study of *militaria*, the next chapter turns to examine the contribution of military equipment to wider fields of social nature, like identity and symbolism, of the Roman east.

6. Identity, design, change and symbolism

In addition to studying *militaria* on its own right, military equipment has proven to be a valuable medium that reflects social aspects of soldiership and not least of the societies in which the military bodies operated (Coulston and Bishop 1993, 196ff; James 2004, 4ff, 260ff). From the many definitions given to soldiership, I have chosen to follow the following:

> 'Soldiership means to be a soldier, a human being in uniform in the armed forces. Soldiership is a composition of many aspects like skills, physical fitness and cognitive capacities, values, and identities, as well as organizational and technological environments and the prevailing cultural, social, and political views in society. The physical, mental and social contexts of soldiership do not only mean those of battles, wars or peace operations. They are very much also those of societies, nations and the globalizing world' (Toiskallio 2004, 1).

Although this work is archaeologically based, following the examination of *militaria* in its diverse archaeological contexts, most notably that of the field of conflict, it is worth-while reviewing the specific political, social and linguistic contexts, or environments, in which martial equipment was manufactured, used and referred to, both materially and symbolically, in early Roman Judaea. The second part of the chapter attempts to discuss both the collective physical aspects of martial material culture as well as the 'metaphysical' aspects of weapons. It initially presents reconstructed descriptions of the images of the warriors of early Roman Palestine base on a synthesis of the data gathered in Part II and the catalogue. I thereafter turn to examine the evolution or change in weapons during the early Roman period in Palestine and the diverse sources of influence that nourished this process in light of the question of the unity and diversity of the Empire. The theme of identity is interwoven throughout this discussion. Military equipment defined soldiers, or in the words of the *Mishnah* weapons were ornaments[1] to men (Shab 6.4). One of the most informative features of military identity is the symbolic aspect of martial material culture that ranges from status indicators to ritual functions of *militaria* to the analysis of which the closing part of the chapter is dedicated. Defining the soldier as an individual and as a member of a community the symbolic functions of weapons appear to further emphasise on the important place military life had among the peoples in which these military societies existed and operated.

(i) The social context

(a) The political environment

[1] Lit. jewellery.

Beyond the establishment of the nature of military equipment, the present work can be seen as a chronicle of a struggle, which serves as a reflection of the societies involved. The period under discussion included turbulent political upheavals, which apparently formed some of the most dramatic events that shaped the futures of this region and the Jewish nation to this day. In just under 200 years, the political status of Judaea gradually shifted from an independent kingdom to a client monarchy, which was later annexed into the Roman Empire. Following several decades of unrest it experienced two major revolts, finally deteriorating to the unprecedented status of identity elimination, when the name of the province was changed, to *Syria Palestina* (Millar 1994, Ch. 10). During this period, the country experienced the destruction of its traditional capital and its religious and civil ruling classes lost their power and authority. The destruction of the Temple had tremendous consequences, undermining national links both to land and place (as well as to the heavens). This shift, which was at the same time a shift of state of mind, necessitated the formation of a new ideology and social organisation in order to ensure continuity of national existence. This succeeded, as seven decades after the suppression of the First Revolt, the fire of nationalistic aspirations was still burning. Indeed, it seems to me that the gradual nature of these processes and the time these changes lasted, rather than a single swift conquest, allowed the endurance and development of anti-Roman spirits.

The pendulum motion of the political processes in Judaea should be seen against the background of wider events. The early years of the second half of the 1st century BC were directly influenced by the Roman expansion eastwards, most notably the clashes with the Parthians (pp. 216-217). Following the establishment of their grip in the region, initially through client monarchs, the Roman presence in the Near East from the early Principate was described as an occupation army (below), but not least as a force being deployed ready for further advance rather than for defence (Isaac 1992a, 52-53; Chapter V). Furthermore, the internal Roman political struggle throughout the early Roman period had its impact on Judaea. Most of Herod's reign enjoyed the stabilisation that characterised Augustus' days (*pax Romana*), whereas the First Jewish Revolt erupted during a period of a civil conflict in Rome that climaxed in the 'Year of the Four Emperors' (AD69). Under the Flavians hostility between Jews and Romans was kept 'on the backburner' for some four decades. It intensified during Trajan's reign to a local conflict (Qitos) that was followed by a revolt in the Diaspora (AD115-117) and peaked in the Bar-Kochba revolt (AD132-135). These events represent the interface or dispute points which were the direct causes for the use of weapons and resulted in the deposition of most of the equipment here presented. However, the political viewpoint provides merely part of the framework, namely the superficial level. From the political turmoil let us turn to discuss the social environment. The understanding of some of the processes that generated and nourished the subsurface Jewish resistance may gain from a

consideration of the social portraits of the varied parties and their interactions, for which military equipment can be used as a sort of a litmus paper.

(b) The social environment

In the social landscape of the Roman Empire, the Jewish people formed a society with unique, even exotic, national characteristics. Jews were prohibited to carry weapons on the day of Sabbath (Shab 6.4, 11.8); hence in early periods they were known not to fight during that day even in the face of grave danger.[2] This prohibition lies in the more fundamental debate that took place between Jewish Sages, concerning the characteristics of the weapons. Most of the Sages regarded them as nothing but tools of destruction (Herr 1961, 356 and note 5), echoing an apparent moral and educational position. Entering a religious study-house it was accustomed for the warrior to remove the head of a shafted weapon and to put it in one's legging (*fascia* = פסיקיא) (PT Sanh 10 28d; Croom 2000, 91), or money purse/bundle (אונקלי = *unkli*) (Sanh 82_a; *Lehn.* II, 23). Others, like R. Eliezer, considered weapons as a man's jewellery (Shab 6.4). The latter notion stems from a more practical perception of daily life, clearly indicating the ordinariness of carrying weapons in Roman Palestine. This standpoint appears to accord well with the conceptualisation of the Roman soldier who invested much in a shiny and jingly appearance and regarded them as status symbols (Coulston 1998a, 183-184; p. 231ff). Being monotheistic and holding strict idiosyncratic views Jews might have appeared in bystander's eyes as arrogantly secluded, regarding the world as 'us and them' (Balsdon 1979, 235-236; Rajak 1992, 9ff). They practiced dietary taboos, circumcision and did not fight during the Sabbath. In practice, this social seclusion reduced many aspects of interaction between Jews and Romans.

By stating this, I am not suggesting that no cultural negotiations and interfaces were in existence. We do see, for example, clear linguistic diffusion of Latin into Hebrew, examples of which are incorporated in Part II (Appendix 3). Adoptions of 'Roman' designs and symbols are apparent in all fields of material culture and life in Roman Judaea, like dress, leisure time, architecture, and of course military equipment. Nonetheless, the picture was far more complex and none of this new consumer-like attitude, being blinded by the dazzling wealth of designs and possible new relations and opportunities provided by the contact with the Empire, represents a wish of the Jewish population to adopt Roman identity (*cf.* Freeman 1993, 443; for culture's consumption – Hingley 2005, 105ff). From a Roman perspective, it is clear that the exploitation and enslavement of marginal societies were very much on the imperial agenda (*ibid.*, 120). Still, one must take into account that this was not an entirely asymmetrical relationship and that Roman conduct passed with no reaction from the native peoples. There are clear indications for the existence of an opposition, both active and

[2] Stern 1972, 76; *AJ* 14.225-230, 231-232. Balsdon 1979, 232-234; *contra*: Schoenfeld 2006.

passive. The former was reviewed in detail in Chapter 1, consisting of a chain of clashes and revolts. In the East, the political opposition that was manifested in internal unrest is exemplified by the frequency of banditry (Isaac 1992a, Ch. II). Of special interest are the subsurface manifestations, most of which are drawn from literary evidence. It is evident that in Judaea there were inherent social restrictions on relations with the Romans. One of the most clear examples is the Jewish ban over selling not only weapons but any item that could have been used against them, like mounts (p. 221; but, *cf.* Dio 69.12.2). Although this act may be interpreted as an expression of economic opposition, the clear literary context of safety considerations indicates that the chief rationale had more to do with self-preservation of the native people than with resistance to contemporary Roman cultural domination.

These observations express the value of rabbinic sources that uniquely reflects the native population's subsurface resistance, by discussing daily-life issues that were directly influenced by relations with the Roman authorities. They apparently provide a rare literary testimony of a subjected people, challenging the attitude of many modern scholars that has attributed such cultural expression to the 'colonizer'-side alone (Johnson 1999). Recent archaeometallurgical studies may suggest materialistic expressions for the secluded Jewish copper-alloy production that differed from the Roman tradition on a socio-religious basis (p. 244). Ironically, it was the Romans that contributed much to the growing distancing process by exempting Jews from military recruitment (Applebaum 1971, 181 and notes 2-3).[3] These circumstances contributed to the mutual alienation between the Roman government and Jews within Judaea and not least to the increase in tension that typified the relations between Jews and local Pagan populations, members of which served as Roman *milites*, in the decades preceding the eruption of the First Revolt (Yankelevitch 1979-1980). The fact that Jewish women were not allowed to get involved with gentile males further added to this distancing process (the marriage of Roman soldiers: Phang 2001). The answer to the question of whether the secluded Jewish approach dramatically influenced the degree of interaction with its neighbours and Romans, may lie in the eye of the beholder. In conclusion, it definitely slowed down the rate of the seemingly inevitable process of interaction, in comparison with other provinces.

The 'unfriendly interface'[4] nonetheless took place between the military societies of these two peoples. The social environments in which Jewish warriors and the contemporary Roman soldiers have operated were utterly different, functioning in totally different cognitive spheres. Despite the very diverse ethnic composition of the Roman army, its soldiers managed to form and maintain a surprisingly unified soldierly identity – a community of 'fellow soldiers' (*commilitones*) (James 1999), or 'collective mentalities' (Le Bohec 1994, 235-236;

[3] Although Jews were part of Herod's army (Mor 1986, 578; Roth 2004).
[4] Adopted from David Nicolle's article title: 'Medieval Warfare: The unfriendly interface', *The Journal of Military History* 63 (1999), 579-600.

cf. MacMullen 1984; Haynes 1999). Military equipment was one of the elements that distinguished soldiers, creating both individual and unit identity-senses within the army and in the eyes of non-military people. In addition to the panoply per-se, one may further mention soldierly dress items, badges (VI.3/S.1), harness equipment (III.3/Q.6-14; III.7/Q.1; III.15/Q.1; III.17/Q.2; III.19/Q.2-9, 12-13; III.20/Q.1-3; V.3/Q.1-4; VI.1;Q.2), the use of religious objects (III.19/T.1-2; ; V.6/T.1; V.12/T.1; V.24/T.1; III.15/T.1; III.3/F.1) and linguistic aspects that manifested and materialised this communal sense (Coulston 1988; James 2004, 261ff; below). This social bonding that formed an important factor in the consolidation of the Empire in peace time, also contributed much to the *esprit de corps* in war (Goldsworthy 1996, 252ff). The varied conflict lands that are discussed below, presented the Romans, both as individuals and as a military society, with a physical and emotional rollercoaster. In addition to the inconvenient logistic and weather conditions, they were faced with fatigue and demoralisation, coping with fears of possible injury, mutilation and death in battle (Jerusalem: Goldsworthy 1999). Nonetheless, throughout the Early Roman period in Palestine, the Roman army did not operate under an existential threat. Apart from a few surprises, namely the opening phases of both Jewish revolts, it did not lose control and one may generally stress that the army was setting the tone in the conflict land. We may regard the eruption of the First Revolt as a turning point in the attitude of the Roman government and consequently the army to the province. The force that garrisoned Judaea prior to AD66 comprised of auxiliary units, part of which were recruited from the pagan populations of Judaea, a direct implication of which indicates them as a party with an interest (*cf. BJ* 5.551ff). This was clearly part of the reason for the radical change in the composition of the Roman garrison that was ordered by Titus in AD70, according to which these units were replaced by the less personally involved of the members of the *legio X Fretensis* to which was later added the *VI Ferrata*.

The rebels' force was comprised of numerous ad-hoc organised fighting parties, a fact that clearly reduced its potential effectiveness (*ibid.*, 3.13ff). The members were raised from varied social strata of the Jewish population, including outlaws, freed slaves, plebs and normal members of the populace (*ibid.*, 4.508, 510), deriving from different ideological backgrounds (Sadducees, Pharisees, Zealots, followers of the 'fourth philosophy', *Sicarii*, Essaeans, etc.) and ethnic origins (Idumaeans, Samaritans and Jews from the Diaspora). Despite desperate efforts to properly organise the rebels 'after the Roman manner' and introduce them to 'the good order of the Romans' (*ibid.*, 2.575-584), these indigenous forces were far less well trained, both as individuals and as fighting bodies, and they were left to rely on numbers and mainly on their zealous fighting spirit (*ibid.*, 2.517; 5.121, 306). The classic pattern of ideological differentiations that tears resistance groups apart from within is applicable here, most notably towards and during the siege of Jerusalem (AD70). In addition

to the immense internal pressures, consisting of individuals that were all occupied subjects, the Jewish resistance acted under ever growing Roman pressure. Following the failure of the revolts against the Romans and the total loss of independence, intentional seclusion was often seen as the bud of a mode of national preservation that typified the Jewish communities from the Late Roman Period onwards. It was traditionally held that this was one of the major factors that enabled Jewish existence under foreign and sometimes hostile regimes both in the country and abroad. However, recent studies point at the coexistence and confrontation between Jewry, pagans and mainly Christianity – commonly referred to as the market-place model (Lieu, North and Rajak 1992, 5ff). Accordingly, the above-mentioned seclusion and constant breakdown coexisted with social and cultural interaction. It appears that the gradual nature of the Roman conquest delayed the diffusion of Roman *militaria* into native arsenals. As mentioned above, the design of *gladius Hispaniensis* diffused into Palestine (and Egypt) as early as the mid-2nd century BC (Stiebel 2004a). However, it did not modify throughout the years and appears to preserve, as late as the First Revolt (AD66-73/4), the outlines and dimensions of the late republican model. The gradualness of political and social change appears to be further reflected in the martial terminology used in Roman Judaea.

(c) The linguistic dimension

The general use of a particular language, a specific terminology and slang by a community of 'fellow warriors', was among the factors that shaped and defined a sense of unity. Latin formed the *lingua franca* of the community of the Roman army although one does find in the East an ample use of Greek as well, both in official correspondence and between the soldiers themselves. Knowledge of Latin was mentioned as one of the qualities to be sought after among new recruits (Veg. 2.19; Tac. *Ann.* 4.67.7). In Palestine, as part of the Greek speaking East, Latin was equal to Roman military presence (West: Hingley 2005, 105ff). It is thus not surprising to find that Jewish Sages made a direct linkage between Latin and the characteristic language of martial affairs: 'Said R. Yonatan of Beth Guvrin: Four languages are pleasant for the world to use; and they are: Greek for poetry (or singing), Latin for battle, Syrian for lament and Hebrew for speaking...' (PT Meg 71_b).[5] Epigraphy provides a certain amount of evidence to show that military vocabulary consisted of unique terminologies used in all walks of martial life. Despite the common use of vulgar Latin, Roman soldiers and especially their officers were apparently rather well-read (*Masada* II, No. 721, 20-21, 31-34). Throughout history, soldiers have developed and used particular military slang, which can be regarded as a means to reinforce and define identity. In their correspondences, soldiers commonly referred to each other as 'brother' (*frater*), and 'sister' (*soror*) upon addressing theirs female partners (*Tab. Vindol.* II, 291). Such an expression of

[5] My translation. PT Sot 21_c; *Esth R* 4.12.

identity and belonging reflected the sense of solidarity and friendship within the specific association. In the Greek East, and beyond, the use metaphorical familial language in reference to fellow members was typical among small group settings (Harland 2005). Similar use was found among Bar-Kochba rebels, which defined themselves by the unique appellative *ἀδελφός* ('brother') (P. Se'el. Nos. 1, 2, 6; see: Lifshitz 1961, 60-61). Interestingly, in one of the period's documents the name '*Γάϊος ἀδελφός*' appears in a list of rebels (P. Se'el. No. 2). As this *praenomen* is clearly a Greek translation of the Latin name Gaius (*cf.* one *ΓΑΙΟC ΑCΚΛΑC* at Masada: Avi-Yonah *et al.* 1957, 45, 60, Fig. 22; in Latin: P. Mas. 722), this man may be associated with the gentiles that are reported to have joined in the war against Rome (Lifshitz 1961, 60-61; Dio 69.13).

As in many other cultural aspects, Roman military language adopted terms from other nations, like Celts and Greeks, to designate military equipment. Recently, however, James has pointed out the problematic modern use of terminology with relation to identity, wondering what is the sense, for example, of labelling such a widespread weapon like the *gladius Hispaniensis* as 'Roman', or even 'Spanish' or 'Palmyrene' (James 2004, 244)? An analysis of ancient terminology (when available), employing prosopographical-like methods, provides us with a useful tool in an attempt to comprehend the evolution of social and cultural perceptions. By a prosopographical approach I refer to a study of biographical details of the individual terms in aggregate. Drawing away from a merely lexical discussion, the understanding of words, in the wider ancient context, and their use among societies would be of great interest as they mirror the existing linguistic knowledge, which in itself reflects social and cultural processes. Thus, a preliminary comparative examination of contemporary and evolving Roman, Jewish and Nabataean terminologies of military equipment, appear to reflect social trends and cross-cultural relations, at times to no less a degree than a typological approach does.

As for native forces, during the Classical periods, Jews commonly used biblical vocabulary for designating *militaria*, some of which terms were 500 years old. This was clearly the result of the prominent place of the Bible in Jewish life and identity, forming a main terminological source for the Hebrew language that still prevails to date. As I have noted in Part II, most of the items that comprise the panoply in Roman Palestine had biblical names: שריון (armour) מגן (shield), חרב, כידון (edged weapons), חנית, רומח (shafted weapons), קשת (bow), חץ (arrow), קלע (sling) (Yadin 1963b). To this we may add the layer of Hellenistic influence, that reflect not only nearly 300 years of ruling, but further the important place Greek had in the east throughout the Roman period and beyond. Among the adopted terms I include: מכירין (*μάχαιρα*), ניקון (basket), גירא (arrow) and artillery terminology (Appendix 3). Further, one finds Hebrew translations of Hellenistic items, like בית-ראש (helmet) and בית-שוקיים (greave). The upper-most layer represents the latest additions or the

intrusive role of Latin. Let us return to the above noted *gladius Hispaniensis* example. The transfer of this design from Spain to Rome and thereafter to the east, during the late republican period provides a distribution pattern of martial material culture (p. 108). When this design arrived in Judaea, the country was under Hellenistic rule and had very little contact with Rome (Stiebel 2004a). Therefore, I am not surprised to learn that in Hebrew this sword was given a clear Semitic name (כידן) with a probable biblical linkage, bearing no trace of its origins. When adopted in Judaea, it was transferred indirectly as an idea or design, with no supporting basis of cultural contacts. In fact, the term *gladius* has never diffused into Hebrew vocabulary.

However, when relations with Rome intensified, particularly with the permanent stationing of citizen soldiers in the province, one can clearly identify a diffusion of terms. Hence, in the *Mishnah* (edited in the 3rd century) we find the adoption of the term *spatha* (אספתי). An illustration of the degree of entry and assimilation processes is found in the use of this term to describe other analogous objects, like the use of the term *spatha* to indicate the weaver's sword (Ohal 13.4). Further examples of the acceptance of Latin terminology of *militaria* into Hebrew are the קסדה (*casidiss*), the קליפה (*clipus*) (p. 41), or the exact literal translation like the *vitis* = בעל זמורה (pp. 157-159). They all became the common *terminus* thus presenting additional demonstrations of the blurring of borders between societies towards the mid- Principate. Such mapping of the 'linguistic geography' of the terminology of *militaria* provides an added perspective that may even mirror the degree of cultural interaction process, as in the case of the edged weapons in Judaea. Not surprisingly, at the very same time we witness counter-influences of the provinces over Rome, which reflected the multinational composition of the Empire, particularly in the accounts of local writers. The latter used terms that were later absorbed into martial language, an example for which is the first use of the term *κόφινος* to define the military basket of the legionaries by Josephus (*BJ* 3.95), found later in Vegetius's *Epitoma* (Veg. 1.24; 2.25). It should be noted that Gichon speculated whether Vegetius was acquainted with the writings of Josephus (Gichon 1981b). Eastern influence is echoed in the use of Parthian terminology by Josephus in order to describe the *sica* (p. 113), while the close relations with the neighbouring Nabataeans from the late Hellenistic period onwards are embedded, for example, in the mutual use of the term *zrq* to indicate light javelins (p. 140) or the term *deitzah* for the small targe (pp. 83-84). Relations with the Arabs are further attested in the description of camel riding equipment that is mentioned in rabbinic sources (Kel 23.2; T BB 2.7; T Erub 2.1; Shab 51_b; Erub 16_a; PT Erub A 19_b). This is merely a survey that is intended to demonstrate the potential of such an approach, a more profound analysis of the stratigraphy of the archaeo-linguistic aspect of these relationships remains to be explored. A side-benefit of this survey is my philological

contribution of new innovations in rabbinical Hebrew, an index for which is found in Appendix 3.

(ii) Image

Recent decades have witnessed a burgeoning of scholarly interest in the question of whether there had been a differentiation policy for the equipment of the varied forces that formed the Roman army. This debate intensifies even more when broadened in an attempt to differentiate the Roman arsenal from that of the peoples within the limits of the Empire and outside of it. Only a few instances from the Roman Empire actually provide scholars with near complete assemblages of panoplies, and most rare of all are the remains that derived directly from conflict lands. In addition to the celebrated navy soldier from AD79 Herculaneum (Gore 1984; Ortisi 2005, 148ff; Deiss 1985, 21), one may mention the soldier from the well in Velsen (NL) (Morel and Bosman 1989). In the east one such very informative example is reported from Tower 19 countermine, Dura-Europos (James 2005). To these very few examples I add the remains of L. Magus from Gamala (Stiebel 2005, 102; above, pp. 171ff). In light of this circumstance the diverse images of the warriors have to be constructed from the patchy archaeological evidence. One of the challenges of artefactual studies is to draw beyond the endless technical lists of types in an attempt to reconstruct the actual image of the fighting parties. The recent decade has witnessed the abandonment of the quest for a globalised Roman military appearance in favour of what Hingley has called the fragmentation of identities (Hingley 2005, 91ff). The following paragraphs present narrated reconstructed images of the varied warriors that served in Roman Palestine – a project that will produce drawn reconstructed images is currently underway.

(a) Roman forces

One of the obstacles in discussing military equipment in Roman Palestine is the near absence of comparative material from other early Roman Near Eastern sites. Nonetheless, an overall review of the finds from Roman Palestine indicates that apart from several regional designs and amendments as well as expressions of local ornamental grammar, Roman panoplies did not differ much from contemporary assemblages in the west. True, the same conclusion was reached in the study of 3rd century Dura-Europos (James 2004, 251ff). However, despite the large number of artefacts from Judaea that was assembled in the catalogue (Volume 2), apart from the categories of armour scales (over 1000 specimens), arrowheads (nearly 2000 specimens) and *ballista* balls (some 3000 specimens), I cannot escape the feeling that the rest of the assemblage is still too small for drawing definitive conclusions regarding the true diversity of the panoplies and that the information hereby discussed is more than likely to be refined in the future. Some of the objects found in Judaea were presumably produced in a common western workshop, like the Coolus helmets from

Gamala and Schaan (III.3/A.1). Other designs became so popular that they were adopted by soldiers throughout the Empire, like the *pilum*, *gladius*, *pugio*, *spatha* and *scutum* or costume accessories like the 'Aucissa' brooches, emphasising the cultural interface function the Roman army facilitated. In many respects it seems to me that most of western and eastern Roman equipment shares rather uniform outlines and it is their ornamentation scheme, particularly the faces of their accessories (such as scabbards, sheaths, belt mounts, shields boards and harness fittings) that were subject to diversity on a regional, unit and personal basis. Other objects like slings and archery tackle were very much at home in the east and therefore it is not surprising to find they present a great diversity even more than in the west (Stiebel 2004b, 121ff).

Legion

Many scholars have discussed the question whether there was 'legionary' equipment (Bishop and Coulston 1993, 206-209, with references). In the Roman east we have had only dependable data regarding legionary equipment from Dura-Europos so far (although by the 2nd century AD distinctions in equipment were breaking down: James 2004, 168-169). As far as early Roman Judaea is concerned, Josephus provides a first hand testimony in which he describes the equipment of the legionaries as follows

> 'the infantry are armed with cuirass and helmet and carry a sword on either side; that on the left is far the longer of the two, the dagger on the right being no longer than a span... the regiments of the line have a javelin and oblong buckler' (*BJ* 3.94-95).

The dramatic discovery of Roman panoply at Gamala enables us to reconstruct the image of one legionary in AD68 nearly to its full extent. Wearing a tinned Haguenau (Coolus) type helmet (III.3/A.1-2) L. Magus was clad in '*lorica segmentata*' armour, the plates of which were laced to each other through riveted tie-loops (III.3/B.22-33), and which features a sliding rivet mechanism upon its backplate (p. 38). His right hand was seemingly protected by a tinned *manica* (**Fig. 10: 1**). The soldier's *gladius* was sheathed in a copper-alloy scabbard that was decorated by an eagle emblem (III.3/F.7-8), executed in a somewhat provincial way, with palmette designs (III.3/F.18-21) and this terminated in a silver-plated tip (III.3/F.5). In addition he carried a *pugio* (III.3/F.2) and his belt had mounts with a central rosette decoration (III.3/G.4). The soldier was further furnished with a *pilum* (III.3/H.1-2) and a *scutum* that was reinforced by flat iron bars (III.3/E.3) and framed by U-binding (III.3/B.3, 5). Two *tabulae ansatae* that flanked the *umbo* bore his name and that of his officers (III.3/B.6). He wore typical nailed *caligae* (III.3/D.1-4). The data from Masada provides further details.

The legionaries wore *tunicae albae* (*Masada* II, 56, No. 722)[6], as well as red tunics (*Masada* IV, 185, No. 85 (C), Fig. 58) and snuggled in kilted *sagi* (*ibid.*, 197-198, No. 69(L), Fig. 84, Cl. Pl. VIb).[7] In addition to the segmental armour their hands were protected by articulated plates of a *manica* (III.20/C.1). The sword was set in red leather *vagina* (III.19/F.18) that hanged from copper-alloy frogs (III.19/G.5-13). Frogs of precious metals are further attested at Samaria and Legio (I.6/G.2; V.3/G.3). The frogs were suspended from a leather belt that was decorated by silver-plated mounts (III.19/G.1). The dagger was suspended from elaborate D-shaped loops (III.19/F.26-27). The *scutum* that had integral leather facings was red in colour (III.19/E.10); the facing was stretched upon a glue-soaked layer of textile. Others may have used wickerwork shields, although these more commonly furnished native warriors (pp. 77-79). As far as ceremonial equipment is concerned, our imaginary legionary wore a silver-plated 'apron' (III.19/G.4). In light of the discovery of bone buckles and frogs (III.19/G.14-21) I have offered the use of bone sets of belt fittings that consisted of buckle and frogs (p. 128). The *sarcina* of the legionaries in Judaea comprised of: '...a saw, a basket, a pick and an axe, not to mention a strap, a sickle, a chain and three days' rations' (*BJ* 3.95; Fuentes 1991). A single example of a haversack's studded ring was found at Samaria (I.6/L.1).

According to Josephus each legion had in the mid-1st century a contingent of 120 cavalrymen. The 'select cavalry', writes Josephus, which formed 'the general's escort, are armed in precisely the same manner as the ordinary troopers' (*ibid.*, 3.97). The salary document of a cavalry of *legio X Fretensis* lists among others *caligae* and a leather strapping (P. Mas., No. 722); examples of both were recorded at the site (below).

The imaginary legionary of the 2nd century AD, or the Second Revolt period, wore a Weisenau type helmet (V.31/A.1) and dressed in stiffer scale armour, with each of its scales fastened to three others. The armour had a collar or a shoulder-piece that protected his upper torso (V.3/B.1). Shin-guards of iron greaves protected the legs of the soldier (pp. 64-65). His sword was set in a u-guttering scabbard (V.23/F.1) and he held either a tanged or a socketed *pila* (V.16/H.1; V.9/H.1 and V.6/H.1). He further held a *manoballista* (V.20/M.1), an example of which is now known from Xanten (Schalles 2005).

We possess little data that may be linked with an officer or high ranking position. The earlier figure would have carried a *vitis* (p. 157ff) or a cane/reed (p. 159), while the clothes or belt of the later would have been decorated by a 'benefiziarierlanzen' badge (III.12/S.1). A belt plate of a 3rd century *aquilfer* of *legio X Fretensis* is known from Jerusalem (Stiebel 1997a). Josephus further describes the picked infantry that formed the general's guards, noting them to 'carry a lance (*hasta*) and round shield (*parma*)' (*BJ* 3.9). The depiction of these elite troops may be gleaned from the Flavian relief of Plazzo della Cancelleria and the

[6] *Cf. SP* 395; *Ecc R* 18.1. White cloaks were imported from Judaea to Egypt: P. Ryl. II, 189.
[7] *Pallium operatorium* (*Masada* II, 55-56).

Great Trajanic Frieze (Magi 1945; Leander Touati 1987). The use of muscle armour (**PL. VI.8: 1**, Fig. 7) by high ranking officers is discussed above (pp. 51-52).

Auxilia

Horsemen formed a major force among the Roman auxiliary body. According to Josephus the Roman riders had three or more darts, with notably broad blades, in a quiver (*BJ* 3.96; pp. 139-140), which may be associated with the unique head found in Wadi Murabba'ât (V.16/H.5). The payment record of a legionary cavalryman, provides some data regarding his clothes, footwear and possibly a leather item from his *sarcina* (*Masada* II, No. 722). The *Babylonian Talmud* provides an accurate description of the shape of knee-breeches horsemen wore in the late Roman period (pp. 190-191). Part of the equipment, mainly harness fittings, that were found in rebels' dwellings at Masada, might have originally belonged to the auxiliary garrison which was stationed there until AD66 (**Pls. III.19X-Z: 1-2**). Harness fittings from siege camp F clearly equipped the contingent that garrisoned the site following its conquest (**Pls. III.20C-D: 1-2**), including a wooden phallus (**PL. III.20E**). A cavalryman's horned saddle was sheathed with embossed metal horns (**Fig. 34: 1**). The saddle was held by a girth (III.17/Q.1; IV.6.Q.1). The *spatha* that furnished this cavalryman had a V-decorated handguard, a large group of which was found at the site (p. 116). Small amulets in the image of Isis and Harpocrates adorned his neck as found at Masada (**PL. III.19Z: 3-4**). The presence of oriental-style cataphracts is noted by Josephus and possibly attested by several large iron scales from Gamala (p. 33; Type 12). These heavy mounted fighters appear to reflect Parthian or South-East European traditions (below).

The imaginary cavalryman of the Second Revolt wore an iron mail shirt (V.31/B.1) with a lower hem made of a raw of iron scales (V.31/B.2-3). His face was covered by a sport helmet of Alexander type (V.31/A.2). Greaves furnished with knee-guards protected his legs (pp. 64-66) and he held an oval plank shield (V.20/E.1). His horse was decorated by a chalcedony *phalera*, possibly granted as a *dona militaria* (Stiebel forthcoming a).

Little can be said archaeologically about the equipment of the Roman auxiliary infantry that served in Palestine. Two identical circular bosses from Gamala originally furnished oval flat shields that were employed by the Roman *auxilia* (III.3/E.1-2; *cf.* Bishop and Coulston 1993, 81-82, Fig. 46: 7; Feugère 1993, 110ff). Arabian infantry that comprised part of the army appear to have used light-throwing javelins during the Second Revolt (below). Much better is our knowledge regarding archers and slingers. The Flavian Roman force included Arab *sagittarii* (*BJ* 5.290). The distribution of the flat-headed and bodkin arrowheads in Gamala was interpreted by the excavators as indicating the ammunition of ethnic units (Syon 2002, 145). However, on the basis of the analysis of the context of discovery I have suggested that these heads reflect the tactics employed rather than the identity of the shooters (Stiebel 2005b, 101-102). Josephus notes the participation of Syrian slingers and stone-throwers in the

fights (*BJ* 3.211). Slingshot heaps that were found next to the entrances to the *contubernii* in Camp F at Masada indicate the presence of slingers in the besieging force, which consisted of Nabataean soldiers as attested by the pottery evidence (Yadin 1965, 81, note 61; Magness 2002a). Turning to the Second revolt, a single flat barbed tanged arrowhead was found in the Judaean Desert (V.17/I.2). Attested in the Roman west in Britannia alone, may its presence be explained by the arrival of Julius Severus, the Roman governor of Britannia that was especially sent to Judaea in order to suppress the revolt (Dio 69.13-14)? Although it was very easy to forge such a head, hence the notion of parallel evolution, the fact that this type appears to be so unique to Britannia seems to suggest that we should not rule out this possibility. These anomalies bring us to the question of the differences between west and east.

Regional diversity

Eastern legions, especially the Syrians, suffered from a bad reputation which was apparently a common *topos* among Roman historians (Wheeler 1996; Goldsworthy 1999, 201; James 2004, 248). Nonetheless, a different picture emerges when one reads Josephus. He refers to *legio X Fretensis* as 'most distinguished of all' (*BJ* 3.65), although this may be partly attributed to Josephus's attempt to praise Vespasian by marking the force under his command. The superiority of the artillery machinery of this legion was glorified in a later reference (*ibid.* 5.269-270). The above noted bias against eastern people was not the sole estate of ancient historians, as it appears in the writings of 19th and 20th century western scholars when discussing the Roman contribution to the east or even the Romanisation of the east. However, it is not just that some of the 'Roman' military material culture is now seen in fact as native or eastern in nature, but that we should be looking for the influence of eastern *militaria* and production traditions on Rome. The Romans met in the east a well established tradition of metal and weapon production (Ch. 7 i (*b*)). Some of the designs, like the ribbed scales, had roots that were as old as the Late Bronze Age (p. 40)! This extremely popular Roman eastern feature partly diffused to the Roman west. Like in many aspects of life and material culture in the east, the fingerprint of Hellenistic influences on Roman military equipment is evident. It was recently suggested that '*lorica segmentata*' had a Hellenistic prototype (Bishop 2002, 18ff) as did thigh-guards (pp. 60-61) and greaves (pp. 64-66). Similarly, the use of mail is well known among Hellenistic armies (p. 47). Additional clear evidence for eastern influence on Rome derives from the field of archery. The trilobite arrowhead had roots in the eastern regions of ancient Iran and Afghanistan (Bernard 1973, 196). The oval plank shield was found as early as the 2nd century AD (V.20/E.1), while the famous Duranic finds of Roman painted gesso shield boards is known in Hellenistic Ai Khanoum (AF) (Bernard 1973) as well as in the Judaean Desert (V.14/E.1). Native Judaean influence is evident in the decoration of the pelletted rosette, visible upon a frog from Legio (**PL. V.3C: 1**). This design was very common in local art of Roman Palestine, notably the principal motif used on Jewish ossuaries

(Rahmani 1994, 39-41, Figs. 72-85). Further Roman oriental designs can be seen in the scabbards from Samaria (I.6/F.1) and the Jeselson collection (VI.10/F.1); the first named examples also feature a set of suspension loops different from western tradition. An additional type of weapon that was very common in Roman Palestine and in the east was the wooden club (p. 150ff). Lastly, the dominancy of copper-alloy scales further distinguished the Roman east from the west where ferrous scales used to be more frequent than copper-alloy examples (Von-Groller 1901, Taf. XV). Of nearly 1090 scales documented at Masada, merely one scale was made of iron.

The relatively limited testimony for the use of headgear might be the result of the hotter climate (James 2004, 102). Could this explain the popularity of scale armour in the east over the segmental armour that featured relatively thick plates (in comparison with scales) and an extended surface that would have absorbed more heat? In addition, the aridness appears to explain the lack of shield covers in Judaea, so popular in the west.

(b) Foreign forces

This section is devoted for the multiply external influences and the involved military forces that left their mark on the martial material culture, indicating Judaea as a geo-cultural junction (**Fig. 35: 2**).

Macedonia

In addition to citizen forces and diverse auxiliary contingents, there are references to several exotic units that were unusually equipped. The bodyguard of Antiochus Epiphanes – the 'Macedonians' – played a small part in the Roman siege of Jerusalem. The soldiers of the kingdom of Commagene were 'armed and trained in the Macedonian fashion' (*ibid.*, 5.460). During the foolhardy assault of the wall their leader is noted by Josephus to rain arrows upon the Jews (*ibid.*, 5.464).[8]

Parthia

During the late republic, the Parthian expansion westward collided with the Roman aspirations in the east resulting in several decades of military clashes (Kennedy 1996b; Goldsworthy 1996, 60-68). For a short period of time, in the mid-1st century BC, Palestine came under Parthian occupation. Josephus's use of Persian terminology in his description of the local *sica* appears to suggest that a concrete degree of acquaintance with Persian weapons was prevailing in Judaea of the early Principate (p. 113). Indeed, Herod recruited Babylonian mounted archers that were settled with their relatives in Batanaea (*AJ* 17.24ff.; Shatzman 1991, 174-180; Issac 1992, 329-331). This force may offer an explanation for the single find of a Persian copper-alloy arrowhead at Masada (**PL. III.19U: 3**), although it maybe a reused

[8] Macedonian tradition in Roman times: Aelian *Tact.* 27.1-2, 28.1, 34.4.

item. The province of Judaea and its Jewish population stand out in the close relationships with outside non-Roman communities. The roots of the interaction with the widespread Diaspora, most notably in the east and even beyond the limits of the Empire, were based on religious ties. The annual donation to the central Temple in Jerusalem, or the monthly announcements concerning holidays that were signalled by flares all the way to Mesopotamia, were the foundation for a strong and steady linkage that could produced assistance in times of need (Pucci Ben Zeev 1983). It was suggested that a strategic reasoning behind the Roman conquest of Gamala was the need to control the route leading to Batanaea and Mesopotamia, thus preventing the possible arrival of Jewish reinforcements (Danny Syon, *pers. comm.*). For Mesopotamian Jewish warriors: below.

(c) 'Native' and local weapons

One of the major objectives undertaken in this thesis was the attempt to portray the arsenal of the native peoples. Identifying a weapon as local in origin was based on several criteria, among which I count its anomaly in comparison with the common Roman typology, or the use of exotic materials in its construction. Examples for these are the improvised javelin from Nahal Qedem (**Pls. V.19A-V.19B**) or the bone arrowheads (Stiebel 2003a, Fig. 14; **Pls. VI.2A: 5**; **I.5: 2**; **VI.7: 1**). In addition we may note historical references to specific native weapons that can be corroborated by the artefactual evidence. The *sica* is mentioned by Josephus to equip a particular group among the Jewish rebels of the First Revolt, a unique sheathed example of which was uncovered at 'Ein-Gedi (**PL. I.8: 2**).

In the Province of Judaea three main ethnic groups may be noted: Pagan, Samaritan and Jewish. The pagan local population that served in Herod's army was further recruited to the Roman army. The names of these units betray their *originum*: *Sebasteni* and the *Ascelonitae*. In addition we may note the *Ituraei*, famed for their excellence in archery, which were under the rule of Herod. Beside the material from Sebasti, no evidence for material associated with this group can be pointed out. It may be theoretically claimed that the garrison that manned Masada, prior to the First Revolt, ethnically belonged to this population. No specific equipment may be associated with the Samaritans from the period under discussion. As for the Jews, the battlefields of the two revolts provided us with a wealth of details concerning the panoplies of the Jewish rebels, discussed above.[9] For local production of weapons see, Ch. 7 *i* (*b*).

(d) Herodian weapons

Herod represents a transition period between Hellenistic and Roman influences. In a global overview he reigned during one of the most turbulent periods of Roman history, between the end of the Roman republic and the very early years of the Empire. Despite the

relative paucity of archaeological data, a tentative reconstruction of the panoply of a Herodian soldier may be still suggested. Wearing a crested Montefortino helmet (p. 20-21) that was furnished with an eastern suspending neck-guard (p. 21), the soldier was clad in copper-alloy scale armour, seemingly arranged in lines of alternating colours (p. 33) or in iron scale armour (I.4/B.1-2). He carried a long *gladius hispaniensis* (p. 109) that suspended from a belt (I.4/F.1) that was seemingly accompanied by an additional belt worn in the typical 'cowboy'-fashion arrangement. The sword was sheathed in an iron u-guttering scabbard that tapered to a semicircular chape (Stiebel 2004a, Ill. 266). He was holding a spear with a ribbed leaf head (I.4/H.1). His army clearly consisted of slingers as attested by the discovery of leaden pallets and historical references (Stiebel 1997b).[10] Riding his horse (see Appendix 1.2), a Near-Eastern horseman of that period would have used a laminated iron thigh-guard (III.3/C.1). Archers are known to shoot bone arrowheads among others (I.5/I.1). There is insufficient information to attempt a reconstruction of the Babylonian horse archers of Zamaris, although the late depictions from Dura-Europos may provide a general idea of their appearance (James 2004, Figs. 17, 177). This unfortunate circumstance is also true with regard to the reconstruction of the Roman soldiers that served in Judaea during Herod's reign. We are bound to assume that they were at least equipped in a similar manner to republican soldiers that served in the west (Bishop and Coulston 1993, 48-64; Feugère 1993, 75-107; Connolly 1997).[11]

(e) Jewish militia weapons

> 'Thus invariably have arms been refused to our nation, and warfare has been the sure signal for defeat' (*BJ* 5.399).

The poorly equipped David and the fundamental distinction between his wooden staff and stones compared to the much more advanced panoply of his opponent appear to serve us well in the attempt to describe the condition that prevailed in Palestine on the eve of the outbreak of the First Revolt. The rebels, who were organised in militias, are not expected to exhibit any standardization in their equipment, a picture that is clearly reflected from the archaeological repertoire, although varied trends and typical designs are identifiable (below). Their panoplies may be described as combinations of peasants' equipment, looted and old weapons, as well as locally manufactured and ethnic weapons. According to Philo the Essenes manifested a marked anti-war attitude, one of the expressions of which was the absence of weapon manufacturers. This indicates the craftsmen that are expected to be found elsewhere in Palestine: 'as no one, in short, attending to any employment whatever connected with war, or even to any of those occupations even in peace which are easily perverted to wicked

[9] Partial discussions based on Josephus: Price 1992, 236-237; Gichon 1998.
[10] For the sling: p. 183ff.
[11] 4th century BC *pila*: pp. 142-144.

purposes' (Philo, *Every Good Man is Free*, 12.78). The title סרטא (*sarta* = soldier) for a Jewish person, Yehuda son of Yehuda, appears once in a document from AD133 (P. Hev. 49, line 4) to be compared with the image of a Jewish rebel (**PL. V.32A: 2**).

The Jewish warrior would commonly fall under the category of *κούφους* (light-armed) (*ibid.*, 2.543) and his light panoply may be further gleaned from the rabbinic literature. The weapons that were forbidden to be carried in the public domain during the Sabbath are characteristic of the light-armed soldier: swords, bows, shield, clubs and spears (Shab 6.4), to which we may add knives and daggers (Kel 13.1). The sling, club and hand-thrown stones, which are commonly found in rural areas, were frequently employed in Judaea. For example, the rioters that attacked Agrippa's negotiators at Beth-Horon were furnished with *λίθοις καὶ ξύλοις* (*BJ* 2.526). Despite the Roman pressure, it appears that Jewish men used to carry swords, or at least possessed edged weapons even under Roman rule (*NT* Mt. 26.47, 55; Mk. 14.43, 48; Lk. 22.35-38, 52), possibly as gender and status indicators. The most celebrated edged arm in Judaea was the *sica* – a local carved dagger, which gave a rebel group its name – *Sicarii* (p. 113). The latter had a linen head-band (unpublished examples are known from Masada), and he dressed in a short-sleeved tunic (Sheffer and Granger-Taylor 1994) across which he wore a leather belt from which was suspended the sheathed *sica* (I.2/F.1). The rebels of the Second Revolt were carrying clasp knives (pp. 114-115), set in decorated leather scabbards (pp. 120-121), the popularity of which may hint that they served as a status symbol, indicating them as men or warriors, similarly to the ornate curved knives that are carried by Near Eastern men, most notably in Yemen (*jambiyas*). Our imaginary rebel of the First Revolt carried a solid iron shafted weapon, with a flat leaf head (III.12/H.1). Some of his comrades carried old weapons (*BJ* 2.576), like *gladii Hispaniensis* (pp. 107-109).

Unlike Roman soldiers most rebels were not regularly armoured (p. 32). Yadin interpreted the young male, the skeleton of which was found in close relation with armour scales in the Lower Terrace of the Northern Palace at Masada, as a warrior (Yadin 1966, 54). However, the fact that none of the scales were found attached to each other and that they do not exhibit signs of wear indicate they were Herodian spare scales and were never used as an armour suit by this rebel (p. 33). In addition, there is no evidence for Jewish rebel use of helmets during the two revolts. Nonetheless, one should not rule out the possibility of the use of looted Roman headgear, as attested by the Hebron hoard (V.31). An additional explanation may have to do to the dangers of the typical heat (James 2004, 102).

Like most Eastern peoples Jews practised archery. Bows were manufactured in the region as attested by an ear-lath from Masada that was made of ibex rib-bone (p. 244). In addition to the typical iron trilobate heads (Stiebel 2003a, 216-217; *apud* 2004b, 119ff), the Jews used flat types as well as bone heads (*apud* 2003a, No. 7; I.5/I.1; VI.7/I.1; VI.2/I.5) and

re-used copper-alloy heads from the Persian Period (p. 251). There is ample historical and archaeological evidence for the use of slings during the First Revolt (**PL. III.19V: 1**).

The finds from the Second revolt allow me to illustrate the images of two types of Jewish rebels: a heavy and a light warrior. The first is depicted after the incised warrior from Kh. as Salantah (**PL. V.32A: 2**). He held with both his hands a long heavy spear (V.33/H.1, V.10/H.1; *cf.* V.20/H.1) and protected himself using a round shield. The latter might have been the flat plank shield (**PL. V.20A: 1**), that was hitherto known from Dura-Europos alone. In addition, the rabbinical literature mentions the employment of wickerwork bucklers, which appear to have been common in the east (pp. 77-79). The light warrior was equipped by a backed dagger (V.33/F.1-2; IV.4/F.1) and the above noted clasp knives that were set in tooled leather sheaths. He held light throwing javelins with a typical collared head (p. 139), which were seemingly butt-less. In addition, the rebels held improvised shafted weapons like the 'field modification' from the Figs Caves that was composed from a re-used Roman *catapult* head (V.21/H.1). Archery continued to constitute an important place in the rebels' arsenal during the Second Revolt. The arrowshafts from the Judaean Desert present diverse personal cresting designs (Stiebel 2004b, 123ff, Pl. 3).

The military use of the horse was not very common among Jews in Palestine. Mounted archers who were Jewish mercenaries served in Herod's army (*AJ* 17.24), and two skeletons of horses are reported from 1st century BC context at Gamala (Appendix 1.3). During the First Revolt, the rebels made use of mounts for transportation as gleaned from the finds at Masada, like the horseshoe, leather harness and a cart wheel that I discovered there (III.19/Q). Beasts of burden were commonly used by the forces of Bar Kochba (P. Hev. 50, line 10; P. Hev. 56, line 9).

Lastly, the participation of foreign Jewish warriors in local conflicts is first noted during the reign of Herod. Josephus refers to Silas the Babylonian, a deserter from King Agripa's army that joint the fight against Cestius Gallus (*BJ* 2.520). Cassius Dio mentions that during the First Revolt 'the Jews also were assisted by many of their countrymen from the region about and by many who professed the same religion, not only from the Roman Empire but also from beyond the Euphrates; and these, also, kept hurling missiles and stones...' (Dio 66.4.3). Indeed, Jews from the kingdom of Abiabene, east of the Tigris river took part in the fighting (*BJ* 5.474).[12]

(f) Nabataean (Arab) weapons

Limited research has been dedicated to the arsenal of arms which equipped the Nabataean/Arab forces during the Roman period (review of the relations between Romans and Nabataeans: Kennedy 2000, 33ff; Bowersock 1983). Most of the information derives

[12] In AD30 Helena Queen of Abiabene converted to Judaism with her family (*BJ* 2.250). Members of this Royal house were captured by Titus (*ibid.*, 6.356ff).

from a few historical references and several artistic representations; namely figurines, reliefs and rock-art depictions (Bowsher 1989, 25-26; French 1988). Like Syrian and Jewish soldiers the Nabataean suffered both in ancient sources as well as in 19th-mid 20th century studies from ill-reputation. Graf asserted: 'in contrast to their commercial ingenuity, the military skills of the Nabataeans are generally held in low esteem... Nevertheless, in my opinion, there are adequate grounds for reconsidering this widely held and influential view' (Graf 1994, 265). It has been suggested that the Nabataeans imported most of their arms (Hammond 1973, 71). However, it must be remembered that arms like the sling, bow or protective devices such as the shield, the materials required for the production of which were locally available, had in this region a well-established tradition that lasted for thousands of years.[13] Whether indeed relying on import of arms or just that of raw materials, the Nabataean armament was apparently typical of light-armed foot and mounted warriors.

The distinctive feature of the Nabataean military force is evidently the camel (Sumner 1995). Artistic representations of the equipped animal provide a wealth of details concerning the nature of arms employed by the mounted soldiers (French 1988). The saddles of the Nabataean camels were furnished with short edged arms. The sheathed weapons were clearly daggers rather than swords. This notion is based upon the remarkable resemblance of the blade and pommel to that of the Roman *pugio* (p. 114; **Figs. 18: 1; 15: 4**). Hence, the blade exhibits the very typical shouldered outlines of the Roman dagger.[14] Furthermore, the distinct triple lobate pommel suggests that these Nabataean daggers were influenced by the Roman Republican type, moulded directly after the type that prevailed in Italy. Such pommels furnish the daggers that decorate Late Republican coins (Obmann 2000, Abb. 1-3). This type is also described on the tombstone of the Republican centurion Minucius from Padova (IT) (Franzoni 1982; Obmann 2000, Taf. 59: 1-2) and appears on a dagger from Tarent (IT) (Obmann 2000, Taf. 2.7), possibly suggesting that it was acquired from the Romans during that period. For Nabataean horsemen: Bowsher 1989, 22; Graf 1994, 282-289.

The Nabataeans had a very distinctive shield: made of leather, round and small. Its reflection in the literature of neighbouring Palestine is discussed above (pp. 75, 83ff). According to Negev, its shape was used as a model for the products of the goldsmiths, like earrings (**Fig. 15: 1**; Negev 1983, 125, 127). In addition, oval and round shield are depicted on trophy scenes from Maghar al Nassar, Petra (JO) (Bowsher 1989, Pl. 2.2; Mckenzie 1990, 64-66, 161). As they evidently reflect a foreign tradition that has it roots in the Hellenistic weapons friezes, like the Pergamene sculpture, little do they reflect any actual armament.

Nothing is known about Nabataean protective equipment like armour, and it is very likely that most of the warriors were unarmoured, similar to their Jewish neighbours.

[13] Early archery equipment from Palestine: Schick 1998a. Strabo and Herodotus refer to various weapons that were used by the Arabs (see below).
[14] Bowsher 1989, 26; *contra* p. 114.

Depictions of cuirasses are found sculpted on trophy scenes (*ibid.*, Pls. 65b, 66a, 66c). A possible pair of vertical fasteners of the Newstead type from the Romano-Nabataean fortress of Ein Rachel (IL) may be noted although this identification is not at all secure (p. 39). A depiction of a helmet is found on a relief from Petra (*ibid.*, Pl. 66b).

Shafted arms are chiefly known from artistic representations. A relief from Petra (JO) exhibits two ribbed spearheads behind the back of a warrior (Glueck 1965, Pl. 155c). A rock-art depiction from Hadhebt el-Hamra (JO) illustrates a fight between two horsemen, both using long spears (Graf 1994, Fig. 4). Interestingly, in the *Babylonian Talmud* one reads: 'Rabbah bar Bar Hanah said: I personally saw Keren Ofel [a high point in Jerusalem], where a certain Arab was standing [below] while riding a camel and was holding a spear (רומחא) in his hand...' (Tan 22_b). A memorial relief of a horseman from Kerak (JO) show a spear behind his back (Glueck 1965, Pl. 155a-b). In addition, two flat heads with a mid-rib from the site of 'Ein-Rachel, which was manned by a Nabataean garrison, appear to represent a type of light-throwing javelins, known in Arabic as *mizraq*, *mizrāq*, *mizraqah* (p. 140). An additional example from the early principate, which was uncovered near the walls of Kurnub (Mampsis) has a clear Nabataean linkage (IV.3/H.1). It is further found at Tel Shalem, possibly indicating the identity of some of the soldiers that manned the base.

Arabian *sagittarii* took part in the assault of Jotapata (*BJ* 3.168, 211, 262) and Jerusalem during the First Revolt (*ibid.*, 5.290).[15] A 1st century AD wall-painting from Siq el Barid (JO), describes a *putto* drawing a composite bow (Glueck 1965, Pl. 203b). The bent stiffeners are clearly discernible. The rare leaf-shaped tanged iron arrowhead, exposed in a Romano-Nabataean military site, might have been typical of the Arab archery units (IV.6/I.1). In the two occasions where fletching remains were observable on the arrows on the stele uncovered at Nahal Se'elim and Nahal David, two distinct geometries are found: Western and Mediterranean tradition (Stiebel 2004b, 124-124, Pl. 3). Though it is tempting to ascribe these differences to the opposing Roman and Jewish forces, the fact that Roman *auxilia* retained Arab archers that possibly had the same fletching orientation, prevents us from being decisive about this issue; at least until fletched stele remains will be discovered at Nabataean sites.

A popular local arm was the sling. Although Josephus mentions the participation of only Syrian slingers in the Roman force during the First Revolt's fighting (*BJ* 3.211), it is not inconceivable that Nabataean slingers formed part of the Roman force as well (Dio 66.4.2). Piles of pebbles, used as slingshots, were uncovered near the entrances of several tent units at Camp F, Masada (III.20/K). The relatively large number of Nabataean sherds excavated in the camp indicated in Yadin's eyes the origin of part of the auxiliary forces (Yadin 1966, 225). This evidence is not conclusive as in the recent excavation most of this pottery has derived

[15] The Arabs used a long bow that 'when unstrung bent backwards' (Herod. 7.69).

from the 'officers' units (Magness 2002, 190-191) presumably indicating the sources of the imported pottery rather than the origin of soldiers.

(iii) Design

The combination of not a few factors is to be held responsible for the design of weapons. Design of military equipment is first and foremost functional. Still, since a very early age it was given ornamental attention, which followed personal tastes, fashion trends as well as status and symbolic meanings (Bishop and Coulston 1993, 202; below).

The design of defensive equipment was a 'struggle' between two ends: the requirement to provide maximum protection whilst still allowing an efficient functioning. Headgear, for example, had to enable the wearer clear hearing and at the same time to protect the ears. One finds several methods to defend these organs; whereas some helmets had cheekpieces that entirely covered the ears (**PL. VI.4: 1-2**), others were furnished with ear-guards that allowed regular hearing (**Pls. III.3E: 4**; **V.31: 1**), the most extreme approach is represented by the visor helmets (**Pls. V.31B; V.31C: 1**), although not intended to provide protection in battle. Composite forms of armour enjoyed the completing advantages of both types – *cf.* Alba Iulia (RO) (Coulston 1995; Bishop 2002, 62-67) and Arlon (LU) (Bishop 2002, 74-75, Figs. 8.6-8.8). An additional composite design of armour comprises a mail shirt that is covered with scales, a fragment of which is known from Jerusalem of the First Revolt (**PL. III.12: 2**).

Offensive weapons were firstly designed to inflict damage. The design of missiles that took into account the kind of material, weight and shape used, was intended to achieve a steady flight and improved penetration. The most popular arrowhead in Judaea, the tanged trilobate type, was less influenced by wind-planing (James 2004, 195). This type of head was frequently barbed, a trait which made its extraction difficult and dangerous (Stiebel 2004b, 120-121). The bodkin design, of both arrowheads and catapult bolts, was more apt for penetrating protective equipment, like shields or armour. A special combined design that allowed both penetration and slashing is to be found in the spearhead from Wadi el-Mrarzah. The unique head exhibits an elongated blade that is tipped by a bodkin-like feature. The latter was intended to penetrate the target, which was thereafter slashed by the double-edged blade similar to the design of a *pugio* blade from the Netherlands (**Fig. 21: 1-2**; *ibid.*, 127-128). Slingshots were commonly given aerodynamic outlines, although the finds from Velsen (NL) suggest that this was not an indispensable requirement (Bosman 1995b).

The outlines of edged weapons reflected the fighting technique. Whether held by one hand or two hands (Dacian *falx*), the design of the blade commonly indicated the way they were intended to be employed. The blades of the *μάχαιρα* and the backed dagger and that of the *spatha* were mainly used for slashing blows, while the double-edged *gladius* allowed also stabbing. Connolly has explored the relation between the equipment and the soldier's fighting

position, partly drawing conclusions from the construction of the Roman helmet (1991), a concept that has been strongly criticised (Goldsworthy 1996, 219).

Convenience and efficient employment stand behind human engineering. The ribbed handle of the Roman sword is a fine example of a highly apt element for its function. It appears to be early in date (mid-2nd century BC) (Stiebel 2004a). This successful ergonomic design was adopted for some of the dagger's hilts, as examples from Masada and Vindonissa indicate (p. 116). The leather grip of bows, spear and clubs, or the leash that furnished the latter weapon similarly improved the grip of the warrior's hand and prevented the slipping of the tool during the rage of battle. Another celebrated example is the Roman horned saddle, the construction of which enhanced the safety of the ride and freed both of rider's hands. Another dimension is the shaping of a flat base for a rolling stone (**PL. I.1: 3**), which allowed it to be comfortably position at the head of the fortifications; compare with hand-thrown stone balls (Griffiths 1992, Fig. 4).

Design, particularly of local arsenals, depended upon and commonly mirrored the availability of materials. It tended to be more conservative and not a few designs had a lengthy history. The roots, for instance, of the use of canes and wicker in the production of weapons in the Roman east are planted in Biblical times, as is indicating by the striking resemblance between Assyrian shields and the wood and rawhide type discovered in Dura-Europos (James 2004, 169).

(iv) Evolution and change

Goldsworthy has pointed out that Roman organizational and tactical flexibility were major factors behind their military successes (1996, 24-28, 101-104). Although I try to avoid making cultural generalisations regarding the nature of groups and nations, it does seem that the Roman martial society, as a reflection of the civil society, was open to adopt the enemy's arsenal and tactics. Polybius describes this cultural liberalism: 'when the Romans learnt these facts about the Greeks arms they were not long in copying them; for no nation has ever surpassed them in readiness to adopt new fashions from other people, and to imitate what they see is better in others than themselves' (6.25). Setting the ground for this Roman readiness, it is interesting to examine how this process actually took place. In this context I should note that the common perception of evolution, as a linear development or even improvement is misleading. I prefer to interpret evolution as the documentation of change, the sources, directions and the rate of which were influenced by numerous factors that are discussed below. An overall scrutiny of the artefactual evolution of weapons and technological evolution seems to suggest that change was the only constant thing. The following paragraphs seek to identify the mechanisms, causes and motivations behind the variability and change of military equipment in Roman Palestine. Again, it must be stressed from the beginning that

never should one factor alone be held responsible, and a multi-factorial approach should be applied in order to fully describe this change.

(a) Militaria *and the individual soldier*

To my mind, one of the significant aspects of such a study lies in the fact that the theme of military equipment comprises of small details of which many appear to echo the acts of the individual soldier; a sort of an artefactual reflection of Keegan's 'Face of Battle' approach. Throughout history, soldiers have been involved in the modification of their panoplies[16], an act that they have personally carried out or initiated, in order to improve the equipment, to better adapt it for battle or to reflect the wearer's status. These elements expose the soldier on one hand as a 'free-spirit' individual enterpriser but in the very same time as a member of a closed society that was subjected to specific trends and 'dress-codes'. Accordingly, the unique sliding mechanism of the backplate of L. Magus's armour was a private innovation that was intended to solve a known fault of '*lorica segmentata*' (**Fig. 34: 2**). Against this background one should also comprehend the unique leaden core of the scabbard chape's tip from Nahal Arugot (**PL. V.23: 2**) that enhanced the suspension of the scabbard by presumably reducing its swing-movement. On the other hand the Roman tendency for a flamboyant appearance is apparent throughout Part II. This common trend that reflected both personal taste and status (below, and Appendix 1.3 *d-e*), is further exemplified by my new reconstruction of the horned saddle (**Fig. 34: 1**). However, the prestige and seniority of individual soldiers, along with the common human aspiration to distinguish oneself from his milieu, have been presented at times in ways that would appear strange or even unreasonable to an outside observer; for not only did the modification not improve the equipment but rather damaged it or reduced its effectiveness. From my personal experience, I may refer, for example, to a non-conventional replacement of the Galil SAR assault rifle's wooden barrel mount (handguard) by the lower barrel mount of the AK-47 Kalashnikov. This improvised modification did not contribute, to say the least, to the operation of the rifle, as it exposed the grasping hand to the heat of the barrel. However, this change was still executed for it manifested the seniority of the soldier, as the AK-47 is rarely used among IDF soldiers and forms part of rivalling forces' arsenals, and therefore indicates a combative contact with enemy soldiers or manifested an ability to pull the right strings. Similarly, it is still common among senior IDF infantry-soldiers to wear worn-out shoes and uniform, which reflect their length of service, boasting what might be described as scars of time. This kind of attitude may provide another dimension to the choice of maintaining anachronistic designs as detailed below (p. 230). Lastly, in addition to expressions of personal taste one must not overlook the economic abilities or status of the soldier as an influential factor regarding the quality of the

[16] Known as hacking.

product. In general, Roman soldiers were a relatively wealthy body of customers (Bishop and Coulston 1993, 198-199; P. Mas., No. 722). Nonetheless, some earlier interpretations regarding the use of expensive materials and the linkage between precious metals and rank have proven to be mistaken (the so-called 'Tiberius sword'; for Judaea: p. 243).

(b) The opposition factor and cultural interactions

The Romans faced multiple enemies, most of which appear to differ in equipment and tactics, a fact that obliged the Roman army to be flexible in order to successfully encounter them, sometimes concurrently. The Seleucid and Ptolemaic armies underwent a similar process in the mid-2nd century BC, adopting Roman strategies, organization and weapons in the face of Roman military success (Sekunda 2001). Polybius refers to the Roman inclination to copy other nation's arms (Polyb. 6.25). Indeed, Roman adoption of enemy equipment is well established both historically and archaeologically. A prominent example is the *gladius* which had a Spanish origin. The design of the *gladius hispaniensis* diffused in to the Hellenistic armies with Palestinian and Egyptian examples that date prior to the Roman conquest of these countries, illustrating a remarkable course of design transfer (**Fig. 35: 1**; Stiebel 2004a). This example illustrates the danger of the modern practice of general labelling of types of weapons (or any other material culture item) as 'Roman' (James 2004, 244; above, p. 208ff). The similarly designed sword, Spanish in origin, is now known to have been part not only of the arsenal of republican Roman forces, but also in countries that were not under Roman rule. This example further demonstrates the importance of studying an object within its context, rather than as a purely typological 'museological' study. Adopted foreign designs are amply found in the Roman arsenal: the Iberian dagger, Celtic helmet, long sword, mail armour flat shield and *pilum*, Greek or Hellenistic torsion artillery, siege machinery and limb defences, Levantine scale armour, Galatian *scutum* and Asiatic segmental armour and trilobite arrowhead. The encounter with a new enemy and consequently with a new arsenal often required the alternation of fighting tactics, and not least the adaptation of equipment and/or adoption of new solutions (Bishop and Coulston 1993, 204-205). These are just part of the list of adopted designs and techniques, to which this study may also add the eastern wickerwork shield that became part of the Roman panoply (pp. 77-78) or the south-eastern European vertical neck-guard (pp. 21, 30). During the Dacian wars, the Roman vulnerability to the intimidating *falx* brought about the employment of limb-defences along with added reinforcement bars to the helmet's bowl. Some 25 years later this 'field modification' established itself as the standard design, as exemplified by the Hebron helmet (**Pls. V.31: 1-2; V.31A: 1-3**). It is clear that conflicts accelerated the rhythm of development and modification of weapons. First encounters with an enemy, no doubt, brought to the test previous perceptions and equipment. Hence, the greaves that were abandoned in the early principate, and the use of which was confined to high-ranking officers alone, were back into service in

the early 2nd century, seemingly following the encounters with the Dacians (**Pls. V.31E-F**). However, the introduction of the *manica*, which was similarly linked with the Dacian Wars, is now clearly attested in the second half of the 1st century AD (p. 62).

These relations and cultural interactions, particularly cross-border influences, are part of what James has referred to as a blurring of what is different between armies, and argued is typical of military societies in confrontation (van Crefeld 1991, 174; James 2004, 242). It provides a mechanism that illustrates cross-border influences between rivalling parties which resulted in the blurring the differences. However, I find that this notion presupposes or necessitates static circumstances that existed over a somewhat extended period of time, to allow this process to have an effect. In the case of Judaea the state of affairs appears to be more complicated, for even the essential determination of what is Roman and what is local is not clear altogether. This problematic situation stems from the fact that the origin of some of the Roman soldiers, including legionaries, was in neighbouring provinces – such as Syria.[17] Even more difficult is the case of the *auxilia*, some of the units of which were enlisted in Judaea. In addition, the fact that the rebels supplied the Romans with weapons (Dio 69.12.2) does not ease our attempt to distinguish the identities. To a certain degree, at the basic level I nearly tried to avoid this general, though very important, question of identity. This notion does not derive from an attempted evasion but from a certain refuting of the globalised approach or attitude that stands behind this question. It seems to me that in the present state of research in Roman Judaea it is highly important to initially reflect upon or determine the specific circumstances that typified the province, prior to the examination and drawing of general conclusions regarding the broader picture. Nonetheless, if we are to make such a generalisation, I find that the process of cultural interaction was heavily dependent upon 'national character', suggesting that the Roman society was much open to acceptance of outside influences. This pluralistic attitude was realised on a diverse range of levels, such as intellectual, philosophic, artistic themes and even its pantheon of gods and goddesses. Part of the Roman strength as a society derived from its advanced personal consciousness in respect to the world (Veg. 1.1). The willingness of the Roman army to borrow technology resulted in a panoply that during the early principate was heavily based on previous enemies' equipment (Bishop and Coulston 1993, 194-195).

In Judaea this attitude was not necessarily true *vice versa*, thus reflecting a more complex techno-social environment. As described above the Jews exhibited a premeditated seclusion that was nourished by religious and rational justifications. The religious ban over selling weapons to the Romans formed a sort of social border within the limits of the Empire. Moreover, this seclusion resulted in the development of a distinct tradition of metal composition and production (pp. 245, 247; Ponting 2002b). Despite the given religious

[17] *Legio X Fretensis* – Dąbrowa 1993; *Masada* II, introduction and P. Mas. No. 722.

justifications for this conduct it seems to me that this conservativeness derived primarily from the wish to maintain a communal and national existence, as a mode of survival, which intensified following the disastrous results of the two great revolts against the Romans. Within the Roman army the mechanism of by which designs were adapted was clearly nourished from occupied nations as well and even more significantly from recruited soldiers, which introduced new weapons and traditions of production to the Roman army. Auxiliary units (*numeri* and *nationes*) were armed with their ethnic weapons, a tradition that persisted in the late Roman army (Speidel 1975; Southern 1989). In addition, the marked nationalistic identity of the gladiators' schools at Rome formed a bridge through which equipment and even more so fighting technique passed to the army. Claims have been made that this relationship intensified in times of crisis, when we witness the recruiting of gladiators or the adoption of gladiatorial equipment, for example limb protectors during the Dacian wars. However, the *manica* fragment from Masada suggests that these ties were more consistent and designs diffused on a more regular basis. For foreign influence, see pp. 216-217.

(c) Technical traits

The above noted vulnerability of the Roman helmet to the Dacian *falx* was due to an immanent technological problem that is linked with the manufacturing technique of copper-alloy bowls. The spinning method could have resulted in structural weakness (Bishop and Coulston 1993, 191). Hence an evident trend towards additional protection for the top and front of the bowls was given, in the Early Principate in the form of browguards and the decorative browbands. As long as the rivals were using straight swords mainly for stabbing, the helmet sufficed in its protective qualities. Once encountering the slashing Dacian weapon (Sim 2000), it required the addition of reinforcing elements (Bishop and Coulston 1993, 191). The design of more particular structural details has again been subjected to varied considerations of effectiveness. Whereas some fittings were given extra strengthening, others were produced in a manner that resulted in a certain desired failure. The shafts of arrows were strengthened by sinew whipping in order to prevent splitting upon impact. The shank of the *pilum*, on the other hand, was designed to bend upon impact in order to prevent its immediate re-use.

The structure and the materials used for production of weapons did not always suit the environment of combat. Polybius lists the problems with Roman panoplies, noting among others the flexible structure of their shield and the shrinking and rotting problem of leather covers upon contact with water that resulted in the copying of the Greek shield and arms (Polyb. 6.25). The availability of raw materials dictated the nature and quality of the equipment. During stressed times, like revolts, more exotic materials and designs came to use: wooden-tipped arrows (James 2004, 195-196) and bone arrowheads (Stiebel 2003a, 226-227), or the employment of mangles and grinding tools as rolling objects (**Fig. 36**).

(d) 'Retroevolution'

The archaeological record demonstrates that the 'life period' of weapons was beyond the service time of one soldier. Several names appear on a helmet that was recovered from the River Thames of the River Walbrook, now in the BM (*RIB* II, Fasc. 3, 2425.2, PL. XII-XIII).[18] If we accept the dating of the early first half of the 1st century AD for the Coolus type, the cheekpiece of L. Magus from Gamala (AD68) serves as an additional example of the life span of equipment (III.3/A.1-2). This observation is particularly true in less institutionalised military bodies, in which weapons were commonly transferred between generations as heirlooms (p. 251). Interestingly, all the complete *gladii* (4 blades) that were found to date in First Revolt siege sites belong typologically to the late republican type, reflecting the persistence of weapons. The most extreme example is the arrows from the Persian period(!) that were reused by Jewish rebels as late as the Second Revolt (**Pls. V.34: 4; VI.2A: 4**). Nonetheless, this observation may lead us to a theoretical model that explains the rhythm of the change from the point of view of the military equipment – the 'pendulum's movement' model. The reign of Herod represents a period of flourishing, in which Roman designs were introduced and adopted. It seems that under the Procurators (AD6-66), the local arsenal changed little, and as the army of Herod presumably formed the core of the province's military force it is not surprising to find old designs as late as the First Revolt, this degeneration may be described as 'retroevolution'. It is seemingly following the arrival of the legions in AD66 that the more up-to-date designs reached the province. This process of introducing 'new blood' into the local arsenal seemingly intensified towards the 2nd century AD, with the stationing of a second legion and the local production of weapons upon request of the Romans (Dio 69.12.2). In general, many of the designs known in the west appear also in the east, though the introduction rate of these was slower until the Roman presence in the province reached its 'full' extent. At the very same time, eastern designs diffused into the Roman west, partly corresponding with the transfer of eastern units.

(e) Weapons and anachronism

Military institutions seem to combine two opposing attitudes towards military equipment. On one hand a clear tendency to harness the most advanced technology in the aspiration to excel in the field of battle is discernable. However, at the very same time conservativeness is commonly exhibited, through consecration of traditional and anachronistic designs. During the siege of Jerusalem (AD70), a contingent was equipped and fought in the Macedonian manner (*BJ* 5.464). In the east, unlike the west, the mid-ribbed scale was the commonest design. This trait dates back as early as the Late Bronze Age (1550-

[18] A helmet from Drusenheim (FR) bears the names of two owners and four centurions (Robinson 1975, 37, 39, Pls. 84-87).

1200BC). The Roman anachronistic attitude stems in the 'noble' Hellenistic designs, some of which were out of date and less practical. Thus, Greek designs of military equipment were used by the high-ranking Roman officers and officials, an example of which is the muscle armour (pp. 51-52) and probably the spearhead from Cave el-Jay (**PL. V.13A: 1**) that may be dated to the Second Revolt. There are ample modern manifestations to this practice, among which we may note the British Queen's guards, or the Swiss guard of the Vatican that exhibit the dress code of the 17th century.

(v) Symbolism

> 'It is generally agreed to day that what most clearly distinguishes the human species from other life forms is our ability to use *symbols*' (Renfrew and Bahn 1996, 369).

The meaning of military equipment goes beyond typology and function. As objects that represent power and sovereignty, military equipment appears to be an important medium through which the varied attitudes of both Roman civil and military communities, as well as that of the oppressed peoples, were revealed. The Romans regarded themselves as the most pious nation in the ancient world, a fact that in their eyes granted them the assistance and protection of the divine. Interestingly, the notion that Roman rule was partly the result of divine intervention or sentence was similarly prevailing among the occupied nations (*BJ* 1.390, 2.390, 3.293). The Roman pantheon of gods and in particular the military pantheon were much enriched from the multinational origin of its soldiers. The soldiers addressed the gods to receive their goodness, hospitality, to ensure good health, help, protection and preservation from harm in the hostile environment of the battlefield (Le Bohec 1994, 237-238). It is not surprising to find that religion has been as, and still is, interwoven in all the aspects involved in the act of war, being manifest in many different spheres. The ways war is experienced by the state, the army as a community, the individual commander or, no less important, by the individual low-ranked soldier, differ dramatically. Therefore, the way weapons were perceived and used, in the spiritual sense, appears to shed light upon the nations, communities and individuals concerned.

Weapons were often symbolically used in state ceremonies, which played an important part in the formation and maintenance of the identity of these societies (Laurence 1996, 113ff; *cf.* 1 Macc 3.46-60 and Bar-Kochva 1980, 173ff; 1QM and Yadin 1962, chap. 8). The ceremonial manifestations that occurred previous to, during and following the fighting made an intensive use of weapons, aspects of which are hereby discussed. While on the state-level weapons functioned as symbols of sovereignty and formed an important part in imperial propaganda that was designed to strengthen its coherence, among the comrades in the military community *militaria* appears to define the identity of soldiers and manifest the hierarchy of this closed society. Moreover, as part of their *Kriegethik* (military ethic), the Romans regarded weapons as an entity with virtues that could be violated by improper behaviour

(below). The individual soldiers used their equipment as a platform for the manifestation of symbols; the decoration and the shaping of varied fittings in the image of sacred motifs, was aimed to ensure protection and successful operation in battle. In not few instances the stylistic choice reflects the religious affiliations of the soldiers and manifested imperial propaganda. Inscribed leaden slingshots were often accompanied by religious symbols, such as the *fulmen* or trident, and contemptuous icons, like the phallus. Painted Roman shields similarly manifested values of unity, and the symbols adorning them were commonly drawn from religious themes, like winged *fulmen* (Stiebel 2003b). In addition, weapons were often used as actual 'messengers' in psychological warfare. The celebrated example is the inscribed leaden slingshots which bore both supportive and blasphemous slogans (Stiebel 1997).

(a) Status

Weapons constitute a status symbol, in ancient and not least in modern times. Carrying weapons clothed in military dress defined soldiers from the civil population (Coulston 1998, 184; military dress: James 2004, 57ff, 246ff). Weapons have clearly been a key defining feature of individual rebels and militia groups, one Jewish rebel party in Judaea was named after its characteristic weapon – the *Sicarii* (p. 113). The very act of carrying arms identified the bearers as warriors not only in the eyes of the local civilian population but in the eyes of the Roman authorities and as such bore hazardous implications. The fate of Jewish captives at Jerusalem was very much related to their status: 'since the soldiers were now growing weary of slaughter, though numerous survivors still came to light, Caesar issued orders **to kill only those who were found in arms** and offered resistance, and to make prisoners of the rest' (*BJ* 6.414; my emphasis). Primarily, weapons reflected the status of their bearer, hence the pride of the individual Roman soldier in his arms that is expressed by his fondness for gleaming appearance (Coulston 1998, 184). In addition to being a manifestation of personal taste and a reinforcement of the identity felt by the individual soldier, the shiny appearance of equipment was further intended to intimidate the enemy, a lavish example being the Roman exercise of the *hippika gymnasia*.

It appears that Roman military equipment distinguished units (most notably the *nations*), and at times identified ranks (below). A prominent example is the *vitis*, which was carried by centurions and served as disciplinary tool as well as a status symbol. This was true also in the eyes of the local Jewish population, which associated the rank בעל זמורה (*ba'al zmorah* – lit. the owner of the *vitis*), with harsh and vicious behaviour (p. 157ff). Some of the fittings were clear badges of office, like the *beneficarius* badge from Jerusalem (**Pls. VI.3: 3-4**). It belongs to a stylistic group, commonly referred to as 'benefiziarierlanzen', which includes few 'standards' (Alföldi 1959a; *apud* 1959b; Austin and Rankov 1995, 200-201; Eibel 1994, 278-280, Abb. 6-8) as well as miniature badges and strap fittings, reported to date from the UK, Germany and Pannonia (Eibel 1994, 280ff, Abb. 9-16; Oldenstein 1976, 152-157, Taf. 39-40,

Nos. 366-387; Allason-Jones and Miket 1984, 204, No. 3.674; Klein 1999; James 2004, 52). In addition, this element is depicted on many *beneficiarii*-inscriptions (Rankov 1986, 100-115; Eibel 1994, 294-295, Taf. 1; Schallmayer *et al.* 1991). The spear-model from Jerusalem is analogous to the spear-model from Stockstadt (DE) (Oldenstein 1976, 153, Taf. 39, No. 366). Both share a long shaft and the typical bulbous tip. An additional example comes from Vindonissa (CH) (Klein 1999, Abb. 9) although its head is of somewhat different form. In the absence a means of fastening it seems that these spear-models were pinned on to the soldier's belt or to his garment. These badges were meant to be a visual indicator of the position and authority of the bearer. It should be noted that the growing number of eastern examples appears to undermine the suggestions that these badges were typical of Upper Germany alone and that each province had its own distinguishing markers (Oldenstein 1976, 152-155; James 2004, 52), pointing rather at a more homogenous symbolic grammar, that has been used on widespread scale at least for this specific official.[19]

(b) Sovereignty

Weapons commonly appeared in official propaganda, being a symbol that represented the sovereignty of the ruler and the state. The shield, for example, had an important place in the coinage of late Hellenistic and early Roman Palestine. What has solely been identified as a star and tiara, the attribute on the coins of Alexander Jannaeus (Meshorer 1997, 40-41), is in fact an emblem of the Macedonian shield. The helmets on Herod's and his heirs' coins are similarly interpreted as a symbol of sovereignty (*ibid.*, 61, 73-75). Motifs that reflect Roman governmental propaganda often appeared on weapons (Feugère 1993, 260-261). The promotion of the 'cult of personality' as part of the Roman imperial propaganda was very much on the agenda of Augustus. His initiation brought about the manifestation of politico-religious symbols, like the capricon, on the equipment of western legions (Künzl 1988). This, however, was not the case in early Roman Judaea. Only during the First Revolt does one find these motifs in the decorative repertoire. It seems that geopolitical circumstances dictated a different grammar of motifs. This trend presumably skipped Judaea in the days of Augustus owing to the fact that during most of his reign the client kingdom was not part of the Empire, in addition to the dominance of Herod that seemingly prevented its introduction. Furthermore, the expression of this propaganda was more common among citizen forces, which were not present in Judaea until the First Revolt.

One of the expressions of triumph by victorious rulers that did diffuse into Judaea, despite religious reservations, was the presentation of spoils of arms in the temples; a well rooted tradition in the Classical world. Weapons taken as booty were presented on the walls

[19] Two monument of a *beneficarii* were reported from Seia (Si'a) (SY) (*AE* 1936, 142; Nelis-Clément 2000, 357-358, No. I 122, Photo on p. 556) and Emmaus (IL) (*CIL* III, 14155.12; Nelis-Clément 2000,

of the Temple and theatre in Jerusalem (*AJ* 15.402, 272, 276).[20] A relief of dozen shields and four swords on a monumental capital was recently discovered at the site of Legio (**PL. V.3B: 1-2**). All the elongated hexagonal shields are decorated by a floral wreath. The number of shields may recall that of the *ancilis*, sacred to Mars, which were cherished in the chapel of the Regia at Rome (see below).

(c) Ritual

The Jewish religion regarded weapons as tools of destruction. It was thus forbidden to enter the Temple in Jerusalem, as well as religious schools, armed (Sanh 82.1-2). This raison d'être stood behind the ban over the use of iron for the shaping of the large stone altar in the Temple and fighting during the Sabbath, a thoroughly discussed theme. As a society that at least during the early Roman period still perceived itself as being under occupation, it was necessary to provide an explanation for the continuous Roman success and the repeated Jewish failures (*BJ* 5.399). Josephus justified this state of affairs by divine intervention (*ibid.*, 1.390, 2.390, 3.293).[21]

In Roman society one clearly identifies an interrelation between ritual and warfare. To ensure divine support it was important to meticulously keep to the correct performance of the involved ritual acts (Laurence 1996, 113ff).

Belomancy

Prior to the commencing of war, the Roman commander shook the sacred spears of Mars (*hastae Martis*) in the Regia, where they were kept. Shaking the spears, the general said the words: '*Mars vigilia*' (Mars wake up), pleading the assistance of the god. Quite universally, the brandishing of weapons was considered as a conventional symbol of threat (Krauss 1948, 208; Job 41.19 and *Gen R* 74.51). A paragraph in the Aggadic chronicles furnishes us with an additional dimension of the spiritual usage of missiles. Jewish sources have preserved several references to the Roman world of beliefs, in which the *augurium* played an important role. One such reference is found in the *Midrashim* where the king of Babylon is described standing at a road junction starting

> '*...To use divination*': he begun to practice divination. '*He shaketh the arrows to and fro*': he begun to shake arrows in the name of Rome but without success, in the name of Alexandria but without success, then in the name of Jerusalem and it succeeded' (*Lam R* 23).

359, No. I 127). The בנפיקירין (=*beneficiarii*) are noted in the *Midrash* among the classes that were given land *Optimo Iure* in Palestine (*Sifra Deut* 317; for its date, see: Mor 1991, 68-69).

[20] Friezes of congeries of arms occur in the neighboring Nabataean architecture.

[21] *Cf.* Strabo *Geog.* 16.2.36.

Krauss perceived this paragraph as evidence for belomancy (arrow oracle) being practised in Rome as well (Krauss 1948, 170-171). One further reads about consultation with arrows, which is attributed in the *Talmud* to Nero (Git 56_a). The Roman connection is not conclusive, as the references in *ADRN* and the *Babylonian Talmud* echo Ezek 21.26. Nonetheless, Kister has pointed out the analogy in many important details between Sennacherib's siege of Jerusalem, as it appears in the Talmudic and Midrashic sources, and the siege of Titus (Kister 1998, 513ff, note 174).

(d) Morality

Flamininus asserted that 'brave men should be hard on the enemy in battle...but when they conquer gentle and humane' (Polyb. 18.37). Despite the famous words of Cato that '*inter arma enim silent leges*' (*Pro Milone*, Chap. 4) Roman military authorities and supposedly Roman society in general as well appear to have had certain expectations from the Roman commander and his soldiers, part of which constituted Roman military law (Brand 1968). There is ample evidence for the existence of an unwritten 'code of behaviour', which would have fall under the category of the Roman conception of *Kriegethik* or military ethic (Laurence 1996, 114ff). The Roman warrior was expected to refrain from uncivilised behaviour, which was, in official eyes, the sole estate of the barbarians (Stiebel 2005a). He was supposed to be a fierce combatant as well as a gentleman, at least according to imperial convention, or more accurately, its propaganda. Atrocities were not uncommon when they were perceived as in the army's best interest, and at times were regarded as legitimate tools of conquest (Gilliver 1996). Still, ill-conduct of a soldier would have been regarded as a disgrace to Roman arms, particularly if the offender was a legionary. When, following a rumour, Roman soldiers slashed open, in AD70, the bellies of 2000 Jewish refugees in search of golden coins, Titus responded angrily. It was not the participation of the *auxilia* that enraged him, although they gave 'unrestrained license to their passions', but much more the fact that: 'some of his own soldiers also were involved in the charge'. 'He was indignant', we read, 'that soldiers in his service should be guilty of such acts for the sake of uncertain lucre, and did not blush for their own arms, made of silver and gold[22]' (*BJ* 5.554-556).

(e) 'In hoc signo vinces'[23]

Weapons provide power. Yet, in the mental atmosphere of the ancient world it was not harmful to recruit the assistance of the Gods through weapons. The design of some fittings as well as elements that decorated *militaria* seems to have been carefully chosen in order to ensure the alliance of the gods with the right side. Theses motifs coupled with the far better

[22] *Cf.* Livy 9.40.4-5.
[23] Eusebius *Vita Const.*, 1.27.

studied epigraphic evidence hint to the social and religious background of part of the Roman forces operating in Palestine.

As in the west, harness fittings are found to exhibit a strong affinity with viticulture, while the combination of the solar and lunar motifs in lunate pendants (*lunulae*) was also favoured by Roman cavalrymen (**Pls. III.3AN-AO; III.19X: 2-5, III.19Y: 1**). Both symbols were intended to protect the horseman and his mount (Bishop 1988, 107-108). Lunar motifs further decorated the helmet from the Hebron district (V.31/A.1). The same protective function was assigned to phallic elements. Phallic pendants were used to decorate equine harnesses[24] while a complete wooden phallus is reported from siege-camp F at Masada (**PL. III.20E: 1**). It is interesting to note the marked differentiation in the nature of the populations that used these pendants between the civil and military communities. Whereas, among civilians the *lunula* and the phallus were nearly confined to women and children (Mattelaer [2000?], 29; James 2004, 51), among the Roman army these motifs were very popular as harness ornamentations during the early principate and later. It is less likely to reflect a high percentage of mares in military service, for the Roman army is claimed to be more male-based (Hyland 1990, 81-82), although the Krefeld Gellep finds may suggest this is not so conclusive.[25] The near-humanization of horses, by granting them with names (Toynbee 1973, 178-183), may reflect the attitude of the horsemen to their mounts and the will to protect them. It is left for future research to examine the reasons behind the popularity of the women-linked *lunula* and phallus symbols and even visor helmets with feminine facial features, among Roman cavalry. The latter items negate James suggestion that *militira* of feminine design was associated with horses and not worn directly on the body of the warriors (James 2004, 52).

The Roman pantheon is further represented by Isis and Harpocrates that appears on two amulets from Masada (**PL. III.19Z: 3-4**). These rare objects testify to the popularity of the eastern and particularly the Egyptian goddess among soldiers.[26] Young Eros appears on the chalcedony *phalerae* that seemingly served as harness fittings (**PL. V.22A: 2; V.22B**; Stiebel forthcoming a). The popularity of Jupiter is attested by the *fulmen* known on slingshots and shields (Stiebel 2003b). One the chief symbols of the legion and Rome has been the eagle. Its image is seen on several 1st century *gladii* scabbard chapes from Gamala (**PL. III.3AB: 1-2**).

The symbolic role of weapons has been part of the world of omens and superstitions. One of the portents of the end of Jerusalem was 'a star resembling a sword standing over the city' (*BJ* 6.289).[27] Weapons were commonly linked with divine occurrences and proverbs. Josephus cites Herodotus, who ascribes the removal of Sennacherib's siege from the city of

[24] Bishop suggests that the phallic pendants were used with pack-animals rather than horses (1988, 98).
[25] Gamala horses: Appendix 1.2.
[26] Palestine: Mithras – Magness 2003; Mercury and Apollo – Stiebel 1999, 79-80, 97, Fig. 3; Mars – Peleg 2000, 65-70; *Genio Africae* – Abel and Barrios 1931, 282-294.

Pelusium to mice, which nibbled the Assyrian bows (*AJ* 10.19; Herodotus 3.141; *cf.* Eusebius, *Praep. Evang* 9.434d). Archery gear played an important role in the religious debate that forms part of the legend about the Jewish archer Mosollamus (*Contra Apion* 1.201-204).[28]

(f) Surrender and humiliation

Laying down one's weapon is not just a literary way of describing despair and surrender. Throwing arms at the feet of the opposing leader as an act of surrender was performed by thousands of deserters of the followers of John of Gischala (*BJ* 2.625). Further examples of the flinging of weapons (*ἀπόθεσιν*) or their laying down (*ῥῖψαι*) (*ibid.*, 4.270) or *κατέβαλλε τὰ ὅπλα* (*ibid.*, 4.308), out of despair, can be found in Josephus's account.[29] This kind of behaviour was further performed by rebelling parties. Facing a bitter attack of John of Gischala's supporters, Josephus appeared 'with raiment rent and ashes sprinkled on his head, his hands behind his back and his sword suspended from his neck' (*BJ* 2.601) in an attempt to escape. This display was there portrayed as 'pitiable' (*ibid.* 2.603).

Midrash ADRN contains several descriptions of the Roman siege and conquest of Jerusalem. Known as the 'Legends of Destruction', these treatises are based upon old traditions in which authentic episodes are interwoven. An interesting paragraph in version A of the *Midrash*, contains the words of the Roman commander during the siege of Jerusalem to the city's defenders: 'and what do I request from you but that you will send me one bow or one arrow and I will go away from here' (Version A, 4, 22).[30] It is clear that his words were part of the negotiation in which proclamations offering the city, or its warriors, immunity from death were made. The smooth language used should not baffle us. The speaker had no intention of leaving the place. His object was to subjugate the city and with as few casualties as possible for his force (Eph'al 1996, 46ff). Kister cites a 9th century AD Syriac source that mentions such a gesture, but he asserts that he could not trace the origin of this custom (1998, 507 and note 143). It appears that the submission of archery equipment as a symbol of capitulation, and triumph in the receiving side, had had a long history, presumably commencing in the ancient Near East, where archery was much at home. Artistic representations in Mesopotamia portray the Assyrian kings grasping in their right hand a pair of arrows. In the culmination of the celebrated sculptured scene of Sennacherib's siege of Lachish, the king is depicted sitting on his throne, examining the spoils of the conquered city. His left hand grasps a bow and his right a pair of arrows, marking the victory in 701BC (Ussishkin 1982, Figs. 89, 100). Arrows played a symbolic part in the proceedings of war and during royal tribute acceptance. Should the tips of the arrows be turned upwards it indicated

[27] *Cf.* the signs reported from Ameria and Tuder: Plut. *Vit. Mar.* 17.4.
[28] Bar-Kochva 1996; Gera 1999.
[29] *Cf. AJ* 20.123; Civilians used to carry olive branches (*BJ* 4.554).
[30] My translation; Kister 1998, 507.

peace, while turned downwards the attribute signalled hostility and war (Van Buren 1945, 159; Iwry 1961, 29, note 10). According to Herodotus, in order to symbolise his honest intentions towards the Ethiopian king, Cambyses, king of the Persians: 'unstrung the bow, and gave it into the hands of the messengers' (Herod. 3.21.2-22.1). Depictions of kings grasping bows and arrows were very common in the Macedonian and Hellenistic coinage, presumably reflecting their sovereignty if not commemorating a triumphal event.

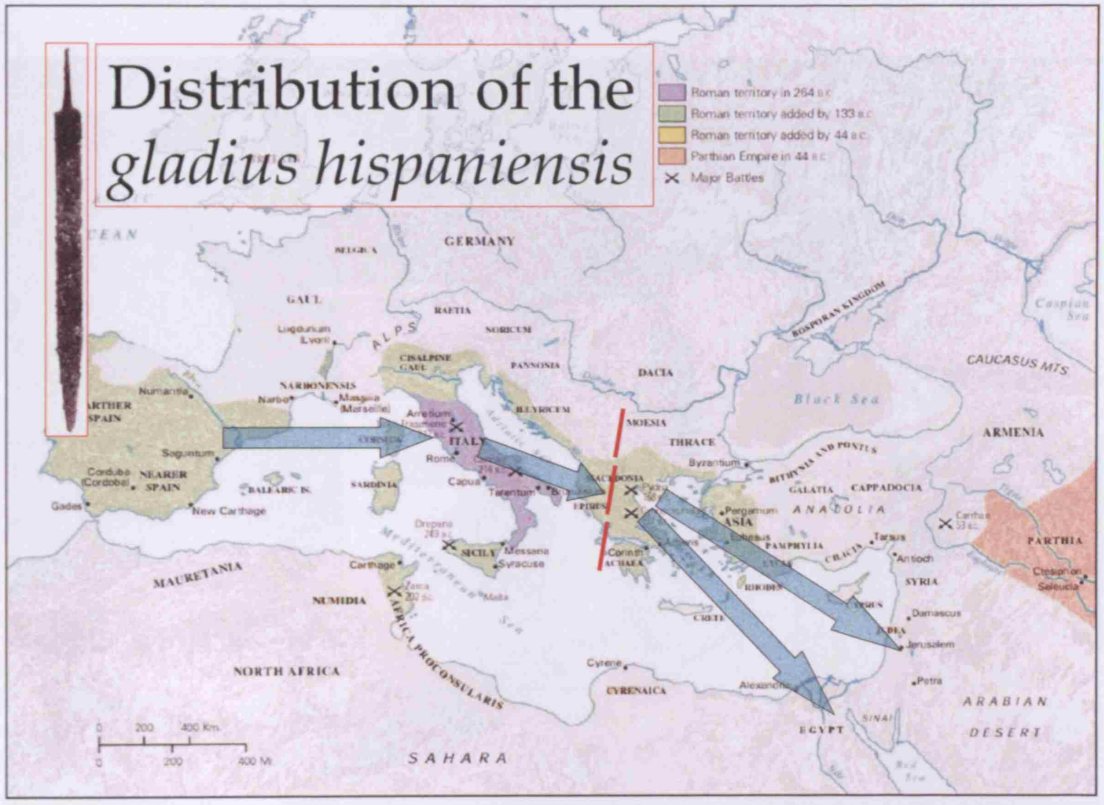
In Version B of *ADRN* we read a slightly different account of the suggestion given to the defenders of Jerusalem: 'break from me one bow and (or) one arrow and I will leave' (*ADRN* Version B, chapter 6, 19). Kister dismisses the validity of this version merely describing it as 'odd' (Kister 1998, 507). In the ancient Near East, the removal of the bow from its carrier was an act of humiliation, directed to harm his masculinity (Hillers 1973, 74). In a 7th century BC royal correspondence we read: 'may Ištar, the goddess of men, the lady of women, take away their bow, bring them to shame, and make them bitterly weep...' (Parpola and Watanabe 1988, 12, § 8: 13-15). Furthermore, a letter of Esarhaddon (680-669BC) contains the curse – 'May Ištar, lady of battle and war, smash your bow in the thick of battle' – clearly referring to the breakage of bows (*ibid.*, 48, § 48: 453). In Psalms 46.10, we read: 'He maketh wars to cease unto the end of the earth; He breaketh the bow, and cutteth the spear in sunder; He burneth the chariots in the fire'. The very act of intentional breakage of a bow, as a symbol of surrender, is clearly documented in the Near East. In an inscription that accompanies a 7th century BC Assyrian relief, we read about a high official of an Elamite king, that 'his dagger cuts the bow that is the symbol of his power' (*ibid.*, 48, Fig. 15).[31] This act of surrender, which is manifestly depicted in the relief, is taking place on the battlefield, following Assurbanipal's victory over the Elamite army. Interestingly, the Elamites are noted with a similar association in the Bible: 'behold, I will break the bow of Elam the chief of their might' (Jer 49.35).[32] Therefore, the second version of *ADRN*, as well, appears as a plausible description of the Roman commander's surrender demand directed at the besieged defenders.

The symbolic meaning of weapons in the military community is further exemplified by the act of disgraceful discharge of soldiers from the Roman army that involved the confiscation their weapons. A Roman soldier that was taken captive, during the siege of Jerusalem, managed to ward off his coming death and fled back to the lines of his army. 'Titus could not bring himself to put him to death' (*BJ* 6.362), but since he failed the expected

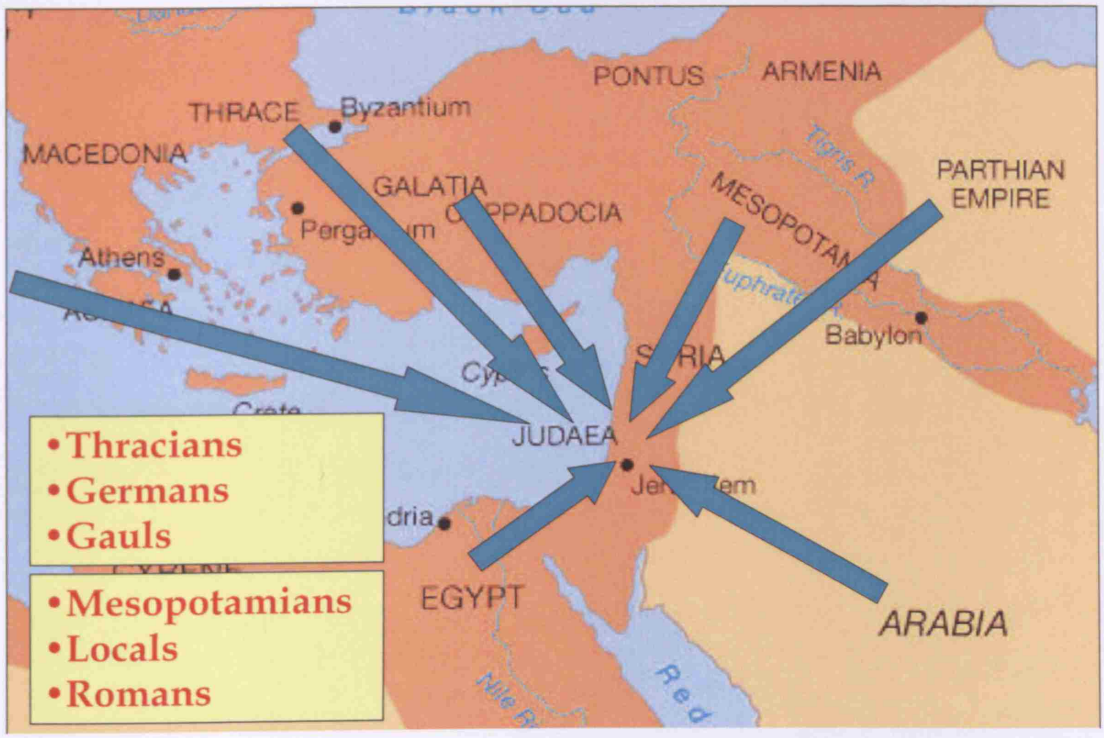
[31] I thank Prof. Israel Eph'al for the translation.
[32] Sanh 89_a.

level of soldierly conduct Titus publicly discharge him from service by depriving him of his arms (*ὅπλα ἀφείλετο*).

Fig. 35



1. The course of the *gladius hispaniensis*'s design transfer



2. Judaea as a geo-cultural junction

7. Production, maintenance and storing

(i) Production

Weapons production of the early Principate is generally linked with two main spheres: civilian and military. The various suggested models of Roman martial production differ in the dominancy ascribed to each centre during that period, as well as the place given to regional factors. Early works of MacMullen (1960) and Robinson (1975, 8) determined that production was mainly civil-oriented and the army was only engaged in equipment maintenance and repair. Oldenstein provided an alternative mechanism, suggesting that the Romanization process of the frontier provinces brought about a gradual shift from a local civil-based to a military-based production (1976, 68-85; 1985). A more diverse approach was presented by Bishop and Coulston, who underline the regional differences between west and east (Bishop 1985b; Bishop and Coulston 1993, 183-186; Coulston 1998a, 170). The orient is taken to depend predominantly upon urban manufacture whereas the west is stated to be military-based (*apud* 1985, 257). It appears, indeed, that an attempt to provide one mechanism, which is true empire-wide, is too general and trivial, and our emphasis should be devoted to a more regional level of explanation that takes into consideration the specific conditions of each province; that is economical factors, traditions of production and sources of materials. In addition, focusing upon a specific area throughout a period of time seems to allow the establishment of finer distinctions which reflect the idiosyncratic process of evolution that specific provinces underwent.

In the ancient Near East, metal production centres have been traditionally urban. The city was the focus of the industry that flourished under the auspices of the authorities as early as in Biblical times. This tradition was still prevailing in the Late Roman and Byzantine periods, developing into state weapons factories (*Not. Dig. Or.* xi 18ff; Isaac 1994, 275; James 1988). Archaeometric tests have provided indications for the co-existence of several traditions of metal production in early Roman Judaea. In addition to Roman production these tests seems to define two distinct local traditions that correspond to clear social and religious differences that are manifested in the rabbinical literature (below). A rural branch of metal manufacture co-existed with established urban centres of production. Seemingly devoted to the production and maintenance of agricultural utensils, these rural craftsmen were capable, in time of need, of producing arms as well. Indeed, the secret preparations that preceded the Second Revolt took advantage of these capabilities (Dio 69.12.2; below). It should be noted that the rebels have been commonly acquiring weapons through less orthodox routes, like looting and booty (below). On the other hand local smithies were apparently between a rock and a hard place, as during conflicts they were forced to provide Roman military authorities

with weapons (Oldenstein 1976, 68-86; Bishop and Coulston 1993, 183-184). Analytical and typological studies indicate that Roman *militaria* was brought into the province, the Roman soldiers seemingly acting as economic ambassadors (below). Still, one has to take into consideration the persistence of local production traditions; that is to say that 'old habits die hard'. When we examine the morphological and compositional data that emerges from Judaea, it seems that Roman introduction to Palestine in 63BC did not change the common Near Eastern production tradition, which in the case of the *militaria* presumably lasted as late as the First Revolt (scale armour Type 1). It appears that only the permanent stationing of Roman legions to Judaea, following the suppression of the First Revolt, *X Fretensis*, and more profoundly in the stationing of the non-eastern *VI Ferrata*, introduced new production traditions into the province.

(a) Supply of materials

A wealth of materials was required in the production of *militaria*, among which one may count metals, stone, wood, cane, bones, leather, sinew, feathers and dyes (Appendix 1.3). A short discussion concerning the origin of supply in Palestine of the varied materials is hereby included. The main challenge seems to lie in the fact that Palestine has been relatively poor in metal ores, and it is merely copper and some ferrous minerals that have been locally available. In light of these limited sources, import of varied metals was required. The closest source of lead appears to be Cyprus, while Tin may have been imported from Afghanistan (Schneider 1984; *apud* 1982). Noble metals like silver and gold had to be imported as well. The nearest silver mines were in Asia Minor, which was also the origin of gold as were south Egypt and the western coast of Arabia. We should note though, that the annual tribute of the Jewish Diaspora to the Temple in Jerusalem was a major source of precious metal utensils, one that time and again has been abused by the varied conquerors and foreign governors of Judaea. One remark concerning the identification of production materials, particularly metals, should be made. It has been argued that 'modern scholars have been all too willing to elevate what must have been common items to the status of 'works of art'' (Bishop and Coulston 1993, 192; Coulston 1998a, 175). Good examples of this tendency are the copper-alloy scabbard chape from Gamala which is asserted to be made of gold, or the tinned objects from Gamala, like the helmet components of L. Magus, that are described as silver-plated (Gutman 1994, 64, 85, 97, 98; Syon 2002, 145). Moreover, in the latter case, the excavators erroneously determined the rank of the equipment owner as an officer (*sic*) due to the false identification of the coating agent (*ibid.*; Bishop and Coulston 1993, 38). It is clear that a wider use of archaeometrical data is required.

Organic materials like leather, sinew, os-materials and wood are ample in Palestine. The more temperate regions of Palestine enjoyed the supply of wood and timber, which have been

far scarcer in its arid zones (Thuc. 4.9.1). Timbers were utilized for the construction of siege machinery under the command of Vespasian and Titus (*BJ* 3.221). Worked cedar beams that had been imported from Lebanon for the construction of the temple and were considered sacred, were used by John in the erection of towers (*ibid.*, 5.36ff). Local trees and branches as well as plantations were cut for the construction of siege ramps (*ibid.*, 3.221), as well as part of the psychological war (*ibid.*, 5.107). Bone, antler and ivory were processed in the production of archery and edged-weapon fittings. A DNA analysis of a bone ear lath from Masada indicated the use of Ibex bones. The local wild deer was hunted, either in the Judaean Desert, in Jordan or in Southern Syria. One *spatha* handguard from Masada is clearly made of elephant's tusk, though its exact source, whether African or Asiatic, is still to be established.

(b) Local production and fabricae

The theme of Hellenistic weapons in Palestine is somewhat a *terra incognita*, particularly from the artefactual point of view. Nonetheless, it may be said that in the early years of the Hasmonaean dynasty the Jewish force was ill-equipped and was based much upon scavenging. It seems that the consolidation of the kingdom, its expansion, the establishment of an orderly army that included also mercenary units and the employment of Hellenistic weapons and fighting tactics, required or involved a more organised production system. The weapons of the War Scroll, which I have assigned to the Hellenistic tradition, rather than the commonly held Roman influence, reflect a high level of production, which is partly corroborated by archaeological finds in the country.

The scale of arms production during the Herodian period in Palestine is unknown. My analysis of the assemblage has enabled me to point out several items that originated in this period, namely: rolling stones, iron swords and scales. The historical sources are silent with regard to the nature and extent of Herodian production of weapons, but occasionally do mention its existence. Herod had an organized and managed arms production system as clearly reflected from his preparations at the site of Masada. Josephus writes that storerooms were stacked with raw materials for arms production – *ἀργόν τε σίδηρον* (unwrought or shinning/white iron), *χαλκὸς* (copper-alloy) and *μόλιβος* (lead) (*BJ* 7.299). Similarly, 'for making arms', Vegetius advises the defenders of a city to accumulate in advance 'iron of both tampers and coal' that 'are kept in magazines (*condita*)' (4.8). The diverse origins of soldiers in the Herodian army (*BJ* 1.672-673) suggest at least some degree of import. I have suggested that the helmets that decorated the king's coins exhibit a combination of both Roman and oriental features (2003a, 215-216).

Second Temple period Judaea comprised of mixed populations. In a recent study of copper-alloy objects Ponting demonstrated that there are indications of technological differentiation between pagan and Jewish metal products in the Galilee (2002b). Differences like the deficiency of brass artefacts in Jewish settlements appears to reflect the cultural 'increasing exclusion of objects with clear Roman association' (*ibid.*, 3). Furthermore, the study points out different casting traditions: the pagans used highly leaded bronze which accords well with Late Hellenistic and Roman metal work (*ibid.*, 6), while the Jewish approach is akin to the traditional Near Eastern technique that used minimum lead in casting. An interesting approach against the production of arms, which had an ideological raison d'être, was attributed by Philo to the Essenes

> 'Among those men you will find no makers of arrows, or javelins, or swords, or helmets, or breastplates, or shields; no makers of arms or of military engines' (Philo *Every Good Man is Free*, 12.78).

However, the apocalyptical ideas and militaristic knowledge, including detailed references to weapons, that emerges from the War Scroll may suggest otherwise (1QM; Yadin 1962, chap. 6). Local forging of arms clearly took place during the First Revolt. Josephus notes that in face of the Roman siege of Jerusalem 'in every quarter of the city missiles and arms (*βέλη καὶ πανοπλία*) were being forged' (*BJ* 2.649). Indeed, two foci of hearths that were excavated in the Western Palace, Masada (L442, L456), have been interpreted as smithies of the rebels (*Masada* III, 250, 285-286; Magness 1992, 63) and presumably had been used for forging of arrowheads. In L442, 111 iron arrowheads were found together with iron lumps and slags indicating the existence of a smithy workshop (*fabrica*). Interestingly, this locus contained a large concentration of walnut shells. Were the woody shells intended to be used in the production, as a source of carbon? The metallurgical examination of an iron arrowhead from Masada points out the employment of the technique of hot forging from bloom iron (of uneven carbon content) for its production, suggesting a low technical level, which was certainly mastered by the rebels (Knox, Maddin, Muhly and Stech 1983). In Palestine, it was customary to use coals of broom in the production of arrowheads (Psalms 120.4). Broom tree, and particularly the white broom, was favoured as its coals maintained heat for a prolonged period of time, a much desired trait in the production of ferrous-tools. Unlike other coals, they can be extinguished on the outside, still maintaining a significant degree of heat on the inside (*Gen R* 95.19). Direct evidence for local production during the Second Revolt was uncovered at Herodium (Stiebel 2003a, 220). Seven hearths (*tabuns*) were found, one of which was associated with 28 iron arrowheads. Moreover, the Jewish population was not

only capable of producing arms, but supplied the Roman army with weapons (*cf.* Coulston 1985, 257)

> 'They purposely made of poor quality such weapons as they were called upon to furnish, in order that the Romans might reject them and that they themselves might thus have the use of them' (Dio 69.12.2).

Indeed, a group of metal production tools found at Bethther (V.6/W) derives in all likelihood from the Second Revolt. The Sages' discussions clearly mirror the local knowledge in metal production. A through acquaintance with iron production is embedded in the War Scroll (Stiebel 2004a, note 41). Iron blades of the sword, knife, dagger and spearhead are noted to be put in the furnace and subsequently dipped in water (BM 84_a; below). Against the Roman requirement to provide the army with weapons in wartime, Jewish religious rulings prohibited a Jewish-Roman trade of dangerous objects. One reads in the *Mishnah* that

> It is forbidden to sell them bears and lions **or any thing which may cause harm to the public** (AZ 1.7 – Kehati ed.).

From the ending of the phrase, commentators deduced that the ban covers the selling of 'weapons, sword or spears, since they are suspected of using these to the detriment of other people' (*ibid.*,). This is more clearly expressed in the parallel discussion of the *Tosefta*

> 'They do not sell them either an arm or the paraphernalia of arms. And they do not polish an arm for them. And they do not sell them...shackles, or collars (neck-chains) or iron chains...' (T AZ 2.4).[1]

But the ban appears to be even more comprehensive as it prohibited a Jewish trade of metal working tools with the Romans: 'they do not sell them anvils' (*ibid.*). Metal, though certainly the main raw material for weapons production was evidently not the sole source. It is interesting to learn that in the eyes of some of the Sages even mounts have been regarded as a sort of weapon

> Ben-Peteru permits [to sell] in the case of a horse, which does not perform any sort of labor on the Sabbath on account of which they are liable to a sin-offering. But Rabbi **prohibits** doing so on two counts: **on the count of not selling to them weapon of war**, and on the count of not selling them a large beast (T AZ 2.3).[2]

[1] My translation.
[2] My translation.

Urban production did not require much in terms of equipment and space; hence its identification in archaeological excavations is a rather elusive matter (Allason-Jones and Dungworth 1997, 329). Nonetheless, it seems that urban metal production was located in artisans shops located in the markets or city centres. It was suggested that a commercial production of armour might have taken place in Dura-Europos's *agora* (James 2004, 255). Such a shop, in which equipment was sold, had been found in Mamilla, Jerusalem (Maeir 1993; Maeir and Ponting 1996). The shop that came to ruins in 614AD contained six swords and five *umbones* which were piled one upon the other. Coulston notes the existence in the Roman east of an intermediate agent between the craftsman and the soldier, known as the *negotiatores* (1985, 257).

Evidence for Roman metal production in Palestine is still scant. Ponting identified the employment of local copper-alloy in the production of brass (2002b, 6). This observation seemingly indicates local Roman production. The sliding attachment device of the '*lorica segmentata*', as well as the unique riveted tie-hook type from Gamala appears to reflect a non-institutionalized Roman production, although possibly belonging to a 'western' legion – *V Macedonica*. Permanent army bases are still to be excavated. Still, scarps of copper-alloy and lead residues that were discovered in a dump, near Camp F at Masada, indicate a certain degree of production in the field that involved most likely repairs. The remains include among others copper-alloy bands that exhibit clear cutting marks (**PL. III.20D: 3**).

Ballista balls were evidently shaped in the field by Roman artillerymen from local materials, gathered in the immediate vicinity of the besieged city (Stiebel 2003a, 220). Whereas basalt was used at Gamala (Gutman 1994, 95), it was the local limestone in Jerusalem, Masada, Jotapata and Herodium that was employed. Roth estimated a reserve of 20 stones per artillery machine, an overall load of 2.5 metric tones that consisted part of the legion train (Roth 1999, 84). It seems that this figure is overstated, particularly in provinces like Judaea, where stones are abundant and production was preferable at the site as it would have radically reduced the weight of the supply train. In addition, if it was customary for the legion to carry stone ammunition, I would not expect the legion to leave numerous stones behind as clearly apparent at Gamala (Gutman 1994, 98, photo on p. 38). It does seem reasonable that an advancing Roman force carried a minimum amount of stone ammunition though little did the army employ *ballistae* on the open battlefield. Roman craftsmen used a hammer and a chisel to shape the balls. On the surfaces of many *ballista* balls from Herodium, clear working signs of a chisel (five teeth) are visible. Arabic stoneworkers use to date the *tumba* – a toothed chisel for the shaping of corners (Kroyanker 1985, 386, 390). In the case of shaping balls from softer limestone (like in Herodium), the use of a toothed hammer – *matabe* (*ibid.*, 386, 389) would have been less practical as stone dust would have soon filled the cavities between the teeth of the hammer (Stiebel 2003a, 220, Fig. 4).

(c) Transfer of militaria

Not only raw-materials have been brought to Palestine from outside provinces. Metallurgical tests of copper-alloyed *militaria* finds from Masada detected similar compositions between western and eastern Roman fittings. The analysis of copper-alloy equipment from Masada and Gamala suggested that brass was imported to Palestine (Ponting and Segal 1998, 118; Ponting 2002a, 569). This was apparently a gradual process. The hammered brass scales from Masada (Types 1a-b), which appear to be Herodian in date (p. 33), differ in composition from the Roman brasses of the First Revolt (Ponting 2002a, 564). This type of brass-scale lasted until the First Revolt (found at Gamala and Kalandia). During the First Revolt and subsequently a distinct typological change is noticed by the appearance of more 'standard' Roman equipment – like legionary equipment (for example the '*lorica segmentata*'). This shift presumably reflects the now permanent stationing of a Roman legion (*X Fretensis*) in the Province of Judaea; a trend that is further reinforced by the transition of a second Legion (*VI Ferrata*) during the early 2nd century AD. These legions brought with them traditions of production, craftsmen and more significantly a common taste. One outcome of the rather rapid transfer of soldiers and units within the body of the empire was the transition of fashions as well. Thus, it is not surprising to find compositional similarities between equipment uncovered in western and eastern provinces. Still, drawing social conclusions based on metallurgical tests and typology may not entirely reflect the circumstances that are responsible for these similarities. Take for example the concept of imported *militaria*. It does seem that the use of the term 'import' in its modern sense is somewhat misleading, being too general and not necessarily reflecting the processes which resulted in the appearance of *militaria* in a given province. Morphological resemblance like that of the Coolus specimens from Gamala (III.3/A.1) and Schaan (LI), presumably suggests a common place of origin, although the exact mechanism of transfer is unclear. One can only speculate about the way a *sagum* of Gallic manufacture arrived at Masada (*Masada* IV, 197-198, No. 69(L)). Weapons trade clearly involved the participation of varied agents. The introduction of equipment into the archaeological record could have been the result of units shifting, personal acquisition of weapons and even gifts between soldiers and family members or comrades. However, there is direct evidence for import per-se, like the organised shipment of cloaks from Egypt to Judaea (P. Ryl. II, 189). It is clear that the Roman army served as a dominant economic body which introduced new techniques and tastes into the provinces it was stationed in.

More complicated to demonstrate is the intentional transfer of foreign equipment into a local arsenal. Although, the Nabataeans are claimed to have imported most of their *militaria* (Hammond 1973, 71), this may only be true concerning certain raw materials and partly

reflecting the adoption of foreign designs (p. 114). As partly demonstrated in Part II, traditional weapons like the targe (p. 83ff), archery equipment, sling and camel have been much at home there and were rather 'exported', so to speak, to other peoples. In the case of military equipment the blurring of cultural and political boundaries is very common (James 2004, 244). The fact that martial culture is one of the most imitative human activities sometimes resulted in the transfer of designs over tremendous distances, as exemplified by the case of *gladius Hispaniensis* (Stiebel 2004a). The rate of change or spread of designs may be deduced through morphological analysis. A fine example of this is the hasty adaptation of strengthening bars upon Roman helmets during the Dacian wars that by the next three decades became the standard as attested by the Hebron hoard. However, one should be cautious as the limited appearance of certain designs of weapon does not necessarily reflect its adoption and might have been the result of a one-time occurrence, best demonstrated by the 4th century BC *pila* from Palestine which reappear in the country's record only after three more centuries (pp. 142-144).

(d) Loot and booty

Booty has been an important element in the aftermath of war, constituting one of the most significant and desirable profits. Recent analysis of conflict landscapes has demonstrated the prominent place of despoiling activity and illustrated its effect upon post-depositional processes (review: Coulston 2001, 28-31). The War Scroll notes a unit of 'those that despoil the slain' (1QM, VII.3), the members of which were 25-30 years old (Yadin 1962, 153-154). In a symbolic act Judaeus Maccabaeus took the sword of Appolonius and made it his (1 Macc 3.12; *AJ* 12.287), an act which presumably had also practical aspects in light of the grave lack of equipment of the Jewish army. The pressure of being short of supply is similarly attested in the First Revolt, and we witness the phenomenon of arms looting in the Roman period as well. Ironically, part of this deficiency in equipment may be attributed to the release of Jews from compulsory military service, awarded by Julius Caesar stating that 'no one, neither president, nor lieutenant, nor ambassador, raise auxiliaries within the bounds of Judea' (*ibid.*, 14.204). Not serving in the army the Jews inevitably drew away from military affairs, and from arms attainment, unlike the inhabitants of the gentile cities of Palestine, like Caesarea and Sebaste. The initial stage of the revolt found the rebels doing the utmost to take control of the province's armouries (below). During the rage of battle at Gamala, the defenders seized the swords of the wounded and dead Roman assailants (*BJ* 4.27). The hoard from the Hebron vicinity (below) seemingly represents the concealment of looted Roman arms (for stripping and looting in the west – Bishop 1989b, 4-5). In document Heb. 51, the commanders of 'Ein-Gedi are asked, presumably by Bar-Kosiba, to send items 'that belonged to the Romans' (lit. gentiles), seemingly looted. Although the document is

much damaged, one of the legible items is iron (הפרזל). If this reading is correct it may be relating to (looted) weapons, as the use of the term iron to designate arms is very common. Naturally, looting was applicable to other aspects of the military material culture as well. The ritual vessels of a Roman auxiliary unit were looted and concealed in the Cave of Letters (V.23/T.1). Coins were seized from Roman soldiers and deposited in the Cave of Sandal (Eshel and Zissu 1994), while the same origin may be attributed to a silver pendant from Horvat Midras (V.12/T.1), a mirror and a *strigilis* from Horvat Moran (Zissu, Ganor and Farhi 2001, 57-63). Bar-Kochva noted the military codex of Philip the 5th (Feyel 1935, 31, ll. 1-10) as a source for the managing of the booty and the manner in which looting was to be prevented (Bar-Kochva 1980, 208, note 18; Pritchett 1991, 68ff). Indeed, unrestrained scavenging bore with it potential hazardous consequences (Plut. *Vit. Luc.* 4; Polyb. 5.48.1-3), from which Judaeus Maccabaeus warned off his army (1 Macc 4.17).

The evident Jewish technological inferiority compared with the sophisticated Roman technology of siege machinery initiated unconventional solutions. The seizing of 'hi-tech' equipment, and not less important, the operating staff proved to be very fruitful. Torsion artillery machinery became available from the seized baggage train of the retreating force of Cestius Gallus (*BJ* 2.546; Shatzman 1989, 470), as well as from the garrison of the Antonia (*BJ* 2.430). It was thereafter operated by the rebels according to instruction received from Roman deserters (*BJ* 5.267-268; Shatzman 1989, 472). 'In Jerusalem', Josephus further writes, 'Ananus the high-priest and all the leading men who were not pro-Romans busied themselves with the repair of the walls and the accumulation of engines of war (*πολλὰ τῶν πολεμιστηρίων*)' (*BJ* 2.648). Considering its tactical importance, rarity and complex operation, it is not surprising that leaders were responsible for the more sophisticated equipment. As frequently occur among ideological militia bodies, the very tense relations between the different Jewish rebelling parties could have generated an additional source of arms, robbing other parties (*ibid.*, 4.402ff).

Souvenirs

An additional source to consider is souvenir taking. Although at this stage of research one cannot point out a specific piece of equipment that falls under this category, other material culture objects suggest this practice probably existed (although see: *ibid.*, 2.576). A coin of Bar-Kokhba was reported from the cremation burial of a Roman soldier at Brigetio (HU) (Biro-Sey 1977, 47, No. 226). More such coins seemingly occur in several more localities in Hungary still unpublished (Hanan Eshel, *pers. comm.*). The common explanation for this find is souvenir taking. The discoveries of three coins of Bar-Kokhba in the excavations of Jerusalem (Ariel 1982, 293-294), and the single coin from Caesarea Maritima (Zissu and Eshel 2000-2, 160, note 24), were similarly interpreted. A single coin from the

First Revolt was found at Camp F_1 (Goldfus and Arubas 2002, 207). Found embedded in the floor of one of the tents, it was hidden under a large cooking pot sherd, possibly as a charm. In due time, one might be able to determine that a specific arm was taken as a memento.

(e) Reuse and recycling

Much equipment was acquired through the gathering and reuse of material, some of which was of some age. As noted above, it is very common among armies throughout history to strip the dead and to gather missiles from the field of battle for reuse or re-forging (Bishop and Coulston 1993, 34). At times, the gathering occurred during battle (Livy 10.29). The bent tips and tangs of the arrowheads found in the arsenal of arrowheads in Nahal Se'elim (V.27/I) and in Nahal David (V.21/I), clearly indicate the gathering of shot arrows for future employment (Stiebel 2004b, 123; for desert stashes – below). In a like manner, the shafted weapon that was found at the Figs Caves (V.19/H.1) presents a field modification; the head of this was initially gathered in one of the battlefields of the Second Revolt to be reused in the improvised construction of a shafted weapon.

The planning of the design of Roman *pilum* was well-thought out, intended to be gathered and mended following the battle. The deliberately weak construction of the *pila* shaft testifies to the practice of weapons' recovery and reemployment of discarded weapons (Polyb. 6.22). Available equipment, like the rolling stones at Masada and Herodium, which were piled up already in Herod's days, as we have recently proved at Masada, commonly came to use in the subsequent periods (Stiebel 2003a, 219, 220-221). The defenders of Gamala seemingly accumulated *ballistae* balls that were shot by the Romans only to use them as throwing stones (Gutman 1994, 85). Interestingly, we read in the *Midrash* 'and what used Bar Koziba to do? He would catch (lit. received) the [Roman] *ballista* balls on one of his knees and hurled them [back], killing many of the foe' (*Lam R* 2.2.4).

In times of need, even old arms came to be useful. Under this category one may include arms that passed in the family for generations, as an heirloom, or veterans' mementos from previous battles. The army that was raised by Josephus in the Galilee was equipped by *παλαιῶν ὅπλων* that were collected in the district's settlements (*BJ* 2.576). A flat leaf-shaped copper-alloy arrowhead from Kh. Hillel (V.34/I.1) was found stuck to the settlement's wall. It seemingly represents reuse of an old head during the fights that raged in the boundaries of the site in the Second Revolt. A socketed head from the Persian period was uncovered in a refuge cave from that revolt together with iron trilobate heads all of which may be similarly accounted for (VI.2/I.4). We may also note the employment of Herodian arms (a *gladius Hispaniensis* and a copper-alloy arrowhead) by the Jewish rebels at Masada, which seemingly originated in the King's magazines (*ibid.*, 7.299).

The hoard from Hebron retains elements, which were clearly scraps, most notably the cut embossed ear (**PL. V.31C: 1**). Such objects were intended for recycling, a fate that was seemingly designated to the entire artefacts, as being caught with these items would have been a certain death sentence to the owner. Wooden handles of *falces* that were found detached from their metal blades may reflect the recycling of the metal parts in order to supply the weapons industry with iron (Porat and Eshel 2003, 173), possibly reflecting the dire need for raw material. According to the *Mishnah* metal was recycled from wheel tyres, sheet metal and plating, from the utensils' bases, rims and handles (Kel 11.3). It further notes sources for metal as the shavings/chippings (שחלת), scrapings/filling (גרדת), and cut up parts/shattered (קצצת), as well as junk or metal scraps (גרוטים/גרוטי), broken utensils, nails and nails that were produced from [recycled] utensils. Metal scrap or junk was imported into Palestine from abroad (T BM 3.1). In the debris of the fallen walls of storeroom L140 at Masada, a concentration of hundreds of iron nails was found along with an iron hoop, which were seemingly indeed for recycling or reuse. Possibly reflecting dismantling activities that took part during the time of the revolt, and more intensively towards the end of the revolt, it must be stressed that their stratigraphic position appears to suggest a Byzantine date (*Masada* III, 46). The phenomenon of metal scraps and vessel-collecting is well illustrated by a recent discovery in Fatimyte Tiberias (Hirschfeld and Gutfeld 1999; Hirschfeld *et al.* 2000).

(ii) Maintenance

The constant maintenance of equipment forms an important role in the military daily routine regardless of identity, time or place. Maintenance, however, was required not just for functional reasoning, that is the assurance of the effectiveness of the equipment, but as part of a traditional agenda that revered discipline and glamorous appearance. According to the ancient sources soldiers boasted that their shining equipment provided its owner with a tidy and shiny appearance, one that was seemingly much desired by soldiers of the Roman army, as in many other armies (Coulston 1998a, 184). Indeed, the common employment of silver and tin for the plating of varied military fittings appears to accord well with this notion, manifesting a Roman fondness for the shiny look. However, this tendency should not be over-stated, as Bishop has argued, given that in real life a highly polished finish was not necessarily kept up (2002, 85, note 40). Arguably, several factors played a part in the condition of the equipment:

- Climatic and geophysical conditions
- Attrition, battle damage and physical strength of materials
- Quality of craftsmanship

Climatic and geophysical conditions

All components of *militaria* were prone to the ill-effects of the prevailing climatic conditions. Whereas metal weapons and fittings were susceptible to corrosion, a process accelerated by wetness or humidity, organic components suffered from a damp environment. On the other hand, the arid conditions that characterized the eastern and northern African provinces were no less dangerous to the well-being of the equipment, causing the drying up of leather, sinew and wooden elements.

The decisive majority of *militaria* was made of metal, which suffers from corrosion, a coating that forms on its surface when exposed to oxygen. The most widely known corrosion products are the rust ($Fe(OH)_3$) of iron objects, and the encrustation on copper-alloy items (patina). Equipment like mail had to be closely monitored as its exposure to rain, humidity or even the wearer's sweat could have resulted in the flourishing of rust. This was similarly true for the segmental armour, which was regarded as a 'corrosion trap' (Bishop 2002, 86). A famous scene of a river crossing on Trajan's Column shows a soldier that carries his equipment and tunic bundled upon his raised shield (Scene XXVI). It emphasises the measures taken, while wading across bodies of water, in an attempt to avoid contact between the weapons and water. The most common treatment of the surface of metal *militaria* involved polishing. Hellenistic armies were known for their overindulgence in polishing of their panoplies (Bar-Kochva 1979, 99; Plaut. *Mil. Glor.* 1.1-8). In addition to the neat appearance, the gleaming equipment had psychological effect on the enemy (1 Macc 39; Bar-Kochva 1980, 124, 249-250). This appears true for the Roman army as well, although particularly in peace time rather than in war (Plut. *Vit. Luc.* 27.5). It seems that the iron plates of the '*lorica segmentata*' required constant polishing (Bishop 2002, 84-86). In addition, the common plating or tinning of *militaria* presumably had, besides the manifestation of showy appearance, a practical reasoning or benefit of protecting the objects from corrosion. The Coolus type helmet from Gamala (III.3/A.1-2) was tinned, as were the '*lorica segmentata*' plates from Xanten (DE) (Bishop 2002, 80). Although we cannot prove that the plating or tinning was intentionally executed for protective objectives, this added dimension should not be overlooked. The segmental armour, being made of two metals (iron and copper-alloy), was prone to Bimetallic corrosion, which is seemingly responsible for the overrepresentation of copper-alloy fittings in comparison with iron components of the '*lorica segmentata*' (Bishop 2002, 80-81, and note 24; Gamala (graph on p. 35).

The working edges of shafted and edged weapons became blunt during time and were further prone to corrosion. Hence, their maintenance involved two kinds of actions: sharpening and polishing. Honing was needed to remove oxidation products, but also ensured that the edged utensils were sharp and ready for use (T Kel BM 3.10; Kel 14.5), an act that

made use of sharpening stones. This was seemingly true also for missile heads (Jer 46.4).[3] Blades were cleaned by sticking them in the ground (AZ 77_b). It is however important to note that in the ancient world rust also had medical merits. Following a consultation with an oracle, Achilles scraped the rust from his spearhead on to the wound of Telephos in order to hasten its cure.[4]

Climate conditions had a great influence on the completeness and effectiveness of organic components. Exposure to a damp environment might have resulted in the loss of shape and flexibility. According to Livy, humidity should be held liable for damaging the sling (Livy 37.4.41). Similarly, in the production of bows, sinew in particular appears to be sensitive to humidity and temperature variations (Coulston 1985, 253). Polybius described the danger of the rain 'when the leather covering peeled off and rotted owing to the rain, unserviceable as they were before, they now became entirely so' (Polyb. 6.25.7). In the wet Roman west, shield boards were protected by leather coverings that were to be removed prior to the commencement of battle (p. 86ff). Conversely, the hide covers from Masada were an integral element of the shield construction. The paint that decorates the face of the shield seemingly had protective qualities as well. James mentions the employment in Dura-Europos of smearing of wax over the painted board that was intended to protect the decorative images (James 2004, 164). In order to avoid the appearance of cracks in the dry climate of Palestine it would have been required occasionally to anoint the hide cover, as well as other leather components like the internal leathering of the '*lorica segmentata*', with oil. This practice is noted in the Bible (2 Sam 1.21 and Isa 21.5) and later in the *Midrash* (*Mid Ps* 92).[5] Conserving leather components by oiling must have taken place in the Roman army, as it is essential to their preservation, whether the size of a leather tent panel, equine harness, or the internal leathers and laces of the '*lorica segmentata*' (Bishop 2002, 85).

Even more than metal components, parts of an organic nature were vulnerable to attrition. The *Tosefta* discusses armour that has worn out (בלה – *balah*), in all likelihood referring to leather lamellar armour (p. 51).[6] Internal leathers of the '*lorica segmentata*' tended to stretch and weaken (*ibid.*, 81). A solution identified at Gamala for this vulnerability to fatigue was the replacing of these elements by a sliding rivets mechanism (**Pls. III.3L: 2, III.3M: 1**). The geophysical environment, like difficult terrain, in which the soldier operated influenced the lifetime of the *militaria*. Importunate activity, such as marches, would result for example in the wearing of the shoes. The soles of Roman *caligae* have lost numerous

[3] Granite hones were unearthed in the rebels' quarters, Masada (*pers. obser.*); Strageath (UK) (Frere and Roe 1989, 187, Nos. 1-2, Fig. 98 and Pl. XXXIX A).
[4] Ward-Perkins and Claridge 1976, No. 138.
[5] Bishop 2002, 81, 85.
[6] The armour could have been civilian in nature, like the leather strapping that protected the charioteers (Junkelmann 2000c, 92).

hobnails in the rocky terrain of Palestine. At the Roman observation point south of Masada, near camp H, *caligae* nails were found still embedded in the sharp rocks (Benny Arubas, *pers. comm.*).

Attrition, battle damage and material strength

One of the direct implications of the constant use of *militaria* was its attrition. This was a consequence of material strength and the intensiveness of the equipment use. The initial factor reflects the individual strength and the durability characteristics of materials, judged also in terms of time (fatigue). Strength is defined as the ability of a material to resist deformation, or the stress (*i.e.*, amount of energy) required to permanently bend or break a material. It is measured in pascal units (Pa).[7] This stress may be applied in varied ways and directions; commonly push and pull motions. Tensile strength of materials is measured according to several factors that provide the yielded, ultimate and breakage strength of the material.[8] Hence, copper-alloy wires for examples are more likely to fail compared with iron equivalents. In the archaeological repertoire this trait is represent by the common find of isolated scales (pp. 46-47; Croom 2001, 130). A local Roman innovation of riveted tie hoops, of the '*lorica segmentata*', was intended to solve the common problem of deformation. The composite armour further suffered from the fatigue of the internal leathers; hence they were replaced, in the case of L. Magus's cuirass, by sliding rivet mechanism (p. 38).

Unlike metals, materials like plywood can have strength that is very different depending on the direction of the applied stress (frontal *vs.* lateral). In the Roman period this trait was utilised for the construction of durable but relatively light shields (p. 81ff). To enhance the strength of the boards, the plywood layers have been laid in right angle to each other and were provided with frontal and rear leather facings. The outer faces of the '*lorica segmentata*' plates were intentionally manufactured as steely iron while the inner faces are found to be produced with softer ferrite (Bishop 2002, 77; Sim 2000, 40). The shape of the element added much to its strength. The success of the laminated Roman armour was attributed to the curvature shape of its plates which helped to deflect blows (Bishop 2002, 77). This was seemingly the logic behind with the curved design of the scales from 'Azeqa (V.11/B.1; *cf.* Robinson 1975, 154, Pls. 436, 439, 441). Even items produced from thin sheets of relatively soft metal, like brass, could have been shaped in a manner that increased their strength. This was one of the reasons why scales in Roman Palestine were given mid-ribs as a rule (p. 40).

[7] 1 Pascal is equal to 1 newton per square metre.

[8] Yield strength is the stress a material can withstand without permanent deformation. Ultimate strength refers to the maximum stress a material can withstand. Breaking strength defines the stress coordinate on the stress-strain curve at the point of rupture.

Everyday attrition of *militaria*, even without being practiced in battle, was not a theme that soldiers could have overlooked. It was especially relevant to multiple-component gear, such as segmental armour, which was 'maintenance hungry' (Bishop 2002, 84). Although during training the Romans made an effort to avoid injuries and unnecessary attrition by using wooden tipped weapons (Arrian Tact. 34.8, 40.1), it has been demonstrated by modern re-enactors that even simple training practice would have resulted in the damage of shafted weapons as well as protective equipment like shields (Junkelmann 1996, Abb. 131; Griffiths and Sim 1993, 11; Griffiths 1995, 6-7; Croom 2000). Attrition and inflicted damage evidently intensified during battle.

Battle damages are occasionally observed on the faces of military equipment (Bishop 2002, 83), although surprisingly less than would be expected (James 2004, 256). Nevertheless, in the battlefields of Roman Palestine, not a few such examples can bedocumented. The most vivid example is the damaged brow-guard from Gamala that was struck by an edged weapon (**Pls. III.3D, III.3E: 1**). The oblique scar and the swelling of the object indicate that the blow, presumably of an enemy sword, came from the upper left side of the soldier. The plates of L. Magus's armour exhibit further clear dents (**Pls. III.3P: 3-4**) that are compatible with dents observable on armour plates from London and Corbridge (Bishop 2002, Figs. 9.7-8). The up-turned lobate hinge of his armour appears to suggest the fall of the soldier from a high position (**PL. III.3P: 5**), neatly corresponding with the description of the battle. Scales exhibit battle damage, like the example from Kalandia (**PL. III.8: 3**). In addition, we may note a damaged boss from Gamala (**PL. III.3W: 5**) as well as scratched faces of shield boards from Masada (**PL. III.19I: 1**). Sudden and sharp movements, that are typical of hand-to-hand battle, to which the Roman legionary aspired, resulted in the generating of severe stress to the equipment, which caused the detachment and breakage of fittings. Indeed, many of the '*lorica segmentata*' tie-hoops from Gamala were found broken (**Pls. III.3T: 1-6, 8-10, 12, 16; III.3U: 1-5**). The commonest manifestation of battle damage is missile tips and tangs, which are frequently found bent or broken. Indeed, most battlefields of the First and Second Revolts yielded arrows and catapult bolts that exhibited impact signs (Stiebel 2003a, 227-236; Stiebel 2004b, 131-134). Breaks of the wooden fore-shaft just under the iron head are similarly common (**PL. VI.2A: 1**). To these we may add the long shank of the *pilum* from Yoqne'am that was found bent (**PL. II.2: 2**) – a common phenomenon. The routine of missile gathering following training and more importantly on the battlefield, which apparently has been widespread throughout history (above), was intended to retrieve damaged heads and shafts and allow them to be reused, after repair.

Quality of craftsmanship

Bad craftsmanship would presumably affect the rate of the equipment's wear and tear and its life duration. A letter from 2nd century AD Egypt documents the complaints of one Claudius Terentianus to his father about the quality of the supplied equipment (P. Mich. 5390). Then again, the archaeological record retains numerous examples of local and improvised repairs, which have partly to do with the complexity of the multiple-parts equipment that implied their proneness to failure. Such ad hoc solutions do not necessarily represent a poor level of craftsmanship, as the inventive sliding rivet joining apparatus of L. Magus's *lorica* demonstrates. Repairing and replacing of tie-hoops was frequently needed due to loss, attested in their exceptional presentation in the archaeological repertoire (Bishop 2002, 80). Many of the tie-hoops from Gamala exhibit a unique solution that involved the riveting of their loop. The inherent frailty of this multiple-constituent equipment required constant availability of spare-parts. Bishop notes that re-enactors carry spare leather thongs for emergency repairs, which may have been similarly used in antiquity in the field. Could the leather thong, noted in the salary document from Masada (P. Mas. 722) and the one mentioned by Josephus in the list of the Roman soldier's *sarcina* (*BJ* 3.95), be interpreted as a spare element? The daily attrition of scale armour would have implied the casual loss of scales, commonly the dropping off of a line of scales (Croom 1999, 130-132). Unlike the repairing of the ring mail, in this case one need not be an experienced craftsman and the availability of spare scales and fastening wires would have sufficed to patch the damaged *lorica*. Concentrations of spare scales, most likely from the time of Herod, were uncovered at Masada (p. 33).

(a) Repair and improvisation

Constant training and fighting took its toll and thus constant repair was evidently required. The soldier could attend a *fabrica* within the permanent camp (Johnson 1983, 183-188; Bishop 1985b; James 1988). A celebrated example of such a repair system is the hoard found at Corbridge (Allason-Jones and Bishop 1988). Scraps of cut metal recently uncovered in a dump near Camp F at Masada indicate the existence of a workshop or at least the presence of a soldier-craftsman, that was presumably involved presumably with repair and maintenance within the temporary camp (**PL. III.20D: 3**). The diversity of the lobate hinges on the armour of L. Magus strongly suggest the suit underwent at least one repair if not more (**Pls. III.3Q; III.3R: 1-3**). An interesting aspect of the supply and maintenance was the less institutionalised and seemingly rather widespread soldier-craftsmanship (James 2004, 255-256). Finds from Hadrian's wall indicate the existence of limited local production in the beginning of the 3rd century AD (Allason-Jones and Dungworth 1997, 319-320). Simple repairs though have certainly been carried out by the soldiers themselves. An example of this

is the replacement of lost scales, an uncomplicated procedure that could have been accomplished by any soldier.

The use of weapons during training and fighting motivated soldiers to improve their equipment, making it more comfortable, safe, durable and ultimately more effective. It is against this background that one should perceive the sliding apparatus on L. Magus's backplates unit (**Pls. III.3L-M**), as well as the unique feature of riveted tie-hoops, found at Gamala. Improvisations and field modifications are not often detected in the archaeological record. In militia forces, this conduct appears to reflect shortage of supply rather than individual initiative of human engineering. Perhaps the most striking example is the reusing of a Roman catapult in the production of the shafted weapons from the Fig Caves (V.21/H.1).

(iii) Storing

Varied institutions and complexes have been used in Roman Palestine to store weapons. Given the scanty number of excavations of Roman military sites in Palestine, especially permanent bases, not much can be said regarding the *armamentarium* within the Roman camp (Johnson 1983, 108-109, 188-190; Davidson 1989 (i), 148-150). Emphasis is therefore given to the institutions and storing methods that characterized Judaea and to a large extent the Levant. On one hand the official weapon stores or armouries within the local cities, an important Near East institution, and the rural stores. On the other hand the arid areas of the country were inhabited by semi-nomad pastoral communities that exhibit a different solution, in a way that may illuminate conduct in the tents of the Roman temporary camps.

(a) Official and royal weapons stores

According to Josephus Herod had the custody of the weapons of war (*AJ* 14.278). Describing the fortification projects of the King Herod, Shatzman notes that

> '...the fortresses may be divided into two groups. The first comprised those which were meant to establish control over cities, regions and traffic on the roads; their distribution over the whole country achieved effectiveness through the awareness of people to their constant presence. The second consisted of those which were constructed to serve as refuge centres in case the central command might collapse. It included the so called desert-fortresses...' (1991, 275).

Relating to the latter group, it was under the Hasmonaean reign that fortresses were erected along the outskirts of Judaea and Samaria, that is in the Judaean Desert, a tradition which was further practiced under Herod, who invested much effort in the reinforcement and development of these complexes (Netzer 1999; Shatzman 1991, 38-72, 94-97, 275-276, 311-

312).[9] Although some scholars interpreted the fortresses' main function as treasure-holds and administrative centres (Guri-Rimon 1996), this appears not to be the fundamental reasoning behind this system but rather a result of their existence and availability (Shatzman 1991, 94-95).

Herod, writes Josephus, stocked Machaerus 'with abundance of weapons and engines and studied to make every preparation to enable its inmates to defy the longest siege' (*BJ* 7.177). But it is Masada that serves as the 'apogée of this type of fortress' (Shatzman 1991, 276). The site of Masada was designed to serve as a main refuge resort both for Herod, his family, supporters and 10000 soldiers (*BJ* 7.295-303). The site was clearly built to sustain a prolonged siege, but at the same time it was seemingly intended to form a well-stocked base for the launching of counter attacks. The apparent topographical advantages of the site and its remoteness were clearly among the major factors behind the king's decision. The large-scale construction enterprise, which was executed throughout the four decades of his regime, resulted in the erection of a palatial fortress. Special attention was given to the adaptation of the fortress for troubled times. A huge and sophisticated water system was hewn into the north-western slope accompanied by a network of trails that ascended the mountain. The last building phase at Masada, during Herod's days, was mainly dedicated to the construction of a casemate wall and thirty-seven towers that encircled the plateau's perimeter. The north part of the site was occupied by an enormous complex of storerooms, in which food was stocked as well as weapons and raw materials (*ibid.*, 7.299). Indeed, we do appear to have evidence of the whereabouts of the armouries at the site. Netzer suggested that the unique guardroom (L. 179), adjacent the north-western corner of Building 7, was intended to monitor the access to three storerooms (L. 175-177), where some kind of valuable goods was stored, possibly weapons (*Masada* III, 173). During my study of the iron tools of Masada, I have identified two iron pigs, that were found in storeroom 176. If indeed so, they may serve as indicator of the storing of raw material in this area. Further evidence may be gleaned from the nearby unfinished water cistern (L. 162), where a hoard of over 300 spare scales of one type was found dating to Herod's days, possibly originating in these storerooms as well.

In addition to the two groups noted above, at least some of Herod's palaces evidently had wings that served as armouries. One such example was at Sepphoris. Armouries were favourite targets for rebel and enemy forces due to their content. During the unrest that followed the death of Herod, the royal armouries (*βασιλικᾶς ὁπλοθήκᾶς*) in the palace at Sepphoris were seized by Yehuda son of Hezekiah, who distributed the arms among his supporters (*AJ* 17.271; *BJ* 2.56). Indeed, one of the first rebellious acts during the initial

[9] Food storing: Yankelvitz 1983.

stage of the First Revolt was the conquest of Masada. The main object for the attack of this remote fortress appears to be the weapons stored there (*ibid.*, 2.433).

Strategic points, like the Antonia that controlled the Temple compound in Jerusalem, were equipped with technologically advanced weapons. Yet, this superiority could have become a counter-productive in cases where such strongholds fell into the wrong hands. Indeed, following the capture of the Antonia in August AD66 (*ibid.*, 2.430) and the calamity of Cestius Gallus's campaign, artillery machines came into the possession of the rebels (*ibid.*, 2.553). Moreover, information that was received from deserters enabled them to effectively operate the machines against the Romans (*ibid.*, 5.267-268).[10]

(b) Rural weapons stores – 'The exterior house'

There are several cases in which armouries were not located in the heart of the fort but rather in a separate structure at its perimeter.[11] The discovery of eight-hundred spearheads at Buch (DE) seems to identify their building of origin as an *armamentarium*. The structure is situated close to the defensive wall of the fort. Johnson included rectangular structures that often flanked the forts' main roads, adjacent to the *Porta Praetoria* and *Porta Decumana*, in this classification (Johnson 1983, 190, 108-109). The locating of arm stores near the city wall is further attested in Roman Palestine.

Jewish sources testify to violence and conditions of insecurity under Roman rule in Palestine. In addition to conflicts with Roman authorities the Jewish population was exposed to bandit attacks. Relations with local the gentile population were tense and clashes were not unknown occurrences (Alon 1975, 82ff, 342-352). As a result, several protective measures were taken by the Jews, among which we may count the supplying of the local Jewish population with weapons

> 'Rabbi Pinhas stated, a ruling said: yes, that all [those] who leave to save [themselves] return to their place, return even with their arms.
> Consider gentiles that came to the little towns near the frontier to take from them even straw [or] even wood, [they] go out at them with arms and [there after] return the arms to its place. [Gentiles that] came to the enclave towns [people] do not go out at them with arms, unless they came to take their lives' (PT, Erub 4 21_c).[12]

[10] These deserters are identified as auxiliary soldiers (Thackeray ed.). Dio mentions Roman soldiers that willingly deserted into the boundaries of Jerusalem (66.5.4).

[11] The exact identification of weapons storerooms within the military camp is subjected to debate (Bishop and Coulston 1993, 199-201). According to epigraphic and historical texts, the stores are usually located adjacent to the *principia* (Le Bohec 1994, 159, note 61).

[12] My translation.

We further read that 'at first they lead the weapons to the house that is [located] next to the wall' (*ibid.*).[13] The term '*beit hitzon*' (בית חיצון = lit. the peripheral house) is interpreted in the rabbinical literature as a settlement's armoury that was placed by the wall. The somewhat close term of '*beit hitzim*' (בית חיצים) was stated by Rashi to be the 'house of arrows'.[14] Such a house had to be guarded, the funding for which was obtain through a specific tax – the *torzina* (טורזינא) (BB 8_a).[15] The tactical reasoning behind this location was seemingly the fact that it was close to the fighting sectors. Josephus mentions storing of munitions in the towers of Jerusalem (*BJ* 7.375). But storing weapons at the periphery of the city was not with out dangers

> '...once came on them the haters [the Romans], they were pushing to take the weapons and they killed those and those more then the haters killed of them. They set up that [from now on] each will take [his arms] to his house' (PT, Erub 4 21_c).[16]

This catastrophe altered the customary practice and thereafter weapons were stored in the citizens' dwellings. It seems that this practice of storing weapons in private residences was prevailing in the East. Josephus notes that in the Mesopotamian city of Neerda (IQ), not a few weapons were kept in doors (*AJ* 18.315). Weapons that were kept in civil hands were used by the Romans as a source of supply. Passing through Syria and Palestine Cassius imposed heavy taxes and collected weapons and soldiers from the countries' cities (*ibid.*, 14.272). The tradition of Imperial armouries being located in the major Eastern cities (Antioch, Damascus, Edessa, Caesarea in Cappadocia, Nicomedia and Sardis), is attested in the late Empire (*Not. Dig. Or.*, 11.18ff; Isaac 1992, 275, note 46; James 1988).

(c) Storing weapons in the camp

As noted above, to date only temporary camps and a limited scale probe at Tel Shalem were carried out, hence I must leave aside the subject of centralised weapon storage within the fort, and concentrate instead upon aspects of equipment storage by the individual soldier and the unit.

Personal gear

In the camp, the soldiers' fighting gear was held in the *arma* – the equipment room in front of the *papiliones* or in front of the living room in the barracks (Davison 1996, 164ff;

[13] My translation.
[14] Numerous arrows were uncovered in a special storeroom and in the barracks at Persepolis (IR) (Schmidt 1957, 97).
[15] Rashi claimed the keeper resided by the gate; *contra*: Krauss 1948, 253.
[16] My translation.

apud 1989; Johnson 1983, 166-176). Harness pendants that were recently unearthed in Camp F_2, Masada, originated in the 'anteroom' space that was constructed in front of the *papiliones*, where they were presumably kept.

Little is known about the furnishing of the barracks, thus not much can be said with certainty about the way the equipment was held (*ibid.*, 179; Davison 1989, 238-239). Modern reconstructions suggest that equipment was either hung or placed on wooden shelves (Connolly 1991a, 13). Thus, a *gladius* sword that was uncovered in a storeroom at Masada (III.19/F.1) apparently fell from shelves, together with the numerous other objects found in its vicinity (*Masada* III, 63). An analysis of the context in which a ring mail shirt from South Shields was uncovered (above the floor) suggested a possible store in the roof space of the barrack (Croom 1997-98, 57). The position in which the mail shirt from Hebron (V.31/B.1) was found, may provide further details concerning the actual placing of the equipment. Discovered folded, it was seemingly placed inside the infantry helmet (Weinberg 1979, 85). The find of iron scales that formed part of shirt's hem, adhering to the crown of the bowl, supports this notion. It is interesting that re-enactment groups use this very method of storage in modern times: 'ring mail can be stored in a number of ways. Experience with replica mail shirts belonging to the re-enactment group *cohors V Gallorum* has shown that it is convenient and easy to store shirts piled in heaps on a shelf, or placed in helmets sat on a shelf...' (Croom 1997-98, 57). There is no reason to dismiss the possibility that Roman soldiers employed this space-saving practice in their barracks. Towards the end of the Roman siege at Jerusalem, a lavish Roman spectacle took place before Jerusalem, in which Titus awarded his soldiers. The soldiers, writes Josephus, 'as was their custom, drew forth their arms from the cases (*θήκαις*) in which till now they had been covered...' (*BJ* 5.350). It seems that Josephus refers to sport equipment, which was used on special occasions. From the following lines it appears that he referred to the cavalry that took pride not in only in their own equipment but also that of their richly caparisoned mounts. These cases were presumably similar to the iron-bound wooden chests that were used within the *sacellum* (Johnson 1983, 114, Figs. 85-86). The celebrated hoard from Corbridge may grant us a plausible image of such a case (Allason-Jones and Bishop 1988, 95-96).[17] If indeed this find does reflect the way segmental armour was stored, the armour was articulated into four component units which were stacked one inside the other (*ibid.*).

Shafted weapons were in all likelihood placed leaning on the walls. A dramatic illustration for this was found in the basement of the house of a priestly family in the Upper City of Jerusalem. A heavy iron spear (III.12/H.1) was discovered *in situ*, still leaning at one

[17] Bishop 2002, 87.

of the room's corners (**PL. III.12B: 3**). Similarly, the shafted weapon from the Figs Caves was uncovered leaning on the cave's wall (**PL. V.19A: 1**).

Lastly, working in close proximity to the enemy required constant wearing of protective gear, as is clearly depicted on Trajan's Column in numerous scenes.[18] The soldiers are shown working clad in their *loricae* with their helmets and shields placed aside and were handy in case of emergency.

In the tent

A local proverb is noted in the *Babylonian Talmud*: 'In the place where the Master hang his arms, that is the hanger [of the tent], there will the shepherd hang his water jar (BM 84 b).[19] The word used for hanger is קולב (*colav*) (*TA* I, 297, note 92). In Arabic كولاب (*coolab*) designates a hook. Interestingly, the term is not found in the biblical and Near Eastern literature. As it occurs in the Talmudic Hebrew, an alternative origin may be put forward, in light of the diffusion of many Greek and Latin words into Hebrew and Arabic during this period. This appears to be the Latin word for nail – *clavus* which phonetically is very close to the term under discussion and its meaning accords well with the Hebrew word.

In any event it was customary to hang implements, like the sword, from the tent's pole (Jud 13.6). Assyrian temporary tents are depicted on siege reliefs in a manner that enables us to see their interiors (Ussishkin 1982, Fig. 73). Indeed, varied tackles appear to hang from a peg that stem from the tent's poles, illustrating the above maxim (PT Taan 19_b d a; Ayalon and Sorek 1990, 53, Fig. 44).

Heavy-duty equipment

Torsion artillery stone balls

Great piles of *ballista* balls are documented as early as the Hellenistic period. Noteworthy are the concentrations in the open area near the storerooms of the Royal armoury of Pergamon (TR) (Szalay and Böhringer 1937), Rhodos (GR) (Laurenzi 1938), Salamis (CY) (Marsden 1973), Carthage (TN) (Rathegen 1909-1911) and Dor (IL) (Shatzman 1995).

The understanding of the concentration of *ballista* balls in casemate 1039 and the adjacent loci (1051-1052) at Masada has been debated over the last decade. Holley argued that is a dumping place which reflects the clearing activities of the Romans following the conquest of the site (Holley 1994, 360-362). Netzer, on the other hand, relying on meticulous stratigraphic analysis, suggested that the balls were originally piled on the roof of Tower 1038, for the employment of an artillery engine, a point from which they were dumped during the dismantling activities of the rebels in the last stage of the siege (Netzer 1989, 311-320;

[18] Scenes XI-XII; XX; LVI; LXVIII; LXVIX; LXXIII(?); XCII; CXXVII; CXXVIII.
[19] Krauss 1923, 243-244.

Shatzman 1989, 474-475). A concentration of 140 balls was uncovered in a hall of the fortress of Machaerus, in all likelihood part of the site's arsenal (*ibid.*, 467; Corbo and Loffreda 1981, 283, Pl. 43, Fig. 22).

Although some stones presumably constituted part of the legion's artillery train (Roth 1999, 84), most of the balls were evidently produced at the site of the siege (Stiebel 2003a, 238). Piles of stones were seemingly located next to the artillery machines that were deployed in front of the besieged city, as was observed at Gamala (Gutman 1994, 98, photo on p. 38).

Slingshots

Concentrations of slingshots were uncovered outside the entrances to several *contubernia* of the Roman garrison in camp F_2 at Masada. These piles illustrate the recommendation of Vegetius that 'round stones' should be 'very carefully collected from rivers...' (4.8). He goes on to say that 'the walls and towers are filled with them, the smallest for casting by sling...' (*ibid.*). During our recent excavations of the area of the Roman breach, a pile of pebbles that were clearly intended to be used as slingshots by the defenders was found in the adjacent casemate room 1007 (**PL. III.19V: 1**; Ussishkin 1982, Figs. 66-67, 75).

(d) Caves and hoards (stashes)

The concealment of weapons in refuge caves and hiding complexes is well attested in the First and most notably during the Second Revolt. These localities were equipped with storage installations, mainly for water and food, but were intended to stash weapons as well. During the course of the First Revolt, Shimeon son of Gioras built a force, that found its base in the village of Nain, a fortified cave cluster (*BJ* 4.510-512; Patrich 1986). The direct archaeological evidence for weapons' storage in a refuge cave was found at Cave 31 in Nahal Se'elim, where an arsenal of dozens of arrows was uncovered (V.28/I). What seems to identify this find with a 'hoard' of stored weapons is first the number of arrows. Additionally, at least part of this assemblage was evidently gathered following its shooting, possibly in one of the nearby fields of conflict (the Roman camp at Ein-Gedi?), as is attested by the bent tips and tangs of several heads. It appears that the arrows were concealed in the cave for future use. A very recent additional find of arrows in Har Yishai Cave (Stiebel 2004b) may be similarly accounted for, although it differs from the arsenal at Nahal Se'elim in the relatively small number of arrow *stele*. We may further note the discovery of the intact javelin that was left behind in AD135 in a very remote and little accessible cave (**PL. V.19A-B**). Even though the celebrated hoard from a cave near Hebron was interpreted as abandoned equipment due to the need to lighten weight (Weinberg 1979, 86), its composition that retains scraps clearly suggests that it was stashed by the rebels, in fear of the Romans, and was possibly intended to be recycled (above).

8. Conclusions and prospect

> '...as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know' (Donald Rumsfeld, US Defense Department briefing, February 12, 2002).

It was known until recent years that we do not know much about military material culture from early Roman Palestine and from the early Roman east. Yet, this thesis was not intended only to fill a void in our knowledge by focusing upon the narrow field of *militaria* studies alone. By reviewing the wider historical and social contexts through the spectacles of military equipment we obtain a tool which extends and improves our understanding of the big picture, namely how the interrelations between the struggling societies were mediated and moulded by social, political and economic conditions and practices. The closing section of the thesis reviews the work in light of the research questions that were specified on pp. 4-8 and further details several research themes that are matters for the future.

(i) *Progress on the research questions*

1. The nature of military equipment of early Roman Palestine

The initial intention of the study was to fill the gap of the previously known unknown subject of *militaria* in early Roman Palestine. In order to fulfil this, I have amassed an extensive assemblage of military equipment from all sites and available collections throughout the country, providing a review of the military artefacts within the site (Volume 2). From the narrow typological point of view this is a first presentation of the equipment of early Roman Judaea. In some aspects the wealth of finds exceeds that of the entire empire, like the 1600 arrowheads from one site alone (Gamala), or the thousands of *ballista* balls from that site and armour scales from Masada. The arid climate, particularly typical of the Judaean Desert, yielded rarely preserved items, like the intact shafted weapon from the Fig Caves, the shield boards from Masada and the rare painted *vagina* and wooden phallus from that site. The large corpus allowed me to reconstruct the images of both Roman soldiers and local *militia* warriors that operated in Roman Palestine (below). I have further presented the deciphering of several long standing questions or erroneous conceptions regarding the actual construction of *militaria*. A prominent example is the function and place of the metal components of the Roman military horned saddle. The detailed discussions of the artefactual data (Chaps. 3-4) focused on the personal panoply and presented the arsenals of both fighting forces. A unique contribution of this study lies in the concentration upon the individual soldier and his equipment. This resolution enabled the illustration of an actual panoply of one L. Magus, a legionary of the *V Macedonica*. However, in addition it further revealed little attested phenomena like hacking and field-modifications. These small details and the relative

resemblance between western and eastern Roman equipment (below) portray a picture of an organised army (Goldsworthy 1996, 284ff) but with a room for personal innovation and local adaptation such as the sliding mechanism of the '*lorica segmentata*' and the riveted tie-hoops attested at Gamala or the shield leather covering from Masada. One of the contributions of *militaria* study is its possible use as a dating tool. For example I may note the debated foundation date of the unexcavated city of Maximianopolis (IL) (Tepper 2000), for which the gathered *militaria* provided the major indications (Stiebel and Tepper, *forthcoming*).

2. Sources for military equipment study

This thesis demonstrated the positive and informative potential of a critical review of the varied available sources: archaeology, the historical and sub-literary sources and even the representational sources, against the background of the study of *militaria*. Although one commonly finds in modern research a negative attitude towards 'narrative archaeology' it appears that the combined approach can create a rather more comprehensive and fuller picture of martial events, ranging from the course of battle, to the reflection of the behaviour of the individual soldier within his group of *commilitones* (James 1999). As a result I was able to comment upon the credibility of Josephus and to depict the realistic background against which his descriptions of the battles and the military organisations were formed. Of particular importance was the native literature which uniquely presented the point of view of the oppressed side (below).

3. Military equipment in context

The fact that most artefacts were uncovered in conflict sites is of major importance. The evident differences in the Jewish defensive strategies between the two revolts and consequently the differentiation in the Roman offensive attitude were reflected in the archaeological study of the conflict land, the spatial distribution of the equipment and seemingly also in its design. The Romans enjoyed their logistical advantages and their superiority in terms of equipment, most notably artillery and siege machinery, while the rebels attempted to utilised their advantage in the knowledge of the country employing guerrilla and LIC tactics. But *militaria* must be reviewed in the specific social contexts that existed in this turbulent land.

4. Identity

The study of *militaria* provides an insight into the societies involved. Weapons have always been an indicator of gender and status, whether within the lines of the fellow-warriors or between the military and civil societies. In the institutionalised forces *militaria* reflects rank, status and seniority. Identity was manifested in diverse materialistic and non-materialistic ways. In as much it signified the individual, *militaria* was further used on a

broader level as an indicator that identified bodies as well as social trends and processes. This social bonding that was manifested through weapons and fittings, dress, badges or ornamentation designs, formed an important factor in the consolidation of the empire in peace time, and also contributed much to the *esprit de corps* in war (Goldsworthy 1996, 252ff). An interesting manifestation of identity is the terminology used to designate weapons reflecting the rate of diffusion and Jewish resistance to Roman cultural globalisation.

5. Regional diversity

A key question was the unity and diversity of the empire. In spite of the similarity to contemporary western equipment, there were clear indications that local eastern designs and material were adopted by the Romans, like the wickerwork shield or the use of ibex bones in the production of bows. Indeed, the popularity of archery and slings as well as that of wooden rod-like weapons reflects a long-lasting tradition of use. Continuing a distinctive production tradition, the native arsenal appears to be a mosaic of anachronistic weapons, local types, adopted designs and improvisations. The historically attested celebrated *sica* was identified for the first time in our corpus. Regionalism is not only expressed in different design schemes but also through the frequency of use. Thus mid-rib scales that are very popular in Palestine are hardly attested in the west. James illustrated the potential of martial material culture to echo cross-border interactions (2004), manifesting the Roman-Sassanian cultural interface in the 3rd century AD. The present thesis that focused upon the provincial level appears to indicate that this process was not less influential within the borders of the empire.

6. Design and change

The large and diverse corpus from Palestine that represent about 200 years, allowed me to present some of the factors and the mechanisms responsible for the change in the design of equipment. In addition to the interrelation and cross-border influences I have noted a long list of factors that influenced the shape of martial material culture. The rate of change that was discussed above serves as a mirror to the local opposition to the globalization process which was given in Judaea a religious ideology. As far as the design *per-se* is concerned I have provided insights into the considerations of human engineering; how to create a more effective weapon, but one that is also comfortable to handle.

7. Technology and production

A complex layout of weapon production in early Roman Palestine may now be drawn. In the Herodian period the local army enjoyed the auspices of the king that provided an organised supply of weapons, with armouries well stocked by both raw materials and arms. As far as local production concerns the 1st century AD seems to present a period of retreat. The Roman auxiliary force presumably depended on the supply from local gentile towns (like

Samaria and Caesarea) alone. The Jewish arsenal during the First Revolt may be described as a combined employment of locally produced weapons, with 'old' and reused equipment at the beginning of the fighting, in addition to looted Roman weapons and operating knowledge that was extracted from prisoners. The arrival of legions in the province and more profoundly the permanent stationing of *X Fretensis* in Judaea following the revolt brought about a new selection of arms and in all likelihood an increasing demand for supply. The legion also had the capability of production even in the field, as the metal scraps from Camp F at Masada testify. During the period between the two revolts the Romans intensified their military grip on Judaea. This period may be regarded as a transitional period. As more soldiers were deployed in the province the demand for arms increased, reaching a climax in the stationing of a second legion – *VI Ferrata*. During this period local producers supplied the army with weapons under strict Roman quality control (Dio 69.12.2). The accumulation of weapons towards the revolt depended on the mending of rejected weapons (*ibid.*) and possibly also upon secret local production. The pressure of the Romans in the advanced stages of the revolt required creative solutions like the use of bone arrowheads or manufacturing hybrid equipment by employing field modification techniques. It appears that several modes of [metal] production co-existed in Roman Palestine. Moreover, Judaea is interesting for it comprised of a multi-cultural society, in which social and partly religious factors played a part in the metal industry and eventually in the production of weapons.

(ii) *Future prospects*

As far as the known unknowns are concerned, there were several themes that drew beyond the scope of the present thesis. Firstly, there is the presentation of the discussions of the omitted categories, the items of which were analysed in the Catalogue Volume: military dress, the soldier's *sarcina*, riding equipment, archery equipment, slings, stones and rolling stones, torsion artillery and siege machinery as well as tents, military musical instruments, *dona militaria*, military ritual equipment and production tools. The analysis of all these subjects is already completed. One of our future challenges is to provide a wider typological context; that is to say to establish the arsenal of weapons that was used in the preceding Hellenistic period, and particularly the military material culture of the Hasmonaean kingdom. Such a project will allow us to identify the roots and mechanisms of change over an extended period of time. The potential of such a project is neatly exemplified by the *gladius Hispaniensis* case (Stiebel 2004a) and the early 4th century *pila* (p. 142). It will be equally important to illustrate the corpus of the subsequent periods of late Roman and Byzantine Palestine, for which several articles have already been published (Stiebel 1997a; *apud* 2003b, *apud* 2003c; Maeir and Ponting 1996).

The visual reconstruction of the participants in the military events discussed above is on its way, tailoring the available data of dress and equipment of both Roman and native warriors. Indeed, the study of military dress at Dura-Europos revealed its significance in revealing symbolic meanings and military ideology within the close organisation of the military society (James 2004).

It should be noted that this is an initial study in Roman Judaea which brings together a hitherto largely unpublished archaeological material. The limitations of length required that the meticulous study of *militaria* within a specific site, in order to gain a better comprehension of its unique conflict environment be left for the future. Such an initial study was the publication of the martial equipment from Herodium that incorporated historical, historigraphical, context and production perspectives on top of the typological study (Stiebel 2003a). It should be noted that several similar studies (Gamala, Masada, Jotapata, Kh. Qumran and Legio) are already underway.

A vast amount of work regarding the technological aspects of *militaria* is required. The employment of recent scientific developments, such as the first use of DNA tests appears to provide useful information. At least one such project which aims to examine the ferrous *militaria* in Palestine is in its early stages.

(iii) Afterword

Beyond the establishment of a new field in the archaeology of Roman Palestine, the artefactual study of its *militaria* appears to illustrate the geo-cultural place of Palestine as a bridge between societies. As much as the martial material culture presented above reflects long lasting local eastern traditions and cross-border influences, when reviewed against the wider social background the thesis uniquely attests the relations between the Roman oppressor and the suppressed native population. This perception corresponds well with the economic importance of the location of the province as a junction between three continents. Yet, at in the very same time this study uncovers some of the complex nuances of the cultural and social resistance to the Romanisation or globalisation trends. The Roman military community of Palestine operated within a permanent hostile population that did not abandoned its dream to regain independence throughout the above discussed 200 years. In face of the subsurface opposition that was manifested by the religious bans and cultural seclusion, it is clear that the Hollywoodian image of the Roman Empire bringing the message of its superior culture to the distant eastern province by the force of its military might is far from compelling. In Judaea it was clearly not a swift cultural *veni, vidi, vici* and as detailed above this resistance was dressed in many forms and manifestations. One should not forget that weapons were not least the tools of the opposition. They served as symbols of independence, victory or resistance for the rebels. In the Jewish collective historical memory

one still finds the metaphorical use of weapons as a symbol of Jewish victory and independence 800 years after the actual occurrences: '...In the streets of Yavnit to announce, that all Greek tongues were severed by the lance' (Elazar HaKalir).[1] In light of this comprehension it seems to me that to a varying degree this kind of resistance, which leaves little artefactual trace, did prevail throughout the Roman Empire among other societies that unfortunately did not possess at that time such a literary tradition as did the Jewish nation.

'Here we close the history, which we promised to relate with perfect accuracy for the information of those who wish to learn how this war was waged by the Romans against the Jews. How it was rendered my readers must be left to judge; but, as concerning truth, I would not hesitate boldly to assert that, throughout the entire narrative, this has been my single aim'

(*BJ* 7.454-455)

[1] My translation.

Abbreviations – Journals, books, papyri collections and institutions

1QM	1Qumran – War Scroll[1]
AA	Antiquités Africaines
AASOR	Annual of the American Schools of Oriental Research
AD	The Assyrian Dictionary of the Oriental Institute of the University of Chicago
AE	L'Année épigraphique, revue des publications épigraphiques relatives à l'antiquité romaine
ADAJ	Annual of the Department of Antiquities of Jordan
AHB	Ancient History Bulletin
AJA	American Journal of Archaeology
AJP	American Journal of Philology
AJPA	American Journal of Physical Anthropology
AK	Antike Kunst
AKorr	Archäologisches Korrespondenzblatt
ANRW	Aufsteig und Niedergang der Römischen Welt
Ant. J.	The Antiquaries Journal, Society of Antiquaries of London
AP	L'Année Philologique
Arch. Anz.	Archäologischer Anzeiger
Arh. vest.	Arheološki vestnik
BAIAS	Bulletin of the Anglo-Israel Archaeological Society
BASOR	Bulletin of the American Schools of Oriental Research
BCA	Bullettino della Commissione Archeologia
BEFEO	Bulletin de l'école Française d'Extrême-Orient
BIES	Bulletin of the Israel Exploration Society (Hebrew)
BY	Ben-Yahuda E., *A Complete Dictionary Of Ancient And Modern Hebrew, Thesaurus Totius Hebraitatis Et Veteris Et Recentioris*, New York, 1960 (Hebrew)
BAR	Biblical Archaeology Review
BCH	Bulletin de Correspondance Hellénique
BJb	Bonner Jahrbücher
BM	British Museum
BRGK	Bericht der Römisch-Germaischen Kommission

[1] Known also as the 'Scroll of the Sons of Light against the Sons of Darkness' and the 'War Rule'.

CA	Current Archaeology
CAH	*Cambridge Ancient History*
CEA	*Cambridge Encyclopaedia of Archaeology*, Cambridge, 1980
CIJ	Frey J.B., *Corpus Inscriptionum Judaicarum II*, Rome, 1952
CIL	*Corpus Inscriptionum Latinarum*
CornPomp	Cronache Pompeiane
CPL	*Corpus Papyrorum Latinarum*, Cavenaile R. (ed.), Wiesbaden, 1958
D&S	Daremberg Ch., Saglio E., Pottier E. and Lafaye G., *Dictionnaire des antiquités grecques et romaines, d'après les textes et les monuments, contenant l'explication des termes qui se rapportent aux moeurs, aux institutions, à la religion, et en général à la vie publique et privée des anciens*, Paris, 1877-1919.
DJD II	Benoit P., Milik J.T. and de Vaux R., *Les Grottes de Murabba'ât*, Discoveries in the Judaean Desert II, Oxford, 1961
DJD III	Baillet M., Milik J.T. and de Vaux R., *Les 'Petites Grottes' de Qumran, Exploration de la falaise les grottes 2Q, 3Q, 5Q, 6Q, 7Q à 10Q le rouleau de Cuivre*, Discoveries in the Judaean Desert III, Oxford, 1962
DSD	Dead Sea Discoveries
EH	*Encyclopaedia Hebraica* (Hebrew)
EI	Eretz Israel
ESI	Excavations and Surveys in Israel
Forbes VIII	Forbes R.J., *Studies in Ancient Technology* VIII, Leiden, 1964
HA	Hadashot Arkheologiyot (Hebrew)
HTR	Harvard Theological Review
HU	Hebrew University
HUCA	Hebrew Union College Annual
IAA	Israeli Antiquities Authority
IAMS	Institute for Archaeo-Metallurgical Studies
IEJ	Israel Exploration Journal
IJHA	International Journal of Historical Archaeology
IJNA	International Journal of Nautical Archaeology
ILLRP	Degrassi E., *Inscriptiones Latinae Liberae Rei Publicae* (*ILLRP*), Frienze, 1957-1963
ILS	Dessau H., *Inscriptiones Latinae Selectae*, Berlin, 1892-1916
IM	Israel Museum
IMTA	International Military Testing Association

IMSA	Israel Museum Studies in Archaeology
INJ	Israel Numismatic Journal
INNPPA	Israel Nature and National Parks Protection Authority
JA	Jewish Art
JAK	Jahresberichte aus Augst und Kaiseraugst
JAOS	Journal of the American Oriental Society
JAS	Journal of Archaeological Science
JBL	Journal of Biblical Literature
Jericho I	Netzer E., *Hasmonean and Herodian Palaces at Jericho, Final Reports of the 1973-1987 Excavations, Vol. I: Stratigraphy and Architecture*, Jerusalem, 2001
Jericho II	Netzer E., *Hasmonean and Herodian Palaces at Jericho, Final Reports of the 1973-1987 Excavations, Vol. II: Stratigraphy and Architecture*, Jerusalem, 2004
JGpV	Jahresbericht Gesellschaft pro Vindonissa
JJS	Journal of Jewish Studies
JPS	Jewish Publication Society
JQR	The Jewish Quarterly Review
JRA	Journal of Roman Archaeology
JRGZM	Jahresbuch des Römische-Germanischen Zentralmuseums Mainz
JRMES	Journal of Roman Military Equipment Studies
JRS	Journal of Roman Studies
Kh.	Khirbe ('ruins' in Arabic)
KJ	Kölner Jahrbuch
LA	Liber Annuus Studii Biblici Franciscani
LD	Lewis Ch.T., *A Latin Dictionary*, Oxford, 1890
Lehn. II	Krauss S., *Griechische und lateinische Lehnwörter im Talmud, Midrasch und Targum II*, Berlin, 1899
LM	Landesmuseum Mainz
LS	Lewis C.T. and Short C., *A Latin Dictionary*, Oxford, 1890
LSJ	Liddell H.G. and Scott R., *A Greek-English Lexicon*, revised and augmented throughout by Sir Henry Stuart Jones, with the assistance of Roderick McKenzie, Oxford, 1940
LIMC	*Lexicon Iconographicum Mythologiae Classicae*, Zürich-München, 1981-1991

Masada I	Yadin Y. and Naveh J., *The Aramaic and Hebrew ostraca and jar inscriptions*, Masada I, The Yigael Yadin Excavations 1963-1965 Final Reports, Jerusalem, 1989
Masada II	Cotton H.M. and Geiger J., *The Latin and Greek Documents*, Masada II, The Yigael Yadin Excavations 1963-1965 Final Reports (with a contribution by J.D. Thomas), Jerusalem, 1989
Masada III	Netzer E., *The Buildings, Stratigraphy and Architecture*, Masada III, The Yigael Yadin Excavations 1963-1965 Final Reports, Jerusalem, 1991
Masada IV	Masada IV, The Yigael Yadin Excavations 1963-1965 Final Reports, Jerusalem, 1994
Masada V	Foerster G., *Art and Architecture*, Masada V, The Yigael Yadin Excavations 1963-1965 Final Reports, Jerusalem, 1995
MBV	Münchner Beiträge zur Vor-und Frühgeschichte
Megiddo II	Loud G., *Megiddo: Seasons of 1935-39*, Megiddo II, Chicago, 1948.
MemAntFr	Mémoires de la Société nationale des antiquaires de France
MHQ	The Military History Quarterly
MI	Military Illustrated
Middle Liddell	Liddell H.G. and Scott R., *An Intermediate Greek-English Lexicon*, Oxford, 1899
MZ	Mainzer Zeitschrift
NA	Nassauische Annalen – Jahrbuch des Vereins für nassauische Altertumskunde und Geschichtsforschung
NEAEHL I-IV	Stern E. (ed.), *The New Encyclopaedia of Archaeological Excavations in the Holy Land*, Jerusalem, 1992
NHM	Naturhistorische Museum, Vienna
Not. Dig. Or.	*Notitia Dignitatum omnium tam civilium quam militarium in pratibus Orientis*
Not. Dig. Occ.	*Notitia Dignitatum omnium tam civilium quam militarium in pratibus Occidentis*
NT	New Testament
NZ	Niqrot Zurim, Journal of Israel Cave Research Center (I.C.R.C.) (Hebrew)
OED	Oxford English Dictionary
OGIS	W. Dittenberger, *Orientis Graeci inscriptiones selectae*, Leipzig, 1903-1905
OM	Ouheidkundige Mededelingen
ORL	Der obergermanisch-raetische Limes des Römerreiches
P. Dur.	Dura-Europos Papyri

P. Gen. Lat.	Nicole J. and Morel C., *Archives militaires du ler siècle, Texte inedite du Papyrus Latin de Genève No. 1*, Geneva, 1900
P. Hev.	Nahal Hever Papyri
P. Mas.	Masada Papyri
P. Ryl. II	de M. Johnson J., Martin V. and Hunt A. S. (eds.), *Catalogue of the Greek and Latin papyri in the John Rylands Library at Manchester* II, *Documents of the Ptolemaic and Roman periods (no. 62-456)*, Manchester, 1915
P. Mich.	Michigan Papyri
P. Mur.	Wadi Murabba'ât Papyri
P. Se'el.	Nahal Se'elim Papyri
PAM	Palestine Archaeological Museum (to day: Rockefeller Museum)
PBSR	Papers of the British School at Rome
PEF	Palestine Exploration Fund
PEFQS	Palestine Exploration Fund Quarterly Statement
PEQ	Palestine Exploration Quarterly
PJB	Palästina Jahrbuch
PPUAES II	Publications of the Princeton University Archaeological Expedition to Syria, in 1904-1905: Division II: Section A: Northern Syria: 1-7, Chicago, 1919.
PSAS	Proceedings of the Society of Antiquaries of Scotland
QDAP	Quarterly of the Department of Antiquities in Palestine
RA	Revue Archéologique
RAF	The British Royal Air Force
RB	Revue biblique
RE	Wissowa G. and Kroll W. (eds.), *Pauly's Real-Encyclopädie der classischen Alterthumswissenschaft*, Stuttgart
RIB	The Roman Inscriptions of Britain
RLM	Reinisches Landesmuseum
RLÖ	Die Römische Limes in Österreich
RMD III	Roxan M. (ed.), *Roman Military Diplomas*, Vol. III, London, 1994
ROM	The Royal Ontario Museum
RSF	Rivista di Studi Fenici
SA	Scientific American
SCI	Scripta Classica Israelica
Seder Olam R	*Seder Olam Rabbah*
SIG^3	Dittenberger W., *Sylloge inscriptionum graecarum* (3rd ed.), Leipzig, 1915-1924

SJ	*Saalburg-Jahrbuch*
SP	Hunt A.S. and Edgar C.C. (eds.), *Select Papyri: Non-literary Papyri* (2 Vols.), Cambridge (Mass.), 1932-1934
Sun-Tzu	Sun-Tzu, *Art of War*, in: Sun-Tzu and Sun Pin, *The Complete Art of War*, trans. Sawyer R.D., 1996
SWP I	Conder C. and Kitchner H., *The Survey of Western Palestine I*, London, 1881
TA	*Tel Aviv*
TA I	Krauss S., *Talmudische Archäologie* I, Leipzig, 1910
TA II	Krauss S., *Talmudische Archäologie* II, Leipzig, 1911
TA III	Krauss S., *Talmudische Archäologie* III, Leipzig, 1912
Tab. Vindol. II	Bowman A.K. and Thomas J.D., *The Vindolanda writing-tablets (Tabulae Vindolandenses II)*, London 1994
TIRIP	Tsafrir Y., Di Segni L. and Green J., *Tabula Imperii Romani, Iudaea · Palestina, Eretz Israel in the Hellenistic, Roman and Byzantine Periods*, Jerusalem, 1994
TLMAS	Transaction of the London and Middlesex Archaeology Society
TCWAAS	Transaction of the Cumberland and Westmorland Antiquarian and Archaeological Society
VHAD	Vjesnik Hrvatskoga Arheološkoga Društva (Zagreb)
Vindolanda III	van Driel-Murray C. *et al.*, *Vindolanda Vol. III, The Early Forts*, Research Reports, New Series, Hexham, 1993
Vindolanda IV, *fasc.* 1	Birley R., *Vindolanda Vol. IV, The Small finds, fascicule 1, The Weapons*, Research Reports, New Series, 1996
VT	Vetus Testamentum
WCJS	Proceedings of the World Congress of Jewish Studies
ZDPV	Zeitschrift des Deutschen Palästina Vereins
ZHWK	Zeitschrift für historische Waffen- und Kostumkund
ZhW	Zeitschrift für historische Waffenkunde
ZPE	Zeitschrift für Papyrologie und Epigraphik

Abbreviations – Books of the Bible

Gen	Genesis	Josh	Joshua
Ex	Exodus	Judg	Judges
Lev	Leviticus	1 Sam	1 Samuel
Num	Numbers	2 Sam	2 Samuel
Deut	Deuteronomy	1 Kings	

2 Kings		Mal	Malachi
Isa	Isaiah	Ps	Psalms
Jer	Jeremiah	Prov	Proverbs
Ezek	Ezekial	Job	
Hos	Hosea	Song	Song of Songs
Joel		Ruth	
Am	Amos	Lam	Lamentations
Jon	Jonah	Ecc	Ecclesiastes
Mic	Micah	Esth	Esther
Nah	Nahum	Dan	Daniel
Hab	Habakkuk	Ezra	
Zeph	Zephaniah	Neh	Nehemiah
Hag	Haggai	1 Chr	1 Chronicles
Zech	Zechariah	2 Chr	2 Chronicles

Abbreviations – New Testament and Apocrypha

1 Macc	1 Maccabeans	Lk.	Luke
2 Macc	2 Maccabeans	Mt.	Matthew
Acts	Acts of the Apostles	Mk.	Mark
Jn.	John	Rev.	Revelation
Jud.	Judith		

Abbreviations – Rabbinic texts

ADRN	Midrash Avot de-Rabbi Nathan
BT	Babylonian Talmud
Deut R	Midrash Rabbah to Deuteronomy (trans. Rabbinowitz J., in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 7, London and Bournemouth, 1951)
Ecc R	Midrash Rabbah to Ecclesiastes (trans. Cohen A. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 8, London and Bournemouth, 1939)
Esth R	Midrash Rabbah to Esther (trans. Simon M. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 9, London and Bournemouth, 1951)
Ex R	Midrash Rabbah to Exodus (trans. Lehrman S.M. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 3, London and Bournemouth, 1951)
Gen R	Midrash Rabbah to Genesis (trans. Freedman H. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 2:2, London and Bournemouth, 1951)
Jalk	Jalkut Shimeoni

Lam R	Midrash Rabbah to Laminations (trans. Cohen A. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vol. 7, London and Bournemouth, 1951)
Lev R	Midrash Rabbah to Leviticus (trans. Israelstam J. and Slotki J. (eds.), *Midrash Rabbah*, Vol. 4, London and Bournemouth, 1939)
M	Mishnah
Mech RSbY	Mechilatha de-Rabbi Simeon bar Yohai
Mech RY	Mechilatha de-Rabbi Yishmael
Meg Taan	Megilat Taa'nit
Mid Ps	Midrash Psalms
Num R	Midrash Rabbah to Numbers (trans. Slotki J.J. in Freedman H. and Simon M. (eds.), *Midrash Rabbah*, Vols. 5-6, London and Bournemouth, 1939)
Otzar	Otzar Ha'midrashim
Pesikta r	*Pesikta rabbathi*
PT	Palestinian Talmud
Sifra Lev	Sifra Leviticus
Sifra Deut	Sifra Deuteronomy
Sifra Num	Sifra Numbers
Song R	Midrash Rabbah to Song of Song (trans. Simon M. (eds.), *Midrash Rabbah*, Vol. 9, London and Bournemouth, 1951)
Song Zuta	Song of Songs Zuta
T	Tosefta (Zuckermandel M.S. ed., Jerusalem 1970) – unless otherwise noted
Tan	*Midrash Tanhuma*
Trg ShE	*Targum Sheni Ester – The two Targums of Ester*, The Aramaic Bible – Vol. 18, trans. Grossfeld B., Edinburgh, 1991.
Trg	Targum Yerushalmi I
Trg Sam	Targum Samuel

Abbreviations of the tractates of these works are the same throughout. The quotations are distinguished as follows: M is quoted according to chapter and *halachah* (e.g. AZ 1.1), BT according to folio, side a or b (e.g. AZ 2_b); quotations from PT are preceded by PT (e.g. PT AZ 1, 39_a: the first two digits represent the chapter, the third gives the folio and column).

Abot		Ber	Berachot
Arak	Arakhin	Besah	
AZ	Abodah Zarah	Bik	Bikkurim
BB	Baba Batra	BM	Baba Mesia
Bek	Bekhorot	BQ	Baba Qamma

Demai	
Eduy	Eduyot
Erub	Erubin
Git	Gittin
Hag	Hagiga
Hor	Horayot
Hul	Hullin
Kel	Kelim
Ker	Keritot
Ket	Ketubbot
Kil	Kilayim
Maas	Maa'serot
Mak	Makkot
Makh	Makhshirin
MSh	Maa'ser Sheni
Meg	Megillah
Me'ilah	
Men	Menahot
Mid	Middot
Miqw	Miqwaot
MQ	Moed Qatan
Naz	Nazir
Ned	Nedarim
Neg	Negaim
Nid	Niddah
Ohal	Ohalot
Orlah	
Parah	
Peah	
Pes	Pesahim
Qid	Qiddushin
Qin	Qinnim
RH	Rosh ha-Shanah
Sanh	Sanhedrin
Shab	Shabbat
Shebi	Shebiit
Shebu	Shebuot
Sheq	Sheqalim
Sot	Sotah
Suk	Sukkah
Taan	Taa'nit
Tam	Tamid
Tebul	
Tem	Temurot
Ter	Terumot
Uqsin	
Yad	Yadayim
Yeb	Yebamot
Yoma	
Zab	Zabim
Zeb	Zebahim

Abbreviations – Authors of classical antiquity

Aelian *Takt.*	A.M. Devine, 'Aelian, *Taktike (Tactica) theoria*', *Ancient World* 19 (1989), 31-64
Aen. *Tact.*	Aeneas Tacticus, *How to survive under siege*
AJ	Flavius Josephus, *Antiquitates Judaicae*
Amm.	Ammianus Marcellinus
App. *Civ.*	Appian, *The Civil Wars*
App. *Mac.*	Appian, *Macedonian Wars*
Apoll.	Apollodorus of Damascus, *Engines of War*

Apul. *Metam.*	Apuleius, *Metamorphoses* (*Asinus aureus*)
Aristoph. *Nimb.*	Aristophanes, *Nimbus*
Arrian *Anab.*	Arrian, *Anabasis*
Arrian *Epict. diss.*	Arrian, *Epicteti Dissertationes*
Arrian *Tact.*	Arrian, *Ars Tactica*
Athen. *Deipnos.*	Athenaios, *Deipnosophists*
Athen. *Mech.*	Athenaeus, *Mechanicus*
Aul. Gell. *Noc. Att.*	Aulus Gellius, *Noctes Atticae*
BA	[Caesar] *Bellum Africum*
BC	Caesar, *Bellum Civile*
BG	Caesar, *Bellum Gallicum*
BH	[Caesar] *Bellum Hispaniense*
BJ	Flavius Josephus, *Bellum Judaicum*
Celsus	Celsus Tulus Cornelius, *de medicina*
Cicero *De Pro. Cons.*	Cicero, *De Provincilis Consularibus*
Claud. *De hon. Cons.*	Claudianus, *De consulatu Honorii*
Claud. *Bel. Gild.*	Claudianus, *De Bello Gildonico*
Contra Apion	Josephus Flavius, *Contra Apion*
Curt. Ruf. *Hist. Alex.*	Curtius Rufus, *Historiae Alexandri Magni*
Dio	Cassius Dio Cocceianus
Diod. *Hist.*	Diodorus Siculus, *Library of History*
Eusebius-Hieronimus	Eusebius-Hieronimus, *Chronicon*, ed. Helm R. (*GCS*, 47), Berlin, 1956
Eusebius *Kirch.*	Eusebius Werke, *Die Kirchenges*
Eusebius *Praep. Evang.*	Eusebius, *Praeparatio Evangelica*
Eusebius *Vita Const.*	Eusebius, *Vita Constantini*
Festus	Paulus Diaconus, *Sextus Pompeius Festus*
Flaccus	Vallerius Flaccus
Flor. *Hist.*	Lucius Annaeus Florus, *Epitome of Roman History*
Front. *Ep.*	Fronto, *Epistulae*
Frontin. *Strat.*	Frontinus, *Strategemata*
Herod.	Herodotus, *The Histories*
Hippo.	Hippocrates, *On Wounds in the Head*
Homer *Il.*	Homer, *Iliad*
Isid. *Etym.*	Isidorus, *Etymologiae* (*Etymologiarum sive Originum*)
Juv. *Sat.*	Juvenal, *Saturae*

Livy	Livy, *History of Rome*
Luc. *BC*	Lucan, *The Civil War*
Luc. *Herm.*	Lucian, *Hermotimus*
Lucr. *De Re. Nat.*	Lucretius, *De Rerum Natura*
Lyd. *Mag.*	Lydus, *De Magistratibus*
Mart. *Epig.*	Martial, *Epigrammata*
Maur. *Strat.*	Maurice, *Strategikon*
Nat. His.	Plinius, *Natural History*
Onas.	Onasander, *The General*
Oppian	Oppian, *Cynegetica*
Ovid. *Met.*	Ovidius, *Metamorphoses*
Paus.	Pausanias, *The Description of Greece*
Philo, *Belop.*	Philo, *Belopoeika*
Philo *EG*	Philo of Alexandria, *On the Embassy to Gaius*
Pl. *Laws*	Plato, *Laws*
Plaut. *Mil. Glor.*	Plautus, *Miles Gloriosus*
Plut. *Vit. Alex.*	Plutarch, *Vitae, Alexander*
Plut. *Vit. Ant.*	Plutarch, *Vitae, Antonius*
Plut. *Vit. Arat.*	Plutarch, *Vitae Parallelae, Aratus*
Plut. *Vit. Crass.*	Plutarch, *Vitae Parallelae, Crassus*
Plut. *Vit. Cat. Mai., Mi.*	Plutarch, *Vitae Parallelae, Cato Maior, Minor*
Plut. *Vit. Eum.*	Plutarch, *Vitae Parallelae, Eumenes*
Plut. *Vit. Luc.*	Plutarch, *Vitae, Lucullus*
Plut. *Vit. Mar.*	Plutarch, *Vitae, Gaius Marius*
Plut. *Vit. Sull.*	Plutarch, *Vitae Parallelae, Sulla*
Plut. *Vit. G. Gracch.*	Plutarch, *Vitae Parallelae, Gaius Gracchus*
Poll. *Onom.*	Pollux Jullius of Naucratis, *Onomasticon*
Polyaenus, *Strat.*	Polyaenus, *Strategemata*
Polyb.	Polybius, *Histories*
Sall. *Iug.*	Sallaust, *Bellum Iugurthinum*
SHA	*Scriptores Historiae Augustae*
Sid. Apoll., *Epist.*	Sidonius Apollinaris, *Epistulae*
Sil. Ital., *Pun.*	Silius Italicus, *Punica*
Strabo *Geog.*	Strabo, *Geographica*
Suda	Adler A. (ed.), *Suidae lexicon*, Teubner ed., 1928-1938
Suet. *Calig.*	Suetonius, *Gaius Caligula*

Suet. *Iul.*	Suetonius, *Divus Iulius*
Suet. *Tib.*	Suetonius, *Tiberius*
Suet. *Tit.*	Suetonius, *Titus*
Suet. *Ves.*	Suetonius, *Vespasian*
Tac. *Ann.*	Tacitus, *Annals*
Tac. *Germ.*	Tacitus, *Origine et Situ Germanorum Liber*
Tac. *Hist.*	Tacitus, *Histories*
Thuc.	Thucydides
Varro *Rust.*	Varro, *De Re Rustica*
Varro *Ling. Lat.*	Varro, *De Ligua Latina*
Veg.	Vegetius, *Epitoma Rei Militaris*
Veg. *Ars Mulo.*	Vegetius, *Ars Mulomedicinae*
Verg. *Aen.*	Vergilius, *Aeneid*
Verg. *Gerog.*	Vergilius, *Georgics*
Vita	Josephus Flavius, *Vita*
Vitr.	Vitruvius, *De Architectura*
Xen. *Anab.*	Xenophon, *Anabasis*
Xen. *Cyro.*	Xenophon, *Cyropaedia*
Xen. *Hell.*	Xenophon, *Hellenika*
Xen. *Oik.*	Xenophon, *Oikonomikos*
Xen. *Eq.*	Xenophon, *On the Art of Horsemanship*
Zos.	Zosimus, *Historia Nova*

Countries abbreviations

AF	Afghanistan
AT	Austria
BE	Belgium
BG	Bulgaria
CA	Canada
CH	Switzerland
CY	Cypros
DE	Germany
DK	Denmark
DZ	Algeria
EG	Egypt
ES	Spain
FR	France
HU	Hungary
GR	Greece
IL	Israel
IR	Iran
IQ	Iraq
IT	Italy
JO	Jordan
LI	Liechtenstein
LU	Luxemburg
LY	Libya

MA	Morocco	SY	Syria
NL	The Netherlands	TN	Tunisia
PK	Pakistan	TR	Turkey
RO	Romania	YE	Yemen
SD	Sudan	UK	United Kingdom
SI	Slovenia	YU	Yugoslavia (Serbia and Montenegro)

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Appendices

Appendix 1

1.1 – Ancient DNA analysis of organic military equipment

Kahila Bar-Gal Gila[1]

New technologies developed in molecular biology, forensic science and anthropology have demonstrated that it is possible to recover DNA from archaeological specimens and study directly the DNA of ancestral populations (Higuci *et al.*, 1984; Paabo *et al.*, 1989; Woodward *et al.*, 1996). DNA can be extracted from several archaeological sources such as bones, teeth, parchments, skin and leather. The survival of DNA in these sources depends on its state of preservation rather than the chronological age of the specimen (Paabo *et al.*, 1989). DNA contains the genetic information of the organism. This information is coded in genes, and is capable of self-replication. DNA is found in both the nucleus and cellular organelles – the mitochondria – that are found in multiple copies in the cell. The mitochondrial DNA (mtDNA) is a valuable molecule for understanding the evolutionary and genetic relationships among individuals, populations and closely related species (Avise, 1989; Di Rienzo and Wilson, 1991; Irwin *et al.*, 1991; Hoelzer and Melnick, 1994). The mtDNA molecule has a small genome size, simple sequence organisation, maternal inheritance and is effectively haploid in transmission across generations, thus eliminating the complexity added by recombination seen in nuclear DNA (Avise, 1989; Lewin, 1990; Hayes and Harrison, 1992; Meyer, 1994). In addition it is found in high copy numbers, increasing the possibility of recovering mtDNA from museum or archaeological specimens in which DNA may be poorly preserved. Mitochondrial variation is geographically partitioned so that the sequence divergence among mtDNA genotypes from different populations increases as a function of distance or according to the extent of geographical barriers between populations (Avise, 1989; Briscoe *et al.*, 1994).

This new technology of ancient DNA studies was addressed to bone and leather samples from Masada in order to identify the species from which they were made out of. In this study we have studied the DNA found in the mitochondria. We have analysed the DNA of two different regions in the mitochondria, the cytochrome b and the mitochondrial control region (D-loop). Each of them is about 1,100 nucleotides in length. The nucleotides are the molecules, which compose the message of DNA. The cytochrome b gene is species specific

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while the D-loop region can identify species, individuals and closely related individuals such as would be seen in a herd or flock (Irwin, 1991).

The DNA recovered from ancient specimens is fragmented in pieces, each compose of several hundred nucleotides in length. We can devise means of analysing each of the fragments and combining the results to obtain information on the entire sequence. Even the fragmented DNA contains significant information, concerning the unique signature of the individual animal. These samples provide the opportunity of studying the genetic characteristics of ancient organisms and describing individual and population histories.

The major technological advance that has made this study feasible is the polymerase chain reaction (PCR) (Saiki *et al.*, 1988). Starting with the few remaining copies of DNA extracted from the original tissue sample, PCR amplifies specified fragments of DNA up to millions of copies.

In this study DNA was extracted from bone and leather artefacts. The surface layer of the bones ($1cm^2$) was removed by electric drill, using a wide burr. Bone powder was obtained by drilling in a freshly uncovered surface with a sterile small burr. The powder, approximately 0.5-1.0 mg, was collected into a 1.5ml sterile tube. Leather and skins were cut with small delicate scissors or a blade into very small pieces (approximately 0.5-2.0 mg). The small pieces were collected into a 1.5ml sterile tube. DNA was extracted using Guanidine thiocyanate (GuHCL) (Boom *et al.*, 1990) and silica-based purification (Hoss and Paabo, 1993). PCR amplification was performed to the extracted DNA using seven sets of primers, for both mtDNA regions, amplifying each of about 200 base pair long. Applying seven sets of primers increased the chances of amplifying DNA since each set of primers was designed to amplify different areas in the gene. The amplified DNA was sequenced by a direct sequencing reaction using the Termo Sequenase kit, (Amersham), to determine the genetic signature of the sample.

The DNA sequences of the Masada specimens were analysed using the Molecular Biology shortcut program (Rodrigues and Thompson, 1999) to determine of a consensus sequence from each set of primers. The consensus sequences were compared to a database of modern local goat species created by us (Kahila Bar-Gal, 1999) and to caprine sequences in the Gene bank. The comparison was made using the BLASTN program (Altschul *et al.*, 1990). The results of the sequence comparison yielded the genetic variability profile within and between the samples.

In order to confirm that the sequences are of authentic ancient DNA, extreme care was taken to prevent contemporary contamination during the DNA extraction and amplification. All ancient samples were handled, using masks, gloves and laboratory coats. The extraction and amplification of the DNA was carried out in a separate location, under hoods, sterilised

by UV light, using sterile reagents and solutions and disposable filtered tips and tubes in order to prevent contamination. The burrs that were used were cleaned with a brash and burnt before drilling. All the reagents and solutions that were used during the procedure were sterile and kept in the UV irradiated hood.

In every extraction process a blank extraction control and PCR control were included to monitor possible contamination. To confirm the sequences, the complete analysis from extraction to sequencing was carried out at least twice, independently, for each sample. The second procedure was carried out with a period of several months to be sure that it is authentic.

Abbreviations

J Biol Chem	The Journal of biological chemistry
J Clin Microbiol	Journal of clinical microbiology
J Mol Evol	Journal of Molecular Evolution
PNAS	Proceedings of the National Academy of Sciences of the United States of America
Syst Biol	Systematic Biology

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1.2 – Archaeozoology – Gamala's horses

Kolska Horwitz Liora[2]

Partial skeletons of two horses were found on a paved floor in front of the entrance of a structure in Locus 1281, Area B. The walls of the structure were some 1.5 metres apart, and the remains were wedged against the northeastern wall. The deposit in which they were found has been dated to the second half of the 1st century BC.

At least one of the animals lay with its forelegs spread out in front of it, and all limbs from the scapula downwards were present and in articulation (Plate 1). However, the position of the second animal was less clear and bones of the two animals were mixed indicating that they died at the same time. In many instances it was only possible to reconstruct which bones came from which animal back in the laboratory.

Stecher noted that it is common that Arab horses have fewer lumbar vertebrae (5) than other domestic breeds, which usually have 6 (Stecher 1962). However, as illustrated by Clutton-Brock, there is much natural variation between breeds and between animals in this feature such that it is not a sound criterion (Clutton-Brock 1974). The best criteria are withers height and slenderness indices.

For the Gamala material, withers height was calculated from bone length (LI) using Kiesewalters factors as given in von den Driesch and Boessneck (von den Driesch and Boessneck 1974). The similarity of three measurements on different bones indicate that withers height in one animal was 152-153cm, while the other animal was smaller (as shown by two close measurements on two different bones) circa 147-148cm. Payne has noted that for modern horses, animals with a withers height of less than 152.4cm are classified as ponies (Payne 1995).

However, most horses in antiquity were shorter than those today. Based on material from the Roman site of Newstead, Scotland, Hyland concluded that in this period at least two types of horses are found: (1) a broad-limbed, big boned pony with a withers height of 111.7 to 121.9cm and (2) a fine limbed, slender horse. The 'Libyan'/Arabian horses had a withers height of circa 142.2cm while other local English forms were shorter. At this site, some animals had a withers height of 152.4cm (Hyland 1990).

Thus, as noted by Hyland (Hyland 1990, 10), the approximate maximum height of most Roman horses was 152cm (15 hands), which corresponds well to that of the Gamala horses. Similarly, the Arabian-type ancient horses from Egypt/Sudan (withers height given in Table

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1), are markedly shorter than modern animals but on the basis of skeletal morphology and size are clearly horses rather than donkeys.

In addition to withers height, the slenderness index of longbones from Gamala was calculated (Table 2). The Gamala animals are both slightly more robust than the Arabian horses from Buhen and Thebes, but comparable to the specimen from Soleb. They are considerably larger and more robust than donkeys from the site of Gamala.

The animals from Gamala are then probably best described as small horses.

Tables

Table 1: Estimation of withers height (in cms) for different bones in L1281 compared to other loci at Gamala. Formulae used follow von den Driesch and Boessneck (1974) after Kiesewalter. The measurement of LI (in mm) on which the calculation of withers height is based on data given in parenthesis next to the withers height. Withers height is often measured in hands; 101.6 cms = 1 hand

BONES	Gamala Locus 1281	Gamala Other Loci	Buhen*	Soleb*	Thebes*
Radius	(353) 153.2				
Tibia	(350) 152.6				
Metacarpus	(238) 152.5		150	143	136
Metacarpus (right)	(232) 148.7				
Metatarsus (right)		(253) 134			
Metatarsus (left)	(277) 147.6	(240) 127			

* Data from Clutton-Brock 1974

Buhen was a gelding and dates to 1675 BC; Thebes to circa 1975 BC; Soleb, a male horse, dates to the 18th Dynasty.

Table 2 – Slenderness index of the Gamala remains (100 X shaft width/greatest length)

	Gamala L1281	**Donkeys from Gamala Area R**	**Buhen***	**Thebes***	**Soleb***
Radius	45.7x100/358.0 = 12.7				
metatarsus (left)	35.8x100/280.0 = 12.7	28.7x100/240.4 = 11.9			
metatarsus (right)		26.8x100/250.5 = 10.6			
metatarsus (left)		26.9x100/240.5 = 11.1			
metacarpus (left)	39.2x100/240.0 = 16.3		14	13.9	16.1
metacarpus (left)	36.6x100/242.0 = 15.1				
metacarpus (right)	40.6x100/241.0 = 16.8				

* Data from Clutton-Brock 1974.

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1.3 – Materials

(a) Iron (Fe)

Iron (*ferrum*) is a chemical metallic element.[3] Iron deposits are found in Palestine in two forms: Hydrothermal iron (Hematite) in Conmen rocks that is located along Nahal Pharan and Nahal Karkom in the Negev. In addition, Marine iron is found in Oolithic deposits of Lower Cretaceous period, the richest of all is found in Ramim area in the north of Palestine (*EH* 9, 634-635). The recently excavated smithy at Tel Beth-Shemesh (IL), which dates to the 9th century BC, is the earliest yet discovered in the Near East.[4] The whereabouts of the iron mines that supplied the raw material is currently unknown. Smithies were detected at Masada and in Herodium (Stiebel 2003a, 220) and metalwork tools are known from Bethther (**PL. V.6C: A-K**).

Josephus specifies that *ἀργός τε σίδηρον* was stored in Herod's magazines at Masada (*BJ* 7.299). The use of the term *ἀργός* (=shining) clearly points to the storing of worked iron. Two yet unpublished heavy iron lumps, presumably ingots, that were found in Storeroom 176 may have been originally a part of this assemblage. An analysis of the security arrangement leading to this area suggested that this storeroom formed part of the complex in which the arsenal of arms and raw materials were stored (p. 258ff). An analysis of an iron arrowhead from Masada indicates hot forging of bloom iron. The ferrous bloom was of uneven carbon content. A possible source of the added carbon is the numerous walnut's shells that were uncovered in one of the rebels' smithies at the Western Palace of Masada (L442). The sword was produced from a rod of wrought iron of square or rectangular section, which have been forged white hot to the required shape. Following was the hardening of the cutting edges by final hammering.[5] These technical particulars remarkably accord the description found in the War Scroll of the production of the sword's blade and the heavy spear's head: 'ברזל...מלובן כמראת פנים' and 'ברזל לבן מאיר' (V, 10-11; Yadin 1962, 125-126, 136, 283). About the technology of Roman swords: Lang 1988; Bishop and Coulston 1993, 188, 190. For the use of ferrous in the weapon production: Sim 1992 and Sim and Ridge 2002.

One infantry iron helmet and one iron sport helmet are documented in Second Revolt context, in Palestine. Both the forged objects formed part of the hoard from the Hebron district (V.31/A.1-2). A scrap of an additional sport helmet is further included in this group

[3] Atomic number: 26 and its Atomic weight: 55.85.

[4] Excavation of Tel-Aviv University and UCL, under the directory of Dr. Bunimovitz and Dr. Lederman with the collaboration of Prof. Thilo Rehern and Xander Veldhuijzen. For preliminary details see: http://www.tau.ac.il/humanities/archaeology/News/iron-news.htm.

[5] Conservation Laboratory record by Isabel Leon-Gonzalez (Lab No.: 6789; 19/11/1996). I thank Olympia Theofanopoulou (UCL), for providing me this information.

(V.31/A.3). The segmental cuirass known as the '*lorica segmentata*' was produced from sheets of iron that were beaten out the billets (Bishop 2002, 77), examples for which are known from Gamala (III.3/B.1-6). The iron plates were deliberately not hardened, thus attaining 'soft' armour which absorbed the energy of the blow (Williams 1977).

The unique sliding device on the back of L. Magus cuirass consists of flat elongated oval rings were set on the plate replacing the internal leathers. The remains of a laminated thigh guard were found at Gamala (pp. 60-61), consisting of a series of wide overlapping iron plates. Iron scales are reported from Jericho (I.4/B.1-2), Sepphoris (I.6/B.1), Gamala (III.3/B.41-43), Tel 'Azeqa (V.11/B.1) and the Hebron district (V.31/B.2-3). They were all seemingly cut from a sheet of iron and perforated by a punch. The mail shirt found at Hebron was constructed from welded iron rings and an iron fastening device (V.31/B.1). It is possible that the two rows of iron scales found with the shirt were a sort of a terminating hem (*pteruges*). This group of finds included a rare collection of iron infantry and cavalry greaves (V.41/C.1-3 pp. 63-66).

Iron hobnails were fastened to the sole of the Roman military footwear, exhibiting several head designs and sizes (Jericho: (I.4/D.1); Masada (Yadin 1965, 91), Siege camps, Masada (III.20/D; Gutman 1964, 115), Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-3), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26)).

The gripping and reinforcing bars of the shields were made of iron (III.19/E.11; III.3/E.1-2). No iron *umbo* is documented in Roman Palestine, although such are reported from the Byzantine period (Stiebel 2003c, 153, 155-156).

Iron was largely identified with the production of edged arms and Josephus commonly uses the term *σίδηρον* to denote swords (see Appendix 2). A Hellenistic *gladius Hispaniensis* from 2nd century BC Jericho was produced from a rod of wrought iron of square or rectangular section, which has been forged white hot to the required shape. The cutting edges were then hardened by final hammering (Stiebel 2004b).[6] In addition to swords, one may note the local daggers like the *sica* (I.8/F.1) and clasp-knives (pp. 114-115). Iron scabbard are reported from Gamala (III.3/F.11), Masada (III.19/F.1) and 'Ein-Gedi (I.8/F.2).

[6] Conservation Laboratory record by Isabel Leon-Gonzalez (Lab. No. 6789; 19/11/1996). I thank Olympia Theofanopoulou (UCL) for providing me with this information; *cf.* War Scroll V, 10-11 (Yadin 1962, 125-126, 136, 283).

During the Roman period, iron was the favourite metal in the production of missiles. A large variety of arrowheads types is documented, ranging from simple cast flat head to the more complicated trilobate tanged head.

The heads of all shafted arms both Roman and local were made of iron as were the socketed and tanged catapult heads. Heads were cast – Site of 'Bypass Shoham' (V.10/H.1). The metal shank of the *pilum* was designed to bend at impact (II.2/H.1), while the local heavy spear had a massive shank that functioned as a shock weapon (p. 113).

Ferrous metal was amply used in the production of horse equipment: harness's junction rings, girth buckle, bits, spurs and horseshoes (Bishop 1988). Tethering and tent pegs were made of iron although the latter category also includes wood examples. In addition, we may note caltrops (**PL. VI.1: 1**) and iron tyres that sheathed the wooden wheels of Roman chariots and carts.

Iron nails that were found along the outer face of Gamala's wall were interpreted by Gutman as the remains of the Roman assault ladders (Gutman 1994, 87). A unique iron *falx muralis* was found at Gamala (III.3/O.1). Iron-sheets cased the Roman siege towers in order to protect their wooden structure and the soldiers inside them from the foes fire (*BJ* 3.284, 287; 7.309).

(b) Copper alloys

Two centres of copper mining are known in Palestine, at Timna in the southern Arabah (IL) and Feinan/Phaenon (JO). Site 28 in Beer Ora (IL) at the southern end of the Timna valley retains evidence for Roman copper smelting in the 1st-3rd centuries AD (Rothenberg 1990, 54-63). Indeed, According to Hieronimus, copper mining in the southern sites was brought to an end in the 4th century AD (Eusebius-Hieronimus, No. 922).

Recent metallurgical tests of copper-alloy *militaria* from Masada (Ponting and Segal 1998) and Gamala (Ponting 2002a) shed light upon the Roman and local industries and the production relation between the Roman East and West. It appears that several production focuses may be pointed out.

These studies have established similar compositions between Western and Eastern objects. Ponting interpreted this as indicating a uniformity and standardization of the Roman army 'despite the differing origin of the legions involved in suppressing the revolt' (Ponting 2002a, 557). Yet, I have several reservations regarding this conclusion. Firstly, the morphology of the fittings points out variability in the same types, which seems to restrict the asserted uniformity to the technological aspect alone. Hence it appears that such compositional similarities might indicate the sharing of technological knowledge within the army, or the import of the alloys and not the complete product. But more problematic is the

scope of these studies. One of the main conclusions of Ponting's study is the existence of standardization despite the presence of three legions at Gamala of different origin. However, nothing in the analyzed material indicates that it actually originated in the panoplies of three legions. From over-all 20 *militaria* objects sampled from Gamala, 12 are '*lorica segmentata*' tie-hooks. Most of the analyzed tie-hooks derive from one limited area (Area T), thus seemingly reflecting, if we are to trust the historical and epigraphic evidences, one legion alone (*Legio V Macedonica*), but certainly not allowing a comparative study. If indeed the material belonged mainly to a legion that came from Moesia, the resemblance to the material from the West does not reflect any standardization, for it is not clear that this material belonged to an eastern unit. It would be thus interesting to examine the composition of the *lorica* fittings from Masada, which clearly equipped the *Legio X Fretensis*, in comparison with that of Gamala.

The Romans presumably used of local copper-alloys in the production of brass (Ponting 2002b, 6). Still, brass was claimed to be imported to the Levant, as smithsonite is not available in the Middle East (Ponting and Segal 1998, 118; Ponting 2002a, 562-564).

As Ponting demonstrated there are indications for technological differentiations between the pagan and the Jewish metal (copper alloys) products in the Galilee (Ponting 2002b). Such differences, like the deficiency of brass artefacts in Jewish settlements, reflect the cultural 'increasing exclusion of objects with clear Roman association' (*ibid.*, 3). Furthermore, the study points out the different casting traditions as the Pagan used highly leaded bronze which accords well the Late Hellenistic and Roman metal work (*ibid.*, 6). The Jewish approach appears to be akin to the traditional Near Eastern technique which used minimum of lead in casting. In addition the Roman army appear to have recycled local copper (Ponting 2002b, 5).

Copper alloys were amply used in the production of *militaria* (techniques and variety of alloys: Bishop and Coulston 1993, 191). As noted above, χαλκὸς was stored in the magazines of Herod at Masada as raw material for arms production (*BJ* 7.299). Helmet bowls of the Early Principate were produced by spinning technique (Bishop and Coulston 1993, 191) while the cheekpieces were cast (III.3/A.1), forged (III.20/A.1) and embossed (cover – III.19/A.1). Further helmets' copper-alloy fittings are found in the archaeological evidence, like: decorative elements (p. 31), brow-guards (p. 29), ear-protectors (p. 29), crest holders (III.19/A.4) and helmet handles (pp. 30-31). Sport helmet were also manufactured from copper-alloy (pp. 24-26).

Turning to the armour category, copper-alloy elements are most prominently represented in *lorica squamata* cuirasses (p. 40ff). Most of the scales unearthed at Masada were of brass. Copper-alloy scales in Palestine were punched from a cast sheet of metal. The brass sheet was seemingly heated to enable an easier shaping process (Maddin, Muhly and Stech 1983, 109).

A more robust type of local scales (with four upper attachment holes and midrib) was cut from a sheet of metal. A rather rare hybrid form of armour exhibits minute copper-alloy scales that were attached to a mail shirt (pp. 49-50). The laminated armour was equipped with copper-alloy fastening fittings, like tie-hooks and buckles, as well as copper-alloy hinges. Small flat-headed copper-alloy roves fastened the inner leathers, while decorative washers adorned '*lorica segmentata*' plates as well as helmets' cheekpieces. These fittings from the West were produced from *orichalcum* (a type of brass) (Bishop 2002, 77).

The over-representation of tie-hooks in the archaeological record was explained by the bimetallic corrosion (galvanic or electrolytic corrosion: Bishop and Coulston 1993, 35 and note 8; Bishop 2002, 80). The limb-guard category is represented in Israel by terminating plate of an armguard (*manica*) that was found in siege Camp F at Masada (III.20/C.1).

The shield perimeter was commonly bound with copper-alloy U-guttering (p. 90). All three bosses from Palestine are made of copper-alloy (pp. 85-86). The flanges of the two identical circular bosses were decorated by a running embossed dots ornamentation. We may also count decorative dome head pins and name tags (pp. 92, 93ff).

In the construction of the edged arms, copper alloy was little used, but the handle assemblage of the *pugio* (pp. 111-112). Yet, most of the scabbard fittings (p. 117ff) were produced from copper alloy: U-guttering frame, decoration mounts, etc. Copper alloy was employed in the production of belt fittings and buckles (p. 125ff), like buckles, suspension loops, frogs and 'apron' fittings. Few missiles in Palestine were made of copper-alloy. In fact a single arrowhead alone from Masada is not made of iron, as are all the thousands of arrowheads, shafted head examples and artillery heads. This head like two more examples from the Second Revolt (V.34/I.1; VI.2/I.4) were re-use of early Persian heads. Copper-alloy was used for the production of haversack's buckle (**Fig. I.6B: 1, 5**). This applies to most of the harness fittings: pendants, junctions, saddle horns (**PL. VI.IA: 1**), and the *beneficarius* badge from Jerusalem (**PL. VI.3: 3-4**).

(c) Lead (Pb)

The metallic chemical element Lead (*plumbum*) is grey-light blue in colour. The soft metal is heavy and dense with the specific gravity: 11.34.[7] The melting temperature of the lead is 327.4° and it boils in 1740°. Lead was a common component in the production of copper-alloys (Bishop and Coulston 1993, 192-193). Its extraction is unknown in Palestine, and the closest source appears to be Cyprus. A lead ingot was recovered from the Maa'agan Micha'el shipwreck (*c.* 400BC) (Linder 1992, 34 – upper left). Among the raw materials that were stored in Herod's magazines at Masada, Josephus notes the lead (*μόλιβος*) (*BJ* 7.299).

Indeed, in the excavation of Masada several leaden pigs were uncovered. The small-sized objects (100-150mm) have elongated proportions and they are semi-circular in cross-section. Some have been clearly cut by chisels, as their oblique edges indicate.

In Palestine, lead was used in the manufacturing of slingshots (*glandes plumbeae*), particularly during the Hellenistic period but in the early Principate as well, as the examples from the Collections of the Institute of Archaeology, Hebrew University (VI.8/K.1) and Jerusalem (III.12/K.1) testify (Stiebel 1997).[8] Modern experiments have demonstrated that the production process of leaden pellets was very fast and could have taken place in the field as well. In addition to the use of moulds, examples for which are recorded in the Hellenistic world (Empereur 1981, 555, Inv. 732, Fig. 49; Stiebel 1997, 301-302, Fig. 2) it seems as if there were conditions under which a very fast production method was necessitated. The analysis of the shots from Velsen I (NL) exemplified the production possibilities under pressure which required minimum equipment. The four types which Bosman determined were cast into a dent that was pressed into the sea sand. One of the four types was formed by the pressing of a finger (attested by a lead shot in the image of a finger tip). Following the casting the shot was cooled in water and was ready for use. Bosman's Types 3 and 4 under went hammering. The overall production times were very short and were calculated in seconds (Bosman 1995b).

The significant weight of the knobbed terminal of a *gladius*'s scabbard from Nahal Arugot (V.23/F.1) appears to suggest is has a leaden core. Additional leaden element was used during the siege of Jerusalem. From their assault ramps, the Roman engineers used '*μολιβίδι και λίνῳ*' (lead and cord), in order to measure 'the distance to the wall' (*BJ* 5.275). This device was seemingly a sort of leaden plummet that was 'cast from the embankments – the only practicable method for men under fire from above' (*ibid.*). Possibly used in like manner to the sling, the leaden plummet, attached to a long cord, was flung and hurled. Thereafter the cord was presumably measured to provide the necessary data.

(d) Silver, tin and niello

Unlike modern armies that regularly attempt to camouflage the metal parts in order to be less visible to the enemy eye, ancient army boasted of their shiny arms. The defenders of Jotapata were staggered by the sight of the Roman army for 'the mountain-side' was 'gleaming with arms' (*BJ* 3.263). A very similar description narrates the occurrences of the battle at Beit Zechariah (162BC) (1 Macc 6.39; Gera 1996, 27-31).[9] According to Polybius,

[7] Its atomic number is 82, and atomic weight: 207.21.
[8] According to Polybius the Romans were hurling: 'large lumps of lead' (Polyb. 8.5).
[9] For the details of the battle, see: Bar-Kochva 1980, 249-250.

soldiers in the Hellenistic armies used to polish their arms to achieve this intimidating effect (Polyb. 11.1.9-2; *cf.* Plut. *Vit. Eum.* 14; Plut. *Vit. Sull.* 15; Onas. 28-29). The showy appearance of the Roman soldier, of which silver and tin formed a dominant place, was part of his unwritten 'business card' (Coulston 1998a, 190), stating its high-ranking social status.

It seems that the selection of the specific metal (silver or tin) was related to the unit of origin, as harness fittings appears to be usually silvered, while the infantry equipment tends to be rather tinned (Bishop 1988, 115). The limited assemblage from Palestine seems to back this general observation with regard to the cavalry preference. Nevertheless, the artefactual evidence concerning infantry equipment is less conclusive, as the scabbard chape of the legionary L. Magus was silver-plated (III.19/G.1).

Silver (Ag)

Silver (*argentum*) is a chemical metallic element.[10] Livy refers to an allegedly sanitised appearance of the Roman panoply (9.40.4-5). It may be taken as an ideal concept of the Roman command, if not only a literary understated depiction that aims to present diversity between the Samnites warriors and Romans, as part of the Roman propaganda, not necessarily reflecting reality.[11] Indeed, judging from both the historical and archaeological evidences, this notion does not stand. Pliny the Elder noted that silver tabs decorated soldiers' belts (*NH* 33.64.152). Not only did belts have decorative value, but they were also used as a substitute for money (Tac. *Hist.*, 1.57). Silvering involved the soldering of a beaten silver sheet over the object. A distinguished percentage of the silvered militaria relates to the category of either harness or belt fittings. Elder Pliny describes Roman soldiers as follows: 'their scabbards ring with silver links and their belts with silver plates' (*NH* 33.152). Indeed, the tip of the scabbard chape of L. Magus from was silver plated (III.3/F.5), as is a frog from Gamala, while a silver frog was found at Samaria (I.6/G.1) and a silver-plated hinge-mount is recorded in Masada (III.19/G.1). To the initial category we assign a *phalera* from Masada (III.19/Q.4).

Tin (Sn)

The tin (*stannum*) is a chemical metallic element.[12] The Romans referred to the tin as a kind of lead terming it *plumbum candidum* or *plumbum album*. Its origins of supply in the ancient Near East are somewhat ambiguous and it seems that tin may have been imported from Afghanistan (Schneider 1984; Schneider 1982), while during the Roman period,

[10] Atomic number: 74 and its Atomic weight: 107.83.

[11] Still, this description may have in it seeds of truth for most of the legionaries were armed by the dull, unpolished, appearance of the '*lorica segmentata*' (Bishop 2002, 85-86 and note 40), where as the Sarmatians were using mainly scale armour that tend to exhibit a more sparklingly look. Although, evidences for tinned plates are documented in Xanten (*ibid.*, 78, 80).

[12] Atomic number: 50 and its Atomic weight: 118.70; Specific gravity: white tin: 7.31; grey tin 5.75.

evidences exist to the trade of Cornish tin from the *Ictis insula* (Diod. *Hist.*, 5.22.2), identified as St. Michael's Mount, Marazion, Cornwall (UK). Tin formed the most commonly used alloying component in the process of copper-alloy, improving the hardness and casting behaviour.

The cheekpiece and brow-guard from Gamala, for example, were tinned, a process that involved the dipping of the artefacts into molten tin. Although consistently referred to as made of silver (Gutman 1994, 64, 85, 97, 98) or silver-plated (Syon 2002, 145) these parts were evidently tinned (Mathew Ponting, *pers. com.*). Additional merit of the tinning of equipment was rather functional, protecting the metal objects from corrosion. In addition to helmets, armour scales (Masada) and cavalry harness fittings were tinned.

Niello

Niello is a black or blackish-blue composition of lead, silver, copper, sulfur and ammonium chloride (La Niece 1983).[13] Commonly used as a decorative agent, particularly in inlayed ornamentations, the mixture was fused onto an engraved or cut-out metal base by firing the mix. Examining military equipment from Palestine it appears that harness and belt fittings alone are found to be inlayed with niello (decorated dagger scabbard were yet neither unearthed in Palestine nor elsewhere in the East).[14] One such object from Masada (III.19/Q.3) exhibits a dark niello fill, which on the bronze background creates a desirable contrast image of bunch of grapes and tendrils. Niello decorates an additional *phalera* from Masada (III.19/Q.4) and a frog from Legio (V.3/F.1).

(e) Gold (Au)

Gold (*aurum*) is a chemical metallic element.[15] The yellow metal is heavy (specific gravity: 19.3) and soft. In the Near East it was extracted in south Egypt, in Asia Minor and the west coast of Arabia (Forbes VIII, 157-165).

The precious metal was largely used in the production of cult utensils, among which we may count the golden shields and possibly the *imagines* that were entrusted respectively in Herod's Palace and in the Temple at Jerusalem by the Roman governors (Maier 1969; *BJ* 2.169; *AJ* 18.55; Philo *EG* 299-305). Ceremonial gold shields have a long history, which in the Near East dates back to the Biblical period.[16] According to the Greek epic, Hephaistos

[13] The term niello derives from the Latin word *nigellum*, which is the diminutive of *niger* – black.
[14] Niello was used for the pupils of a Moorish cavalry figurine from Jerusalem (Stiebel 1999, 80-81).
[15] Atomic number: 79 and its Atomic weight: 197.0.
[16] Golden shields are noted in the Bible (2 Sam 8.7; 1 Kings 10.16-17; 14.20; 1 Chr 18.7; 2 Chr 9.13, 15-16; 12.9). In the Talmudic and Midrashic literature for example: *Ecc R* 2 (Said R. Yohanan: eighty thousands priest cadets, holding eighty thousands gold shields – G.D.S.); *Otzar* 260, 526; *Jalk* Isa 421; 1 Kings 204; *Tan Be'shalah* 25; *Song Zuta* 7.11.

extensively used gold in the construction of Achilles's shield (Homer *Il.*, 18.478ff., 20.272). The Homeric description came to life in the image of the magnificent ceremonial shield from 'Philip's tomb' at Vergina (GR) (Andronicos 1984, 136-137, 140, Figs. 91-94). Such a shield is further described by Athenaios (Athen. *Deipnos.*, 12.534e). It seems that these Greek examples mark the tradition of ceremonial golden shields' presentation, the descendants of which we meet in the subsequent centuries. According to the letter of a Roman Consul, Lucius (142BC), Simon sent the Romans a gift of a golden shield, in the value of 1000 mna (1 Macc 15.18, 20). The Jewish delegation, which was sent by Hyrcanus to re-establish the treaty with the Romans (134BC), brought a gold shield (*ἀσπίδα χρυσῆν*) as a gift to the Senate, of the value of 50000 pieces of gold (*AJ* 14.147-148).[17] A celebrated occurrence was the granting of a golden *clipeus* to Augustus by the Roman Senate (*Res Gestae* 34.2).[18]

Turning back to the presentation of gold utensils, like the shields and *imagines*, the *Midrash Tanhuma* notes the location of a golden icon, in the image of a king, at the entrance to his palace (*Tan Gen* 7). Preceding the above noted events, was the case of the golden eagle, which Herod placed, in the dusk of his regime, above one gate of the Temple compound, causing a severe agitation among his people (*AJ* 17.151ff; *BJ* 1.650 ff.; 2.5).[19] This occurrence naturally brings to mind the Roman *aquila*, 'the king and bravest of all the birds... symbol of empire, and... omen of victory' (*BJ* 3.123) that was made of gold (Dio 40.18). Gold was intensively used in the making of the military decorations, 'crowns of gold' (*στεφάνους ἐπετίθει χρυσούς = corona aurea*)[20], 'golden neck-chains' (*περιαυχένια τε χρυσά = torques*)[21] and 'golden spears' (*μικρά* or *μακρά δόρατα = hasta pura*?)[22], that were awarded by Titus to his most courageous soldiers in face of Jerusalem's walls (*BJ* 7.14ff).

It is apparent that silvering and tinning were more common techniques than gilding among the lines of the Roman soldiers, possibly due to cost differences. Yet, following a war this state of affairs could have been altered, as a result of the spoils that fell into the hands of the Roman army. Josephus reports that: 'so glutted with plunder were the troops one and all

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[17] A golden vine of 500 talents worth was presented by Aristobolus to the Pompeius (*AJ* 14.34-36). On the golden vine that decorated the Sanctuary portal in Jerusalem: Patrich 1993/94; *BJ* 5.211ff, *AJ* 15.395; Tac. *Hist.* 5.5.

[18] '...a golden shield was placed in the *Curia Julia*: an inscription on the shield testified that the senate and the Roman people gave me this in recognition of my valour, clemency, justice and piety'; *ILS* 82 and *CIL* IX 5811; *cf.* Maxfield 1981, 97; Andronicos 1984, 140.

[19] A coin with eagle motive that was struck by Herod may be an allusion to this event (Meshorer 1997, 65, coins 66). The Slavonic version notes that the eagle was erected 'in honour of the emperor' (Thackeray 1928, 642-643).

[20] Maxfield 1981, 80-81.

[21] *Ibid.*, 86-88.

[22] C. Didius Saturninus was granted spears made of silver by Severus and Caracalla (*CIL* XI 7264); Maxfield 1981, 84-86, especially 86.

that throughout Syria the standard of gold was depreciated to half its former value' (*BJ* 6.317).

Titus was furious with his rioting soldiers, reprimanding them for the blushing of their weapons 'made of silver and **gold**' (*BJ* 5.555). This description resembles Suetonius's account in which he notes that Caesar equipped his soldiers with arms inlayed with silver and gold (Suet. *Iul.* 67.2). The equipment that was on display during the spectacle that took place in face of the Wall of Jerusalem caused 'the area in front of the city' to gleam 'far and wide with silver and gold' (*BJ* 5.351). The *Song of Songs Zuta* (8.14) notes the employment of golden (scale?) armour in Palestine. The common use of precious metals, such as gold and silver, manifests the opulence of the Roman personal gear.

As for *militaria*, two gilded items are documented in Roman Palestine, both relate to the belt category: a frog from Legio (V.3/G.3) and a phalera from Narbata (III.7/G.1). Thin gold foil was applied upon the face of the copper alloy object.[23]

A scabbard-chape from Gamala (III.3/F.10) was mistakenly published as a gilded object (Gutman 1984, 98 and photo on page 97; Syon 2001, 145). Careful examination clarified that no gold was applied and the shinny appearance is a result of an aggressive post-excavation chemical cleaning.

(f) Bone, antler and ivory

Although osteological material is quite available as a raw material, it is clear that a consciousness selection of species and type of bone was made from an early date (Hakker-Orion 1999, 10*-11*). In addition to the import of precious materials like ivory, from Asia and Africa, we witness in Roman Palestine a local hunting of wild animals (*Ibex*) that provided raw material for the archery equipment. Of course, human consumption was an important and accessible source of bones and antler. During the Roman period this material was used in the production of handle assemblages and composite bow components, arrowheads, buckles, frogs (Bishop and Coulston 1993, 193-194) and in the making of scabbard-chapes during the 3rd century AD.[24]

[23] Stucco gilded decorations was discovered at the Late Hellenistic settlement of Tel Anafa (Gordon 1981, 212, 227). Powdered gold was applied on two capitals from Banqueting Hall 1 of the Lower Terrace of the Herodian Northern Palace at Masada (*Masada* V, 112, Pl. XVIa-b; Porat 1995, 224-226, Tables 1-2, sample 1 (N-63)). A complete Corinthian capital from Cyprus that was painted with yellow colour (Netzer 1999, Fig. 93), seemingly represents the same decorative motif, yet in a slightly less wealthy manner. Josephus praises the use of gold in the construction of the Temple's exterior (*BJ* 5.222ff), noting the employment of gold (leafs?) that were attached to the roof beams by wax (*AJ* 17.262); *cf.* Midd 2.3; 3.8.

[24] The scabbard of the late Roman sword from Khispin (Chisphin) in the Golan is made entirely of bone (Gogräfe and Chehadé 1999).

Von Carnap-Bornheim wonders why the employment of ivory is confined to so few *militaria* groups (edged arms and belts), leaving the question unanswered (von Carnap-Bornheim 1994, 31). This question may be applied to the osteological material as well. Concentrating on the personal gear, as the usage of bone in the construction of archery equipment (bow and arrowheads) is functional per-se, it becomes evident that the employment of exotic material had representational and possibly also fashionable motivations. In that respect I find no difference between applying precious metals on these *militaria* fittings and the usage of ivory and even bone. Since wearing belt and sword was the visiting card of a soldier, it is not surprising to find that he invested in these categories, following the showy 'code' of Roman soldiers (Coulston 1998, 175, 183-184). A fine example of which is the celebrated find from 3rd century Khispin (Gogräfe and Chehadé 1999). It seems that using bone or ivory for the production of other categories of military equipment would have been unfeasible in light of their physical characteristics that dictated certain strength traits, breakage pattern and tendency as well as design possibilities.

The Roman sword-hilt is of multi-pieces construction, namely the pommel, handgrip and handguard.[25] The characteristic ribbed handgrip of the *gladius* was commonly produced from cattle metapodia (Greep 1983, 20). Several such handles were discovered at Masada (V.19/F.5-8, 10). This site also yielded a collection of a rare decorated *spatha*'s handguard type (pp. 116-117). Both ivory and bone was used in its making, though the latter is far more common (V.19/F.11-14). The third component of the handle – pommel – is also documented at Masada (V.19/F.15-16). The two examples found are made of bone.
In parenthesis one may notes a bone brooch from Tiberias that was crafted in the image of a gladiatorial dagger (II.1/P.1).

Roman *balteus* fittings consist of several bone elements – buckles and frogs. Whether used as sport equipment or on a regular basis, bone belt fittings appear to be less common in the lines of the Roman army than their copper alloy parallels.[26] One such buckle is part of the Wolfe Family collection (VI.9/G.1), while bone frogs were uncovered at Masada (III.19/G.14-21), Gamala (III.3/B.9) and Jerusalem (III.12/G.2) in First Revolt contexts.
Few examples of composite bow's bone ear-laths were exposed at Masada (III.19/I.1-3).[27] Additional pair was found in the Byzantine site of Nessana (Colt 1962b, 52, Pl. XXI: 27).[28] The DNA analysis of one of the ear-laths clearly indicates a local production, as this element

[25] The hand of the sword noted in the War Scroll is made of selected horn.
[26] Nevertheless, this is not to say that bone buckles are rare finds: *cf.* Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 2012-2036, with ample bibliography on p. 53) and Augst (CH) (Deschler-Erb 1998, Nos. 4038-4039, with references on p. 178).
[27] Coulston 1985, 224-234.

was manufactured from Ibex's bones, an animal that used to be endemic to Palestine, Jordan and southern Syria alone (above, Appendix 1.1). The edges of the laths were scored presumably in order to provide the sinew backing an improved gripping (Coulston 1985, 251).

Bone arrowheads have a long tradition in Palestine.[29] An arrowhead from Cypros, seemingly dating from the Time of Herod, exhibits clear oblique production marks (I.5/I.1). These marks are further discernible upon the face of a bone arrowhead from Herodium possibly from the Second Revolt (Stiebel 2003a, 226-227, No. 7). An additional head from the Hecht Museum appears to originate in a Judaean Desert refuge cave of the Second Revolt (VI.2/I.5). A bone arrowhead of an unknown provenance, seemingly of Hellenistic-Roman date, was painted green (!), a yet unattested phenomenon (VI.7/I.1). A miniature oval shield made of bone was recently uncovered at Tel Dan in North Israel. The object was published as a 'carved bone plaque' from the Alexandrian iconographic school, and was dated to the Hellenistic period (2nd-3rd centuries BC) (Hershkovitz 2002). However, the outlines of the object and the winged thunderbolt blazon which decorates its centre clearly indicates that the plaque was a shield model (Stiebel 2003b). An identical parallel is reported from Egypt seemingly indicating the origin of the group (Museum of Fine Arts, Boston 1976, 29, No. 35), which apparently dates to the Late Roman period (3rd-4th centuries AD). This date corresponds well the recent discovery of the first bone carving workshops in Palestine, which dates to the 4th-5th centuries AD in Halusa (Goldfus and Bowes 2000) and Caesarea (Ayalon 2002). The discovery of the Tel Dan's shield model in direct association with the ritual platform reflects its ceremonial function (Stiebel 2003b).

As von Carnap-Bornheim asserted, little attention was given to the differences between ivory, bone and antler. Merely one handguard from Masada is made of ivory (V.19/F.15). Its broken face exhibits the typical lozenge-shaped structure. The item was produced from the tusk of an elephant, cut out of its dentine and was later worked: engraving and polishing.

The most prominent military object made of horn was the wind instrument – שופר (*shofar*) (Veg. 3.5). The Jewish law that is dedicated to the construction of the ram's horn aerophone specifies not only the variety of raw materials used, but its decoration method as well as diverse mending techniques in case of breakage.

The content of the bone and ivory (*eborarii*) artisan's toolbox was fairly varied (Wapnish-Hesse 1999, 14-15). Part of the faces of the osteologic objects retains technical details concerning their production. The arrowhead from Herodium was initially carved in a

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[28] Eastern ear-laths: Dura-Europos (SY) and Belmesa (EG) (Coulston 1985, 233, Nos. 26-27, Figs. 15-18).
[29] Biblical period examples (Lachish): Ussishkin 1996, 20-21; *apud* 1982, 55.

rotate manner, which was followed by the grooving of perpendicular dividing lines that form minute wings (Stiebel 2003a, 226-227, No. 7). The shaping of the handguards and pommels involved drilling, seemingly with a bow drill, which was accompanied with a gentle carving of the decoration motifs. These elements were thereafter well polished, a process that made usage of minerals and leather. The employment of fish and sharkskin was common during the Roman period (Wapnish-Hesse 1999, 14).

Such an extensive processing of the bone objects made the morphological examination, to date the major identification tool, nearly impractical.[30] This situation differs from the ivory, where 'both large and small surfaces can provide the decisive information' (von Carnap-Bornheim 1994, 29). Yet, the above noted DNA analysis not only enables us to bypass this obstacle, with regard to osteologic material, but concurrently provides us with a far more accurate and independent analytical tool (above, Appendix 1.1).

(g) Wood

Ancient historian notes the employment of wooden arms, notably the club, *vitis* (*zmora*) and cane (pp. 150-159). Wood constituted the major component of varied categories of arms: notably shafted weapons, archery equipment, shield boards as well as handle fittings of edged arms. Timbers were frequently used in the construction of siege machines and installations.

Types of arms and types of wood

Although we possess no artefactual evidence for staff-like arms (but mace-heads), a wealth of historical and representational sources is documented. Made of a vine stem, the *vitis* that equipped the Roman *centurion* had both a functional and a symbolic significance. The club (*fustis*) was made of thick stave, commonly knotted with metal fittings. The famous club of all was that of Hercules – frequently described as a knotted object.[31] This motif of bulges was so indicative in the Roman eyes that a 'timber after being floated in a river...', its, 'upper part which is knotted and harder is called club-wood (*fusterna*)' (Pliny 16.196).

Remains of wooden shafts were observed in the sockets of a lance head from Wadi Murabba'ât (V.14/H.2). But above all it is the unique complete surviving wooden shaft of a javelin was found at Nahal Qedem (V.19/H.1). The shaft is circular in section and nearly straight. Its head was carefully shaped in the form of a cone to fit the socket, while the opposite end was roundly smoothed. No additional work was needed to shape the shaft. In all likelihood the pole was cut as such from a tree. The managing of the raw wood was an important process in order to gain straight and strong poles of the right diameter (Bishop and Coulston 1993, 192). The lack of working tool marks on the shaft of the javelin indicates that

[30] For guiding lines: von Carnap-Bornheim 1994.

it was cut at the right age, thus enjoying the natural strength and flexibility of the tree. The shafts of spears in Egypt were made of palm-tree (Speidel 1981).

Indicating the 'wood of the javelin' (Sot 42_b), the *Babylonian Talmud* further notes the wooden shaft of the *verutum* (קתא דבורטיא) (Sanh 27_b). The *Mishnah* mentions the haft of the *contus* (Erub 3.3), the two-handed shafted arm (*BJ* 3.254). Additional term – מורניתא (*moranita*) – indicates the type of wood it was produced from – *murran* (Cornel).

Ample use of wood was made in the construction of archery equipment.[32] The core of the composite bow is made of wood (Coulston 1985, 250). Levantine arrowshafts of the Roman period were constructed from a short wooden fore-shaft that crowned a long reed stele. This tradition of craftsmanship was apparently the routine practice throughout the early Roman period, as attested from the finds of both the Jewish revolts and lasted, at least, up to the mid-3rd century AD at Dura-Europos (SY).[33] According to the *Midrash* 'even canes for arrows the Land of Israel does not lack' (*Ecc R* 2.8; *cf.* Thuc. 4.9.1).

The wooden fore-shaft of an arrow from the Cave of Letters (V.20/I.1) was made of the *Tamarix* species, possibly *Tamarix deserti Boises* (Yadin 1963, 91, note 110). This wood is common in wadis in close proximity to Masada. A stele from Masada was identified as *Typha latifolia* (Liphschitz 1994, Table 14, 342). As the *Typha* needs constant flowing water it can be found in the nearby oasis of 'Ein Aneva (1.5 km north to Masada), 'Ein Gedi (18 km to the north) and 'Ein Boqeq (13 km to the south).[34] The general identification of 'reed' was attributed to the arrow steles from the Cave of Letters (Yadin 1963, 91 (No. 40)), the Cave of arrows (Aharoni 1961, 20), Cave FQ37 (III.17), and recently in Har Yishai Cave (Stiebel 2004b). According to the sampled results, it is evident that all arrowshafts from Israel could have been locally produced, as the plants are native to Palestine and the neighbouring countries. In many cases the raw materials were available in the close vicinity of the site of discovery. Wickerwork shields were also produced from cane-like species and appear to have been rather popular in the East. Shields made of wickerwork are noted in the Jewish rabbinical sources and in an Egyptian papyrus of a legionary *fabrica*. Vegetius mentions the employment of wickerwork practice shields (pp. 77-79). For the types of wood use in the construction of shields, see p. 81.

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[31] On a greave from Straubing (DE) (Garbsch 1978, B 9, Taf. 3: 2).

[32] For the wood used in the early Levant: Olive bow and Olive for-shafts (Werker 1998) and reed stele (Shimony 1998, 77).

[33] Remarkably enough, this construction was practice as early as the Late Chalcolithic period in Palestine (Schick 1998b).

[34] Liphschitz's suggestion that the plant could grow on the water of the bathhouse at Masada must be rejected as it was seemingly not operated on a regular basis and surely no one would have cultivate *Typha* within the storerooms complex, where the bathhouse is located!

Wood was employed for the construction of sword handles a notable group of which was unearthed at Vindonissa (SZ) (Unz and Deschler-Erb 1997, Nos. 7-12, 17-21, 44). A single example of a wooden ribbed handle of an edged arm was unearthed at Masada (V.19/F.9). The body (belly) of sword's scabbard was constructed from a metal frame that enveloped layers of wood and leather. This method is discernible in the case of the sheathed *gladius Hispaniensis* (I.7/F.1) that was found at the upper city of Jerusalem ('House of Caiphus'). Mineralised organic remain, presumably of wood and leather were traced upon the blade of a *gladius* from the Jewish quarter excavations (Upper City) (III.12/F.1).

Wood was a prominent ingredient in the construction of the siege machinery.[35] The *heleopolis* and battering rams built under Vespesian and Titus command had massive wooden cores (*BJ* 3.213ff). They were design and constructed after the plans of Titus, an ascription that seems somewhat constrained on Josephus's behalf. Be that as it may, these huge machines had a dreading impact on the besieged population, who designated the name *Νίκων* (Victor) to the Roman battering ram (*ibid.*, 5.299). The intimidating impression lasted in the national Jewish memory for generations. According to the 'Legends of Destruction' beams were employed in the construction of the artillery and battering machinery in the siege of Jerusalem. After the conclusion of the siege these constructions were dismantled and presumably carried along with the Legion train (*BJ* 3.121).[36] John used the 'sacred timber for the construction of engines of war', i.e. towers (*ibid.*, 5.36-38). The wood beams of cedar from Lebanon were used for their quality and length, as their 'straightness and size were sight to see' (*ibid.*, 37). Wooden anti-ram devices were used by the rebels in the Jerusalem, as noted by Cassius Dio. The Romans employed wooden storming ladders (*BJ* 3.254, 6.222), the nails of which Gutman has claimed to find at the foot of Gamala's wall. Drawbridges made of beams, wooden planks and ropes were dropped into place from siege-towers (*BJ* 3.268, 274).

Tremendous amounts of wood were needed in the construction of siege mounds. Most of the wood was obtained from deforestation and the cutting down of plantations, which had a significant psychological effect as well (*BJ* 3.163; *AJ* 14.62). The Roman stripped every tree within the circuit of 90 *stadia* of the Jerusalem (*BG* 5.39; Luc. *BC* 3.426; Dio 65.4.2). Although the common notion described the Roman assault ramps as dominantly constructed from wooden beams (reconstruction: Connolly 1983, 93), the recent probes at the siege ramp of Masada proved that merely branches and thin trunks were used, rather than massive timbers (Benny Arubas, *pers. comm.*). Local trees, such as *acacia*, were cut in the nearby

[35] For example: Veg. 4.14-18; Amm. 23.4.4.
[36] Analysing the historical sources, Roth suggests that the Romans differentiate the siege train from the baggage train (Roth 1999, 80).

riverbeds. Constructing assault mounds, the Romans found shelter behind wooden and wickerwork sheds (*BJ* 3.164, 169-170). Such framed sheds protected the siege machinery.[37]

In comparison with the West, the Roman made a much-reduced employment of wood in the construction of camps. Although this was also true for the temporary camps as well (for example the camps at Masada or Bethther), historical references suggest the construction of wooden obstacles.

Different techniques were used to shape the wooden components of arms in the Roman period. The arrows fore-shafts were carved by a sharp knife (2mm wide production signs – Stiebel 2004b, No. 24, 121, PL. 1: A).[38] In stressed periods, like the Second Revolt, no much attention was given to the neat finish of the stele. As for the reed stele, the craftsman was careful to cut it at the natural joints and worked, taking advantage of the durability of these parts and hence lessening the possibility of splitting at impact. The distal end was bored and into which the sharpen end of the wooden fore-shaft was driven. The nock was cut at the proximal end to accommodate the bow-string.

Consistent working marks of an iron plan are visible on the poplar wooden boards of the *scuta* from Masada (**Fig. 16: 3**).[39] Similar shallow facets are noticeable on oval plank shield boards from Dura (James 1991, Pl. 2.4.AE, bottom). For cutting timbers and rough shaping, the Roman soldiers could have use the saw (*serra* = πρίονα) that according to Josephus was part of their *sarcina* (*BJ* 3.95; Fuentes 1991, 74 and table 1). The *dolabra* was equally useful as attested on Trajan's Column.

(h) Leather

Leather was used in the production of a wide range of military equipment (see Gansser–Burckhardt 1942; Groenman-van Waateringe 1967 and the works of van Driel-Murray). The arid climate in Palestine, mainly in the Judaean desert, preserved rare leather components. Unlike the anaerobic wet environment in which most of the western finds were found, the artefact under discussion have been discovered in dry conditions, which at times resulted in a somewhat stiff structure of the objects. Only two leather items were found out side the boundaries of the desert, at Gamala – scant remain of a leather suspension strap of a scabbard and possibly a small fragment the scabbard itself (III.3/F.23).

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[37] Discussing the construction of the burning pile of wood on the altar, the sages have wondered whether 'all trees fit for the pile? Yes! All trees are fit the pile, except the olive and the grapevine...' (Tam 2.3). It has been suggested that the vine contains water. Interestingly, during the crusades the xylem of the vine was used as a coating agent of siege towers in addition to the fresh bulls' hides against the 'Greek fire' (Amar 2000, 116-117).

[38] Clasp knife: pp. 114-115.

[39] An example of carpenter's plan: Ward-Perkins and Calridge 1976, No. 276.

DNA samples were taken from two *militaria* objects made of leather from Masada: a painted scabbard chape (*vagina*) (III.19/F.18) and the shield facing (III.19/E.7) (Kahila Bar-Gal 2000, 63-64; Appendix 1.1). The DNA sequences of the first object showed high similarity to that of the domestic goat, presumably the *Capra hircus* (99.9%)[40], while the sequences from the shield facing showed high similarity to *Capra hircus* (98%) cladding also with the sequence of the Baladi – the present local species. Goatskin was used for the production of two leather covers (facings?) from Roomburgh (NL) (van Driel-Murray 1999, 47). The supposed saddle cover from the Cave of the Letters (V.24/Q.1) was produced from a sheepskin that under gone a vegetable (pomegranate) tanning.

As technology concerns, base upon the finds from Palestine, the perimeter of the shields' leather facings from Masada exhibit stitching holes of the binding and appliqué stitching of a *tabula ansata* design (III.19/E.7). Delicate open work adorns the leather scabbard from Masada (III.19/F.18), which was also painted. Painting was used for the decoration of a *scutum* facing. A knife scabbard from the Sandal Cave is decorated by geometric incisions designs (V.14/F.1). Leather working tools[41] were found in the Cave of Horror (IL) (Aharoni 1962, 193, Pl. 27 B), including a semi-lunar knife, awls (*ibid.*, Pl. 27 B (middle) and D) and needles (*ibid.*, Pl. 27 C). Long needles alike are a rather common find in Second Revolt refuge caves (Avigad 1961, 10, Pl. 3.9; Yadin 1963, 90, No. 31, Fig. 32, Pl. 25; Eshel, Zissu and Frumkin 1998, 98, Pl. 2).

The availability and suppleness of the leather and to some degree its resistance to water made it ideal component in the production of weapons and mainly significantly accessories, which may be divided into three categories: facings, containers and suspending or fastening elements.

Leather facings of *scuta* were found at Masada, including one red crimson painted fragment (III.19/E.10). This colour adorns a scabbard from Masada (below – 1.2.10). The board had both front and rear leather facings. One example was found at the Sandal Cave (V.14/E.1). The leather covers seemingly under went a vegetate tanning, but a more detailed analysis is required to establish the exact process.

The 'containers' class range from tents to edged arms' scabbards. In the latter we count swords scabbards, leather examples of which are documented from Masada (III.19/F.18) and Jerusalem (I.7/F.1), and clasp-knives sheaths (pp. 120-121). The horse saddle was coated by a leather cover. A pommel facing was found in the Cave of Horror, Nahal Hever (V.26/Q.1)

[40] Although paint on leather can interfere with the amplification of DNA, the DNA was successfully extracted from the painted red scabbard.

[41] The excavator erroneously identified the awl as a 'larger arrow - or spear head' and the semi-lunar knife as a small axe.

and a possible front part of a saddle cover in the Cave of Letters (V.24/Q.1). We may further assign to this group leather headgear (pp. 26-27) the military footwear.

The last category consists of leather bands that were amply used by Roman soldiers, not surprisingly forming part of the soldier kit (*BJ* 3.95). The salary document of a Roman legionary from Masada mentions the purchase of '*lorum fasciari(um)*' (*Masada* II, No. 722). They attached the helmets' cheekpiece and fastened the '*lorica segmentata*' girth hoop. Internal leathers formed the skeleton (or tendons) of the '*lorica segmentata*' (Bishop 2002, 111 (index, with references)). One may note the *pteruges* attached to the bottom of the *lorica* (pp. 51-52). Used for suspending arms, the military belt was of leather (p. 125) as were the suspension straps of the scabbards and sheathes. The thickness of the belt can be deduced from the length of the pins on belt mount back – 4mm (Herodium – Stiebel 2003a, No. 4, Figs. 9-11). The equine harness was constructed of leather straps, a unique example of which was uncovered at Masada.

(i) Sinew and feathers

The elasticity, strength and availability of the sinew made it ideal as springs of torsion artillery machinery (James 1990, 92), and as a binding agent in the manufacture of archery tackle. Extracted from animals' bodies, in the Near East we posses direct testimony for the employment of sinew from the hocks of bulls in the manufacture of bows and arrows (Yadin 1947). Indeed, it was sinew from cattle or deer leg tendons that was proven in practical experiments to be most apt (Coulston 1985, 253 and note 159). In Palestine, archaeological evidences were found to the sinew whipping of arrowshafts in the Cave of Arrows (V.28), Cave of Letters (V.24), Har-Yishai Cave (V.21) and the Hecht Museum (VI.2). This whipping prevented the shaft's splitting during production, shooting and upon impact. Applied wet, the 2mm wide sinew band shrunk when dried, hence tightening around the body it bound. Soaked with glue, a sinew whipping was lashed around the distal end of the wooden fore-shaft, into which the head's tang was introduced (**PL. VI.2A: 1**). Such a band was applied upon the joint between the wooden fore-shaft and the reed stele. One example alike from Har-Yishai Cave (33mm) was composed from two bands (16-17mm), the knot of which (4mm long) is still visible (Stiebel 2004b, Fig. 4b, Pl. 2a). A third sinew band was bound near the notch (**PL. III.18: 4**). Following the crest painting, it was applied in order to provide extra strengthening for the curving of the notch. A bundle of sinew, bound by a leather band was uncovered in Cave 5, Nahal Mishmar (V.27; **PL. V.27: 4**). Traces of fletching are observable on the rear part of arrow steles from Nahal Se'elim and Hever (V.28 and Stiebel 2004b). Only scant remains of the actual feathers (**PL. V.28B: 5**) were observed and at the current stage no morphological identification is available. An example with intact fletching was found in

Dura-Europos (SY) (Rostovtzeff *et al.* 1936, 453, No. 1; James 1987, 78, Figs. 3-4; James 1990, 86-87, 261-262, Pl. 2.6.I-J). The species of the white feathers was not identified.

(j) Stone and geological substances

Stone was used for the production of varied missiles, whether simply thrown by hand, hurled by a sling, shot by a torsion artillery machine, or used as massive rolling stones that were pushed down walls. Stone slingshots are probably one of the most ancient forms of ammunition. In the Roman period the shots originate in two sources: worked stone shots and unworked stones, which were gathered with a varied degree of selection. In the latter class we may point out the pebbles that were recognized for their aerodynamic outlines and high specific gravity (Veg. 4.8) and not less important were much available in the field. Few worked slingstones are reported from Palestine, all made of limestone. For the production of ballista balls see: Stiebel 2003a, 220.

The use of local stone applies also to the category of rolling stones. All the stones that I have examined (Qeren Naftali, Masada, Herodium) were produced from the local limestone with variations in size and finish. Most of the stones were rough flaked possibly by an adze-like utensil, the scars of which (*c.* 30-50mm) are clearly evident (**PL. III.19W: 1-3**). The only instance, in which one may refers to *ballista* balls of high calibre at Herodium, is documented in Corbo's final report (Corbo 1989, DF 119), where four circular stones exhibit very smooth surfaces and fine spherical shape (also Qeren-Naftali: **PL. I.1A: 2, 4**). This type of craftsmanship resembles shots from Dor (Shatzman 1995, 60-61). Nevertheless, their dimensions may suggest they should be rather categorized as rolling stones. In this case the surface of the stones was finely chiselled providing a smooth outcome.

The Roman craftsmen seemingly used a hammer and a chisel to shape the balls. On the surfaces of many *ballista* balls from Herodium, clear working signs of a chisel (five teeth) are visible (Stiebel 2003a, 220, Fig. 4). Arab stoneworkers use to date the *tumba* – a chisel with a toothed working edge for the shaping of corners (Kroyanker 1985, 386, illustration on p. 390). Theoretically, the stone-cutters could have employed a toothed hammer – *matabe* (*ibid.*, illustration on p. 389), a tool confined to hard stone; but this was seemingly not applicable at Herodium, as the balls from Herodian that exhibit tool marks are hewn from softer stone. If such a tool was indeed in use the cavities between the teeth of the hammer would have been soon filled with the stone dust, making its employment unpractical. It therefore seems apparent that at least these shots were shaped by a chisel.

It seems that for the rough shaping of the rolling stones, merely a hammer would do. The smooth surface would have possibly achieved by the *šachuta* (شاحوطا = שחוטה) – like hammer (Kroyanker 1985, 386). The smooth surface of the small worked slingshots may be the result

of a filing. Jerusalemite stone-cutters (*λιθοτόμους*) and their iron tools (*σίδηρον*) are noted in Josephus's account concerning the capture of Simon ben Giora (*BJ* 7.26).

Clay

Slingshots were commonly made of clay. Clay was favoured due its high specific gravity (the same argument is true for pebbles). One biconical example of unbaked clay is reported from Herodium (V.7/K.2). Unlike the east, where the shots were seemingly dried in the sun, the examples from the Roman west are baked, presumably in a hearth (Griffiths 1989, 258, note 166). Red-hot clay shots were cast by the slingers of the Nervii into a Roman camp of Caesar's force in 54 BC, causing fire to the thatched roofs (*BG* 5.43).

Bitumen

A local substance that was in military use is the bitumen – asphalt (Stiebel 2000).[42] In addition to medical and cosmetic applications, the asphalt that was extracted from the Dead Sea[43] by the local population had varied militaristic functions like an ignition material, smearing material on the rear parts of the arrows' mainshafts and possibly as a bonding agent on shields (p. 91).

(k) Paint

> 'For woven stuff and other materials, white will be a color befitting the gods; but dyes they must not employ, save only for military decorations' (Pl. *Laws* 956a).

Although little preserved in the archaeological record due to its perishable nature, paint was commonly used for the decoration of *militaria*. It was mainly applicable to the material of organic nature (leather, wood and bone), nonetheless at least one example seemingly indicates the applying a sort of paint (camouflage) over a limestone *ballista* ball. As demonstrated above the Roman soldier boasts his shiny equipment, and strong dyes had evidently the same effect, as did the metal. Indeed, paints like vermilion red were applied upon the shields and scabbards, while the military tunic is commonly regarded as red. The colour palette on the *militaria* from Palestine included also the green (see below). Azure dyed fragmented hides were found at Masada in L1039, which yielded shield fragments, yet in this stage one can not associate them with shield facing.[44] In Dura-Europos scientific analysis identified the usage of vermilion, carbon black, reddish yellow earth and indigo (James 1990,

[42] 'The best asphalt... is the Judaean' (Galen, *De antidotis* I, 12 (Stern 1980, Nos. 392, 327)).
[43] *Asphaltites lacus*, *Ἀσφαλίτης λίμνη*.
[44] During our recent excavations at Masada, a small plate containing blue pigment was uncovered in Area N2. It was in all likelihood used for the wall painting during Herod reign. Similar finds are documented in Jericho.

68; Rostovtzeff, Brown and Welles 1936, 368-369). The paints were based on water, tempera (Egg-white) and possibly casein solutions.[45]

The initial function of colour applying was evidently ornamental. Decorating one's equipment allowed the soldier to express his taste, to follow fashion trends and above all to achieve personal distinctiveness in a group of people whose equipment were, generally speaking, rather standardized. Such an individual expression had also practical reasoning, as for example the varied painted designs of the shields, mentioned above, enabled the commanders to identify the best performing soldiers during the battle (p. 93ff).

On the unit level, it seems that sharing distinct symbols, some of which were presumably painted, like the blazon emblems, has fortified their sense of solidarity, a much desire feature in the lines of the army (Goldsworthy 1996, 252-257). The adaptation of visual symbolism of distinct identities seems to have further developed in the late Roman period the celebrated example is the shield emblem per unit that is presented in the *Notitia Dignitatum*. Vegetius claims that each ancient legion had distinctive design upon its shields (Veg. 2.18), while Ammianus Marcellinus notes that the Roman units were indeed using distinctive shield blazons (Amm. 16.12.6).[46]

Additional symbolic implication of the use of colour was the identification of the Romans with the red. The local population of Judaea named the Romans: Edom (אדום), after their red uniforms. As detailed below the red was indeed popular, decorating, for example, *scuta* facings or leather *vaginae*. Like their symbolic importance in the ancient outfit, specific colours may have magical protective qualities.

In addition to the varied symbolic implications, painting had also functional importance. Thus, the arrow cresting could have made the arrow more visible in flight and seemingly assisted in its gathering (pp. 251-252). Cresting could have assisted the archer to distinguish certain arrows, should he have carried different arrowheads in his quiver. We will now briefly detail the diverse examples of paint employment with *militaria*.

Arrows were subjected for extensive painting treatment. Although the stele was the dominant part which was decorated (Stiebel 2004b, 123-124), a very rare bone arrowshaft of the Deutsch Collection was painted green (VI.7/I.1). The reason for painting the head, other than decorative objective, will remains at this state of knowledge unknown.[47]

The leather facing of a shield from Masada (III.19/E.10) was painted vermilion red. The colour was applied directly onto the hide. This media was used at Dura-Europos (SY) (James 1990, 68). It is very possible that additional leather coverings were decorated by paint, which

[45] A protein that was extracted from curdled milk.
[46] Claud. *Bel. Gild.*, 423.

did not survive. This may have been very well the case with the European examples, like in Vindonissa (CH). A different painting method is observable on the fragmented shield board from the Sandal Cave (V.14/E.1) that was decorated with red and black paints. The paint had been applied upon gesso layer. This technique is oriental in origin, the earliest example derive from the 2nd century BC at 'Ai Khanoum (AF) (Bernard 1973). Yet, the finest examples originated in Dura-Europos and are thoroughly discussed by James (James 1990, 68-71). The gesso layer that form the foundation for the paint is reported to 'derived from a rather impure gypsum and probably some lime' (Rostovtzeff, Brown and Welles 1936, 368). The find from the Judaean Desert seems to form a 'missing link', bridging between the Hellenistic finds and the Late Roman Duranic examples.

Additional painted leather category was the edged arms' scabbards. An exquisitely well-preserved example of a coloured *vagina* was uncovered at Masada (III.19/F.18). The tooled leather scabbard was painted vermilion red. Faint remains of red colour are discernible on a knife scabbard from the Sandal Cave (V.14/F.1).

The pictorial sources suggest that leather harness elements as well the saddle cover were dyed as well in red while the latter is also reported to dress in purple.

During the siege of Jerusalem (AD70) the Romans have camouflaged the limestone *ballista* balls in order to make them less discernible to the foe's watchmen (*BJ* 5.273). According to Josephus they blackened (*μελαίνειν*) the shots. The stone shot from Herodium that was intentionally coated in ash pre-shooting, seemingly illustrates Josephus's narration (Stiebel 2003a, 221-222, Fig. 5).

(l) Textile

Outside military clothing, textile and weaving techniques were used in the production of the sling. The *Mishnah* refers to a 'sling that its pouch is woven (ארוג)' (Eduy 3.5). An 8th century BC woven sling was found in Egypt (Petrie 1917, 36, Pl. 15: 14v). Textile was employed for lining the inner face of the helmets' bowls and cheekpieces (pp. 26, 28). In addition, it served as a binding agent in the production of shield boards. According to Polybius the Roman republican *scutum* was constructed of two plywood layers which were coated by a layer of textile and hide facing respectively (Polyb. 6.23.3). A well-preserved fragment of a *scutum* from Masada exhibits such a construction, the crimson leather facing

[47] In addition, a site cart from Dura-Europos, in the Yale archives, possibly notes the discovery of a painted spear shaft, the whereabouts of which is unknown (James 1990, 240-241).

was attached to a soaked glue textile layer (**PL. III.19K: 3**; III.19/E.10). It is pale linen of S/S weave, a weaving technique more indicative of the local production.[48]

[48] I thank Hero Granger-Taylor for answering my inquiry concerning the nature of the textile.

Appendix 2

Terminology of *militaria* in Flavius Josephus's writings

The following index lists the Greek terms used by Josephus in his accounts to designate military equipment, along with their translations into English and Latin (when relevant) and references respectively. The list was arranged according to subjects, following the general scheme of the thesis. I am deeply grateful to Ms. Lisa Ullmann for her invaluable assistance regarding this index. I made ample use of Rengstorf *et al.*, *A complete concordance to Flavius Josephus*, Vol. I-IV, Leiden, 1973-1983.

General

πανοπλία = Panoply, equipment of heavily-armed soldier, armour, armour and weapons, weapons	*AJ* 4.88; 6.113, 363, 374; 7.15, 104; 8.377; 12.410; 13.141, 309; 20.110
σίδηρος = sword, blade, dagger, weapons, iron arrowheads, spearheads	*AJ* 20.165; *BJ* 3.240, 6.23; 6.87
ὅπλον = weapon, arms, armour, armament, heavy arms	*AJ* 6.244; 9.148, 179; *BJ* 1.75, 224; 2.452, 576; 3.252, 314; 5.7; 6.240; 7.370, *Vita* 290

Helmets

κρανος = helmet; *cassida* (*galea*)	*BJ* 3.93, 96, 275; 4.593; 5.61; 6.88

Armour (see also above: *πανοπλία* and *ὅπλον*)

θώραξ = cuirass	*AJ* 6.171, 184, 187; 7.283, 299; 8.414; 9.221; 12.354; 13.373; *BJ* 3.93, 96, 275; 5.61, 233, 323; 6.88, *Vita* 293
κατάφρακτος = mailed, in full armour; *cataphracti*	*BJ* 5.350

Military dress

ὑποδήματα πεπαρμένα πυκνοις καὶ ὀξέσιν ἥλοις ἔχων = nailed sandal; *caliga*	*BJ* 6.85

Shields

ἀσπίδιον = *small shield*	*AJ* 12.80
ἀσπίδα = round small shield; *parma*	*AJ* 8.180; 8.259, 263, 291; 12.372; 13.96, 339; 14.147, 148; *BJ* 1.601; 3.95
θυρεον ἐπιμήκη = oblong buckler; *scutum*	*BJ* 3.95
θυρεός = [oval] shield of the cavalrymen	*BJ* 3.96
θυρεός = shield	*BJ* 2.452; 2.537; 3.95, 96, 270; 4.290; 5.120; 6.27, 58, 65, 87, 174, 224, 245; *AJ* 6.70; 7.55, 8, 59; 8.179, 247, 259, 263, 291; 9.221; 11.177; 13.339
θυρεός = local shields	*BJ* 3.259; 6.197

Edged arms

ἀκινάκης = short Persian sword	*AJ* 20.186
μάχαιρα = sword	*AJ* 6.190; 7.12, 35, 283, 284, 327; 8.31, 340; 9.147; 11.177; 12.287; 14.425; 19.259; *BJ* 3.96; *Vita* 173, 293, 303
ξίφος = sword	*AJ* 5.205; 6.184; 14.357, 463; 15.288; 16.211; 17.263; 19.55, 85, 105, 109, 110, 122, 124, 138, 243, 263, 270, 273; *BJ* 1.519, 520, 2.49, 173, 176, 211, 213, 425, 452, 471, 475, 476, 601, 619, 644; 3.94, 296, 359, 360, 364, 386; 4.27, 200, 258, 301, 311, 329, 340, 344, 425, 519, 563, 640; 5.62, 323, 477, 516, 517; 6.58, 75, 87, 174, 187, 361; 7.250, 386, 397; *Vita* 138; *Against Apion* 2.235
ξιφίδιον = dagger; *pugio*	*AJ* 5.190, 193; 14.291; 15.282; 20.164, 186; *BJ* 2.255; *Vita* 293
σίδηρος = sword	*BJ* 4.27; 6.87
σίκη = curved dagger; *sica*	*AJ* 20.186
ρομφαία = broad sword	*AJ* 4.153; 6.187, 190, 192, 244, 254, 370, 371; 7.3, 12, 59, 299, 309; 9.221; *BJ* 3.386; 6.86, 224, 289

Shafted weapons

ἄκων = light javelin	*BJ* 3.96; *AJ* 7.135

ἀκόντιον = light javelin	*AJ* 6.233
δόράτιον = small spear	*AJ* 6.244
δόρυ = spear; *hasta*	*AJ* 6.171, 187, 214, 220, 238, 312, 313, 315, 318; 7.15, 58, 59, 315; 9.148; 14.313; *BJ* 3.96, 335; 5.313; 6.75; 7.14; *Against Apion* 1.99
διαδορατιξόμενοι = missiles (spears?)	*BJ* 5.119
κοντός = heavy spear; *contos*	*BJ* 3.96, 225, 254, 488, 526
λόγχη = lance; *hasta*?	*AJ* 6.171; 16.315, 316; *BJ* 3.95, 167
ξυστόν = *pilum* (?)	*AJ* 7.299; *BJ* 3.95; 6.22, 86
ρομφαία = spear ? (Thracian in origin)	*BJ* 6.86
σιρομάστης, σειρομάστης = barbed lance	*AJ* 7.55; 8.247, 291, 340

Archery

τοξεία = archery: plural bows	*AJ* 1.103; 5.205
τοξευμα = arrow	*AJ* 4.91; 13.385
τοξον = bow; arrow	*AJ* 1.103; 8.186; 9.180, 221; 10.19; *BJ* 5.268 *Against Apion* 1.203
ὀιστός, οἰστός = arrow; *stele*	*BJ* 3.167

Clubs, sticks, staves and maces

ξύλον = clubs	*BJ* 2.326, 526

Sling and stones

σφενδόνη = sling; *funda*	*AJ* 4.91; 6.185, 189; 9.221; 17.259
σφενδόνη = slingshot; glans	*AJ* 14.435
χερμάς = slingshot; *glans* (stone)	*BJ* 1.332; 2.423; 3.162, 525; 4.27; 5.117, 174, 268, 548
λίθος = stones	*BJ* 2.445, 526 (s.v., Rengstorf *et al.*)

Accessories

πρίονα = saw; *sera*	*BJ* 3.95
κόφινον = basket; *kophinos*	*BJ* 3.95
ἄμην = pick	*BJ* 3.95
πέλεκυν = axe	*BJ* 3.95
ἄμην τε καί πέλεκυν = pick and axe (pickaxe); *dolabra*?	*BJ* 3.95
ἱμάντα = leather strap; *lorum fasciarium*	*BJ* 3.95

δρέπανον = sickle; *falx*	*BJ* 3.95
άλυσιν = chain	*BJ* 3.95

Torsion artillery

άρπαγας = engine for throwing grappling-iron	*AJ* 9.221
άφετήριος μηχανή = engine for hurling missiles	(s.v., Rengstorf *et al.*)
δορυβόλος = engine for throwing spears; catapult	*AJ* 9.221
έκήβολος = engine for hurling missiles	*BJ* 2.423; 3.151
λιθόβολος = engine for hurling missiles; *ballista*	*BJ* 3.80, 246; 4.583; 5.14, 263, 269, 359; 6.121
λιθόβολος μηχανή = engine for hurling stones; *ballista*	(s.v., Rengstorf *et al.*)
ὀξυβελής = engine for hurling arrows; catapult	*BJ* 2.553; 3.80, 185, 243; 4.583; 5.14, 263, 269, 359, 484; 6.121; 7.308
όργανα άφετήριον = engine for hurling missiles	(s.v., Rengstorf *et al.*)
πετροβόλος = large calibre *ballista*	*AJ* 9.221, 14.62; *BJ* 1.147; 3.167, 173, 240; 4.19; 6.309; 7.309

Rolling stones and heavy projectiles

βελος = missile	(s.v., Rengstorf *et al.*)

Siege equipment

γέρρον = wickerwork sheds; *vineae*, *musculi*	*BJ* 3.163, 169, 220, 227, 240; 5.269, 280, 479
γεφύρωμα = *scaling-bridge*	*BJ* 3.275
ἑλέπολις = siege-tower/engine; battering ram	*BJ* 2.553; 3.121, 226, 230; 5.275, 279, 281, 299, 317, 329, 473, 479; 6.23, 26, 221, 393
κλίμακας = storming-ladder	*AJ* 12.338; *BJ* 3.257, 264, 301; 6.179, 222, 224; *Vita* 395
κρίος = battering ram; *arias*	*BJ* 3.223 (s.v., Rengstorf *et al.*)
μηχανή = siege engine	*BJ* 1.147, 578; 2.546, 554; 3.166, 224, 243, 252, 254, 260, 267, 278; 4.17, 19, 127, 291, 583;

	5.263, 286, 474, 476, 490; 6.121, 345, 392, 411; 7.143 (s.v., Rengstorf *et al.*)
Νικον = 'Victor' (battering ram)	*BJ* 5.299
ὄργανον = war machines	(s.v., Rengstorf *et al.*)

Riding equipment

χαλινοῦνος = bridle[49]	*BJ* 6.153
χαλινός = bridle	*BJ* 2.387

Military wind instruments

σάλπιγξ = war-trumpet (trumpet)	*AJ* 3.291; 5.223, 225; 7.17, 80, 359; 8.94, 283; 9.12; 10.213, 214; 11.80, 83, 84; 12.410; 20.178; *BJ* 2.579; 3.86, 89, 90, 91; 4.20, 582; 6.69

Military decorations

στεφανους ἐπετίθει χρυσους = golden crowns; *corona aurea*	*BJ* 7.14
δόρατα μακρά (μικρὰ) χρυσα = golden (little) spears; *hasta pura*(?)	*BJ* 7.14
περιαυχενια τε χρυσα = golden neck-chains; *torques*	*BJ* 7.14

Tents

σκηνή = tent; *papilio*	*BJ* 3.79, 82, 89, 6.254

Military chariots and cart fittings

ἅρματα = war-chariot	*BJ* 6.298 (s.v., Rengstorf *et al.*)

[49] *ἀποχαλινοῦντες* = unbridle. This rare word appears in Xen. *Eq.* 11.7.

Appendix 3

List of innovations in rabbinical Hebrew and *halachah*

'Anyone who dips into the Talmudic lexical will at times be perplexed by the diversity of etymological explanations offered for a given word. Indeed, at times he finds himself at a loss even as to the correct reading' (Sperber 1975, 163).

Detailed below are two lists of Talmudic terms for which I offer new reading, interpretation, or the combination of both. The initial list notes etymological innovations and clarifications as to what the terms designate accompanied by references to the dissertation. In the subsequent index I have gathered the innovations in rabbinical laws and the references to the relevant part of the dissertation. The exclusion of large number of sections and subjects from the final draft resulted in the omission of multiple references, hereby noted as 'not included'.

Hebrew	Meaning	Origin or relation	Reference to the dissertation
גירא	arrow (cane)	*γέρρα* (Greek)	p. 78
מנפש	stick	–	p. 152
ניקון	basket	*κάνεον* (Greek)	not included
פגוש	stone	*παγος* (Greek)	not included
צפירא, ספירא	plant	*Ṣapru* (Assyrian)	Not included
קולב	hanger	*clavus* (Latin)	Not included
קינוקנות	basket	*κάνεον* (Greek)	Not included
	stick ?	*ciconia* (Latin) ?	
קליפה	scale	*clipeus* (Latin)	Not included
קרן	trumpet	*cornu* (Latin)	Not included
רידים	spikes ?	*radius* (Latin)	Not included
שעם	plant	*šammu* (Assyrian)	Not included

List of innovations in the interpretation of *halachot*

Reference to the halachah	Reference in the study
Eduy 3.5	p. 183ff
Kel 11.7	not included
Kel 11.8	pp. 24, 28
Kel 14.2	pp. 154-155
Kel 14.5	not included

Reference to the halachah	Reference in the study
Kel 15.4	pp. 153, 136
Kel 16.8	pp. 150-152
Kel 21.3	not included
Kel 24.1	p. 75ff
Kel 29.6	not included
Miqw 10.8	not included
RH 3.2-4	not included
Sut 8.1	p. 97
T Kel BB 4.14	not included
T Kel BM 1.8	not included
T Kel BM 3.1	pp. 51, 152
T BM 3.24	p. 27
T Shab 12.14	not included
AZ 15_b-16_a	pp. 97-98
BB 9_b	p. 41
Nid 13_b	not included
Sanh 75_b	p. 41
Shab 62_a	p. 27
Zeb 88_b	p. 23
BM58_b	p. 27
BM 84_b	not included
Shab 60_b	not included
PT Hor 10 2.5	not included
PT RH 59_c	not included
PT Sota 8, 22_b	not included
Gen R 98	p. 152, note 10
Mid Ps 1.4	p. 82
Sifra Deut § 204	p. 141
Song R 1.9	p. 41
Jalk 478	p. 41
ADRN B, 7	not included

Appendix 4

Lexicon of rabbinic literature

(after Safrai 1994, 459-462, with some modifications by me)

The rabbinic literature of the Mishnaic and Talmudic periods is a summary of the discussions that were held in the different *batei midrash* (schools), particularly in the period between the first and the forth centuries CE. Some of the essays mentioned were written or edited later, between the fifth and the ninth centuries, but these contained only a bit of "updated" material, such as proverbs or opinions from the sixth or seventh century. The essays that include material from this period are noted below.

The languages used for teaching in the *batei midrash* (schools) were Aramaic and Hebrew. The writing and editing were done mainly in Hebrew; in some of the essays some material in Aramaic was also incorporated.

BASIC CONCEPTS

(1) **Mishna**. The root *sh.n.n.* means 'to learn', so the *mishna* means learning *halachah* (see below) – the decision or the settlement[50] of a controversy between two rabbis, without justification or explanation.

(2) **Talmud** (in Hebrew) or Gemarra (in Aramaic). The root *l.m.d.* in Hebrew means 'study'. The corresponding root in Aramaic is *g.m.r.*; hence the term 'Gemarra'. The Talmud is a study of the Mishna, an investigation of the rationale and precedents of each decision, a search for parallels and examination of its possible implications.

(3) **Midrash** is the study of the Bible, and particularly the Torah, in the light of the interpretations of the rabbis. In this context the focus is on identifying the relations between the rules that appears in the Mishna and the verses of the Torah. Some of the teachings of the rabbis are interpretations; the majority are books far from literature readings. Similar to the Greek scholastics and the fathers of the Church, the rabbis adopted "creative interpretation" and took the liberty of removing things from their straightforward context so that they would fit with the *halakha* and the accepted views of their times.

Later, these three terms also became the names of written texts according to this method of study (see below).

Numerous *batei midrash* (schools) operated in Palestine and in Babylon; we have texts from dozens of such institutions. Representing hundreds of years of learning and study, the material of course comprises many literary strata. In general, these are not personal works but

[50] Ruling.

the summary of teachings of a social and intellectual stratum that invested tremendous cultural effort in their preparation.

THE CHRONOLOGY

We do not know exactly when the literature on the Oral Law was first written. The earliest specific mention is found in the second century BCE, and the first real information dates back to the days of the Second Temple. The rabbinic literature became a reliable and significant source from approximately the late first century to the mid-fourth century.

In term of chronology and literary aspects, the known essays can be divided into two main groups: (a) *Tannaic* texts, which were written (put to writing) in the first half of the third century, and (b) *Amoraic* texts, most of which were written between the fourth and seventh centuries, the period known as the "Amoraic period" (230 – late 5th century CE). The essays combine Tannaic and Amoraic material. Sometimes they present sayings as Tannaic, but these have been somewhat edited and in some cases rewarded by the *Amoraim*. In most of the essays there is almost no reflection of life in the Amoraic period, that is, after the fourth century.

MAIN TERM

Torah or Scriptures

These are the books of the Bible, particularly the Pentateuch. Obligatory reading, they also served as a source of inspiration. The rabbis considered themselves bound to obey the Torah unquestioningly. This duty was also interpreted as the right to preach (see below) on the teaching of the Torah.

Oral Law

This term encompasses all the writings of the ages that involve interpretation and expansion of the **Scriptures**, as well as independent and new works.

Rabbi

'Rabbi' or '**sage**' is the accepted term used to refer to the authors of the different generation. The rabbis assumed the right to interpret, to convey as tradition, and to renew and create (within limits, which we will not discus here). In the Tannaic period (late 1st century BCE – 230 CE) the rabbis were known as *Tannaim*; in the Amoraic period, as *Amoraim*.

Midrash

The *midrash* was the method by which the rabbis learned and interpreted the Torah. The *midrash* sometimes ignores the simple content of the Torah and removes verses and even words from their contexts, shifting them to another subject. The *midrash* is, then, almost

unrestrained "creative" interpretation. The *midrashim* are divided into *midrashey halkha*, in which "rules" are learned from the verses, and *midrashey agada*, which deals with legends, moral teachings, stories and the like.

Halachah

Halachah is the Jewish decision or ruling as edited and developed in the discussions of the rabbis.

Mahloket (controversy)

The oral Law evolved over many generations in different *batei midrash* (schools) and under the direction of different rabbis. In the course of time, differing opinions emerged. All these were considered legitimate and many were preserved in the oral tradition and in the rabbinic literature.

Baraitha

All the Tannaic traditions that were not collected in the Mishna are known as *Baraithot*. These are found in a number of volumes, such as the "Tosefta" and the "*midrashey halakha*," and many of them are integrated into the literature of the *Amoraim*.

MAIN TYPE OF BOOKS

The *Mishna* is a collection or edited version of the rules and controversies on issues related to the *halachah*. Edited by Rabbi Yehuda Hanassi (early third century), it is written in the "*Mishna*" style. However, in some places excerpts of "*Midrash*" and "Talmud" are incorporated. The Mishna is divided into six *orders*; in each order there are several *tractates*, which are divided into chapters and subchapters. Every tractate is devoted to a specific subject.

The Mishna served as a text book in the *batei Midrash* (schools) in the Talmudic period, and it played a central role in the determination of laws that were established for the generations to come. It is unclear whether Rabbi Yehuda Hanassi saw his work as a text book alone, or also as a collection of rules (*Halachot*). It seems that the former possibility is more likely.

Tosefta

The Tosefta is a collection of *Baraithot*, organized according to the Mishna, which includes expansion on the teachings of the Mishna and various additions to the Mishna, examples of the rules in the Mishna, and the like. It is likely that there were several such collections. The extant Tosefta was first printed in the end of 1521.

The Jerusalem Talmud

This Talmud contains a collection of discussions of the Mishna in the *batei midrash* (schools) of Palestine, and was put to writing according to the Talmudic teaching method. The authors of the Jerusalem Talmud considered the Mishna a textbook as well as a book of rules. The Jerusalem Talmud was concluded in the late 4th century or early 5th century. It is not fully edited and is difficult to comprehend.

The Babylonian Talmud

The Babylonian Talmud is similar to the Jerusalem Talmud in character. It mainly consists of the discussions held in the *batei midrash* (schools) in Babylon and got its final reduction probably c. 500AD. It includes Tannaic and Amoraic traditions from Palestine and Babylon. The Babylonian Talmud is known for its thorough editing and precise literary structure, which was improved by the different groups of editors. The internal editing in this Talmud is more developed than that of the Jerusalem Talmud; this facilitates study but makes it more difficult to use the text as a historical source.

Midrashey Halachah

This is a group of Tannaic *midrashim*, which interpret and teach the five books of the Bible in which there are rules (excepting the Book of Genesis). Although most of these *midrashim* are concerned with rules (*midrashey halachah*), some also deal with legends. The teachings of rules are Mekhiltah (by Rabbi Yishmael and Rabbi Shimon Bar Yohai) on the Book of Exodus; Siphra or the Law of the Priests on Leviticus; Siphre and Siphre Zuta on Numbers, and Siphre and Midrash Tannaim for Deutoronomy.

Midrashey Agada

This is a general term for numerous books that contain *midrashim*. All *midrashim* that are not included in the list of *midrashey halachah* are *midrashey agada*. Most of these are homilies on and interpret books of the Bible, such as the *midrash* Bereishit Raba on the Book of Genesis, and *midrash* Tehilim for the Book of Psalms. This group also includes some unusual essays, which are constructed in a different literary form.

Appendix 5

The geographic setting

(after Mazar 1990, 1-9)

The evolution of human culture in Palestine was greatly affected by the country's geographic location, topography, climate, water, and other natural resources.

In spite of its small size, Palestine comprises extremes in topography, landscape, and environmental conditions. Lengthwise, the borders of the country, from Dan in the North to Elath in the South, include 410 km (256 miles), but only 220 km (140 miles) of the territory, from Dan to Beer-Sheba, are adaptable to permanent settlement. To cross from the Mediterranean Sea to the Jordan River, one travels an average of 80 km (50 miles), and the inhabited land in Transjordan is no more than 40 km (25 miles) wide. In all, the fertile land in the country, including the semiarid regions of the northern Negev and Transjordan, approximates 20,000 sq km (nearly the size of New Jersey).

The geographic location of the country determined its important role in the history of the ancient Near East. On the one hand, Palestine formed a bridge between the two ends of the Fertile Crescent-Egypt on the south and Syria and Mesopotamia in the north; on the other hand, it was compressed between the Mediterranean Sea on the west and the desert to the east. This unique situation was a basic factor in Palestine's history and cultural development. More than any other country in the ancient world, Palestine was always directly or indirectly connected with other parts of the Near East and the eastern Mediterranean. Its closest ties were naturally with Egypt and Syria, but relations with Mesopotamia, Anatolia, Cyprus, the Aegean, and Arabia also had considerable influence on its cultural history.

Palestine, in fact, should be considered part of the more extensive region generally denoted "the Levant," including Palestine, Lebanon, and the western half of Syria (the Orontes Valley and the region of Aleppo), which have various common geographic and climatic factors. The Levant's southern part, comprising Palestine, Lebanon, and southern Syria, constitutes a homogeneous unit which conforms with the biblical definition of the Land of Canaan.

Palestine's landscape today is a culmination of geological changes including sea incursions and tectonic movements, the last of which were witnessed by the earliest humans in the Jordan Valley, who lived there between one and two million years ago.

North of the Negev Desert, the country can be divided into several major longitudinal strips, the topography, breadth, and altitude of which vary: the coastal plain, the Shephelah foothills, the central mountain ridges, the Judean Desert (located east of the Judean Hills), the Rift

Valley, mountains or plateaus east of the Rift Valley, and the eastern desert. East-west valleys, the most important of which is the valley of Jezreel, transect these units and create natural communication lines between the coastal plain and the inner parts of the country.
Palestine's coastline lacks natural inlets, except for the large Bay of Haifa with the port at Acre, and the coves at Jaffa, Dor, and 'Atilt. In the south, the coastal plain is wide, and parts of it are covered by sand dunes originating from the Nile. Farther inland, in the south, the plain rises to become low hills consisting of loess soil (soft, sandy soil). North of the Yarkon River, where it is called the "Sharon Plain," the coastal plain narrows. Two north-south sandstone (*kurkar*) ridges divide the Sharon into long narrow troughs which could easily become marshes due to poor drainage. The Sharon is known to have been forested in antiquity with oaks and terebinth trees. The coastal plain narrows even more along the Carmel ridge, which descends into the sea at Haifa In the valley of Acre and north to Rosh Haniqrah, the plain again widens. Rosh Haniqrah is a mountain ridge on the sea line which creates a natural border between Israel and Lebanon

The coastal plain abounds in light, sandy soil (*hamra*) and water sources, and consequently it is one of the most fertile agricultural areas of the country. It is transected by several rivers, the most important of which (from north to south) are the Naaman, Kishon, Taninim, Alexander, and Yarkon. South of the Yarkon, most of the waterways, such as the Sorek, Lachish, Gerar, and Gaza brooks, are dry most of the year.

The foothills known by the biblical term "Shephelah" comprise a region of limestone hills which reach a height of 400 m above sea level. These hills lead to the Judean Hills, but farther north they are almost nonexistent. Inner alluvial valleys in the Shephelah, such as the Ajalon, Sorek, and Elah, provided land for agriculture and routes connecting the coastal plain and the inner mountains. The light gray *rendsina* soil of the Shephelah is conducive to pasture and to growing vines and olive trees.

The central mountainous ridge is divided into several different units. The northernmost is the Upper Galilee, where the topography is rigid and steep, and where the highest mountain in Israel (Har Meiron, 1,208 m above sea level) is located. The Lower Galilee, as its name implies, is lower, and its ridges are separated by inner east-west valleys such as the Netofa and Beth-Hakerem. In the east, plateaus such as the Issachar highland separate the mountains from the Jordan Valley.

The mountains of Samaria, bordered on the north by the Valley of Jezreel and on the south by the region of Shechem, are rather shallow; they are separated by wide inner valleys, such as those of Dothan and Sanur, that provide cultivable land and communication routes. The Shechem Brook and Wadi Far'ah cross the central mountains from west to east and serve as important links between the Jordan Valley and the coastal plain. South of Shechem, in the

lands of Ephraim and Benjamin, the mountains become steeper, and inner valleys are sparse. The main route here is along the north-south watershed, connecting Shechem, Jerusalem, and Hebron.

The saddle of Jerusalem, about 800 m above sea level, is another important west-east pass in this region; it leads from the central coastal plain toward Jericho and the Amman area in Transjordan. The Hebron Hills recall those of the land of Ephraim in their steepness and lack of inner valleys. Both these regions reach heights of almost 1,000 m above sea level. The mountains, with an average annual rainfall of 600 mm and *terra rosa* soils, were heavily forested in antiquity. Settlement was possible only after the felling of the forest and the construction of terraces on the slopes. The border zones between the mountains and the desert to their east, and the hills south of Hebron, were, however, suited to pasture and cultivation of cereals.

The valleys of Jezreel and Beth-Shean are the largest inner valleys in the country. Their abundant alluvial soil and water sources made them the natural granaries of the country, and consequently they were heavily settled in antiquity. The international route between Syria and Egypt passed through these valleys, and thus they were of particular strategic importance.

The narrow strip of land separating the mountains from the Jordan Valley becomes more and more arid as one proceeds southward from the Gilboa ridge, and south of Wadi Far'ah it becomes a desert. This desert region, south of Wadi Qelt, is called the "Judean Desert," and it played an important role in the history of the country due to its proximity to Jerusalem; it was utilized by pastoral nomads and was a natural shelter for refugees and rebels. Twenty kilometers in width, the Judean Desert is demarcated on the east by steep cliffs descending to the Jordan Valley and the Dead Sea, 400 m below sea level.

The Rift Valley, the longest and deepest natural fissure in the world, extends from northern Syria to eastern Africa and is one of the most vital geographic features in Palestine. It includes the Huleh Valley, the Lake of Galilee, the Jordan Valley, the Dead Sea, and the Arabah. The northern part of the Rift Valley, with its Mediterranean climate, played a significant role in ancient settlement and international traffic. The valleys of Beth-Shean and Succoth (the Damiah region, near the junction of the Jabbok River [Nahr ez-Zerkah] and the Jordan) were well adapted to agriculture and human habitation. The climatic conditions in the Rift Valley become worse as one proceeds south along the Jordan Valley, where settlements were established only in oases such as Jericho.

Several natural passes cross the Rift Valley to connect the western and eastern parts of Palestine One of the most important of these is the Damiah crossing of the Jordan, where the Wadi Far'ah route connects with the valley of Succoth and leads to the Jabbok River and the

Transjordan highland. Another important link is along the Yarmuk River south of the Lake of Galilee, and a third is east of Jericho.

Transjordan is divided into several subregions. In the north, it is bordered by Mount Hermon, 2,500 m above sea level, which is the most southern of the high ridges of the Anti-Lebanon. South of the Hermon are the basaltic Golan Heights, an offshoot of the vast volcanic regions of Bashan and Hauran. The Golan plateaus are divided by deep ravines, and on the south, the region is bordered by the deep gorge of the Yarmuk River. South of the Yarmuk is the Gilead ('Ajlun) highland, a fertile plateau conducive to settlement. Farther south are the plateaus of Ammon and Moab (south of Amman), which are quite arid. The Arnon River (Wadi Mujib) forms a natural obstacle to north-south traffic in the land of Moab, located east of the Dead Sea. Nahal Zered (Wadi Hesa) was also vital in antiquity, as it created the natural border between Moab and Edom. To its south, the mountains of Edom, reaching heights of over 1,600 m, extend to the Red Sea. The narrow, fertile Transjordanian plateaus are bounded on the east by the large eastern desert of Jordan, which extends to modern Iraq.

Although most of western Palestine enjoys a Mediterranean climate with sufficient rain and pleasant temperatures, conditions are more arid in the south. South of the Lachish Brook Wadi Suchreir) is the vast region of the northern Negev, covered largely by loess soils. The average annual rainfall in .he Judean Hills reaches 600 mm, but as one proceeds southward, the yearly amount decreases. In the region of the Besor and Gaza brooks it only approximates 250 mm, so farming is possible only in years of plentiful rain. In this region the southern extent of permanent settlement in the country fluctuated. Farther south and east, in the semiarid Beer-Sheba and Arad valleys, the environmental conditions were even more harsh, and habitation occurred only in selected periods.

South of Beer-Sheba, the Negev Desert comprises several distinct subregions. The central Negev highlands, bordered on the south by the great natural cavity of Machtesh Ramon and on the east by the cliffs of Machtesh Gadol and Nahal Zin, has an average annual rainfall of 60 mm. It is ideal for pastoralism, but agriculture was possible only by the use of sophisticated irrigation methods in exploiting winter floods. The Zin region, east of the highlands, and the southern Negev are more desolate, mountainous, and difficult to cross. Two major routes crossed the Negev from the north toward the Red Sea: that running through the Arabah Valley (the southern part of the Rift Valley), and the "Gaza Road," connecting Gaza and the Red Sea via the important oasis of Kadesh Barnea.

The Elath-Aqaba region at the head of the Red Sea was the important gateway to naval and caravan commerce with southern Arabia and eastern Africa. The sandstone strip north of

the granite mountains of this region contained copper ores, exploited several times in antiquity.

Invading armies, trade caravans, and messengers crossed strategically situated Palestine The Sinai Desert west of the Negev forms the natural barrier between Egypt and Palestine The 180 km separating the eastern branch of the Nile from el-Arish could be crossed only by way of the desert route across north Sinai, where substantial water sources were lacking. This route was the land bridge between Egypt and Asia, exploited during several historical periods. Its continuation became known as the "Via Maris" (The Way of the Sea). The latter extended up the coastal plain from Gaza to Aphek, bypassing the Yarkon River; it continued along the eastern edges of the Sharon Plain, running through Wadi 'Ara to the Jezreel Valley near Megiddo. From there one branch proceeded to the Beth-Shean Valley and Transjordan, another continued northward through Hazor toward Syria, and a third passed from Megiddo or across the Carmel to the valley of Acre and the Lebanese coast.

The second main international route, known as the "King's Highway," runs close to the border between the settled area and the desert in Transjordan. It was the main north-south communication axis in this region, connecting Syria with the Red Sea and Arabia.

The Mediterranean coast of Palestine is mostly straight and not convenient for anchoring. The few bays which could serve as natural ports are those of Acre, Haifa, Dor, and Jaffa. The river mouths such as those of the Na'aman near Acre, the Kishon near Haifa, the Yarkon north of Tel-Aviv and Nahal Lachish near Ashdod provided additional safe ports. The importance of the naval connections along the eastern Mediterranean forced the ancient peoples of Palestine to build port towns also in unconvenient places, especially along the southern coast (such as at Gaza and Ashkelon). This chain of ports enabled tight naval connections during various periods between Palestine, Egypt, the coasts of the Levant, Cyprus, southern Turkey, and the Aegean. The intensity of these connections changed from one period to the other, but in most of the periods under discussion in this book the naval connections of Palestine were an important factor in its economy and cultural development.

Thus, in spite of its small dimensions, Palestine, like the Levant in general, is a heterogeneous region, divided into well-defined areas of different ecological and environmental character. This is the background to the development throughout history of separate, rival geopolitical units, each with its own regime, ethnic features, and material culture. As a bridge between the centers of civilization in Egypt and Mesopotamia, Palestine was influenced by both these powers. It was also a pawn in the continuing struggle for control of the Near East between the great powers and in their hostile designs upon each other. The proximity of the country to the sea facilitated connections with the eastern Mediterranean civilizations, while the deserts on the east and south were the source of conflict between "the

desert and the sown," in which desert nomads invaded the fertile lands whenever a crisis or a collapse in government provided the opportunity.

Armis et litteris

The military equipment of early Roman Palestine, in light of the archaeological and historical sources

by

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Thesis submitted for the degree of Ph.D.

at the University of London

2007

Volume 2 – The catalogue

'...Rabbi said: Do not look at the jar, but at what is in it; there are new full of old, and old which do not contain even new'

(Avot 4.20)

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Group I (Roman conquest – Herodians)

I.1 – Qeren-Naftali

Map ref.: 2029 2774

Additional names: Khirbet Hurrawi, Khirbet el Hurrawi **PL. I.1-I.1A**

Reference: *TIRIP*, 209

Geography

The site is situated on a peak in the eastern Upper Galilee. It includes the remains of a fortress, circumvallation wall and possibly two siege camps (**PL. I.1: 1-2**). On the eastern slope of the hill the scanty remains of a village were observed. A sanctuary to Athena was detected in the latter, as well as two Greek inscriptions.

The altitude of the summit is 410m and raises some 400m above the Hula valley. The largest spring in the region – Einan spring – is situated at the foot of Qeren-Naftali. The site is located in a strategic point, of rare observation qualities, which controls the main road to the north and the western boundaries of the Hula valley; particularly the ascent from the valley to the nearby settlement of Cadasa (Tel Qedesh) (Aviam 1997; *TIRIP*, 209 – with bibliography).

History

The fortress and the adjacent village were first described in the late 19th century (Guerin 1880, 363-368). It was revisited by the Western Palestine surveyors, who reports of the existence of tombs as well as two Greek inscriptions, dedicated to Athena and Zeus Heliopolitanus, that were there found (Aviam 1997, 97). A short archaeological excavation was carried out in 1981 by Bahat, revealing in the village, walls dated to the early Roman period (*ibid.*). During the 'sites survey in Upper Galilee', the expedition, headed by Aviam, documented the outlines of the fortress and gathered pottery in the site. Based upon architectural parallels from Dor and Jotapata, Aviam dates the erection of the fortress to the Hellenistic period (2nd century BC). The evidence of the collected pottery, however, suggests a continuous occupation, of the late Hellenistic and Early Roman periods (*ibid.*, 98). Aviam links the latter date with Herod the Great military operations in the Upper Galilee. According to Josephus, three subsequent campaigns took place, against Marion of Tyre (*BJ* 1.238) Antigonus's supporters (*ibid.*, 1.304-319), and possibly during his invasion to the Galilee following the death of his brother Joseph (*ibid.*, 1.328-330). Aviam correlates the siege elements, the siege wall and two square enclosures (camps?), with the struggle between the

Galileans and Herod in which he suggests that the site shifted hands between the rivals for several times (Aviam 1997, 104).[1]

Militaria

Nine rolling stones were discovered within the boundaries of the site and its near vicinity. A group of seven stones was found near the southeastern corner of the fortress (**PL. I.1A: 1**). Additional two stones were detected in the nearby village, at the foot of the fortress (Aviam 1997, 98). The employment of rolling stones during the Hellenistic Herodian periods is attested at Dor (Shatzman 1995, 66 and note 44), Masada (**Pls. III.19W; III.19AB**) and possibly Herodium (Stiebel 2003a).

Catalogue

N. Rolling stones

1. Nine rolling stones **PL. I.1A: 1-3**
Site:.....Qeren-Naftali
Provenance:...Foot of the site
Expedition:....Aviam 1996
Reg. No.:.....Unknown
Material:.....Limestone
Dimensions –
Diameter:.....0.5m
Weight (1 stone):...156.5kg

Aviam reports the discovery of nine rolling stone (Aviam 1997, 98). The stones, made of the local limestone, exhibit the chiselling marks. The provenance of the stones suggests that the group of seven discovered at the fortress's corner represent an unused heap spaced at strategic point (compare: Masada, Herodium – Stiebel 2003a, 219, 220-221). The pair of stones that were observed at the foot of the site (**PL. I.1A: 1**), if not rolled down the slop in later period for secondary usage, may represent part of the enemy's deployment and possibly its attacking course (*ibid.*, 220-221, Fig. 6). These two stones are currently at the IAA stores in Beth Shemesh (**PL. I.1A: 2**). An examination of the stones revealed that one of the stones has a flat side, which allowed it to be comfortably position at the head of the fortifications (**PL. I.1A: 3**) (Griffiths 1992, Fig. 4).

[1] If correct, they may be compared with the remains of the early enclosures under and east of Camp C, at Masada, which I suggest associating with the siege of Antigonus in 40BC (*BJ* 1.286-287), rather than with the Roman pioneer force of AD73 as Gichon have proposed (Gichon 1995b).

I.2 – Hyrcania

Map ref.: 1847 1252

Additional names: Castellion; Kh. Mird

PL. I.2-I.2A

Reference: *NEAEHL* II, 639-641; *TIRIP*, 149

Geography

The Hasmonean-Herodian fort was constructed on top of an isolated hill at the western outskirts of the Hyrcania valley (*el-Buqeiah*), in the northern Judaean Desert. The hill, 248m above sea level, raises some 200m from its surroundings. Two aqueducts fed the site with water, in addition to three constructed large pools and some twenty-one water cisterns (**PL. I.2: 1-2**).

History

Josephus first notes Hyrcania as one of three forts that was occupied by Queen Alexandra (Salome), and used as a treasury (*AJ* 13.417). This stronghold was presumably erected by Alexander Jannaeus or even by his father John Hyrcanus, whose name it commemorates. Since the site still awaits excavations, most of the Hasmonean architectural elements are concealed. Nevertheless, remains of this period are visible in the water system, a fine example of which is the lower courses of the aqueduct's eastern bridge. The site came to ruin by Gabinius in 57BC (*BJ* 1.167). Herod laid siege upon Antigonus's sister in about the year 32BC (*BJ* 1.364), the occurrence to which Ze'ev Meshel relates the remains of the siege instillations that encircle the site (see below). Thereafter Herod rebuilt and used Hyrcania as a jail for his opponents.[2] The site that surmounts the hilltop is dominant by a rectangular complex (25x40m) that was constructed upon vaults. This area is occupied by peripheral rooms that flank an open stone paved court from three sides. The understructure spaces were used as water cisterns (*NEAEHL* II, 639-641; *TIRIP*, 149).

Militaria

A *ballista* ball was found in the vicinity of the siege system in Hyrcania (Meshel 1984a, 252, Pl. 27:1; Meshel 1995, 249). Meshel suggested that the remains belong to the siege work of Herod in 32BC (Meshel 1984a, 254-255; Shatzman 1991, 167). The length of the discernible remains of the *circumvallum* is 2700m, to which we may add a section of 800m long whose remains were untraceable during the survey (Meshel 1984a, 254) – 3500m altogether. At least one tower is integrated in the siege wall (*Ibid.*, 251, 254, Pl. 26:1-2), and in addition to an observation point it may have served as a shooting platform as well. The stone was found east of the fort, near section No. 10 of the *circumvallum* (**PL. I.2: 2**). Our

[2] The area served for the burial of Antipater son of Herod (*BJ* 1.664).

particular interest in the ball derives from its early context, as the artefactual evidence for the artillery in the Herodian period is rather scarce. Since the stone was left at the site (Meshel, *pers. comm.*), we can evaluate its diameter from the photo alone.

Catalogue

M. Torsion artillery

Ballista balls

1. *Ballista* ball **PL. I.2A: 1**
Site:.....Hyrcania
Provenance:...Surface find (siege system)
Expedition:....Meshel
Material:.....Limestone
Dimensions –
Diameter:.....~10-15mm (from the photo)

A photo of the object was published by Meshel (Meshel 1984a, 252, Pl. 27:1; Meshel 1995, 249). The limestone ball was found in a survey of the surroundings of the site, near the western section of the *circumvallum* (*ibid.*). Meshel speculated that the stone was shot from the fort at the besieging forces, thus providing additional evidence for the Jewish (or local) employment of torsion artillery machines (Shatzman 1989). Seemingly dating to the Herodian period it is of a special interest, as few dated military fittings from that time are documented. Unfortunately, being left in the field the stone was not available for examination and no further details concerning its exact diameter and weight were available.

I.3 – Jebel Abu Saraj cliff, Cave IV/17

Map ref.: 19030 14415

Other names: 'Cave with the Masonry Wall'[3]

PL. I.3

Geography and history

The natural cave (area: 33.5sq m; height: 1.4-1.7m) is situated in the east cliff of the Quruntul ridge, at the base of the Shivta Formation (**PL. I.3: 1**). Three springs flaw at the bottom of the cliff (Sion 2002, 43), the water of which was convoyed by aqueducts to the Hasmonean palacial compound at Tulūl Abū el-'Aliq, south of Jericho.

The cave has two entrances, which can be reached only by a ladder. The southern entrance was partly blocked by a masonry wall (**PL. I.3: 2**). Pottery from the Hellenistic period was found along with two coins from the Hasmonean coins (103-76BC and 129-7BC6), suggesting an occupation date between the first half of the 2nd century BC and the first half of the 1st century BC. The discovery of three trilobate arrowheads led the excavator to associate the finds with 'the time of the resistance to the Hasmonean dynasty' (Dadon 2002). However, this type of arrows which is to date unknown prior to the early Roman period, may indicate a mid 1st century date, around the introduction of Pompeius to the country (63BC) or possibly during Gabinius's campaign (52BC).

Militaria

Three iron trilobate arrowhead were found at the cave (Sion 2002; Dadon 2002). The significant of this find lies in the date of the assemblage. If correct, it is the earliest documentation of this type in Palestine, although I tend to adopt the later limit – mid 1st century BC, for at present the introduction of this type seems to corresponds the introduction of the Romans to the country.

Catalogue

I. Archery

Arrowheads

Iron trilobate arrowheads

1. Iron trilobate arrowhead **PL. I.3: 3**

Site:.....Cave IV/17
Expedition:....Sion (1993)
Provenance:...Survey – inside the cave
Material:.....Iron
Dimensions –
Length:.....44mm
Length of head:...25mm

[3] Survey 1993 – Northern Section, sub-section of fault escarpment, Unit 1, No. 10.

Length of tang:...~20mm (bent)
Width: 13mm

Iron trilobate arrowhead (Sion 2002, 64, Fig. 13: 2), strongly barbed (Subtype D). The tip of the head is damaged and the tang is bent due to impact. Like other examples of this subtype it is small in dimensions (Stiebel 2003a).

2. Iron trilobate arrowhead **PL. I.3: 3**
Site:.....Cave IV/17
Expedition:.....Dadon (1993)
Provenance:.....Cave
Excavation No.:...B.656.17
Material:.....Iron
Dimensions –
Length:.....49mm
Length of head:...35mm
Length of tang:....14mm
Width: 13mm

Iron trilobate arrowhead (Sion 2002, 64, Fig. 13: 1), slightly tapering (Subtype C). The tip of the head is damaged and the tang is slightly bent due to impact. The vanes have suffered from corrosion.

3. Iron trilobate arrowhead
Site:.....Cave IV/17
Expedition:.....Dadon (1993)
Provenance:.....Cave
Excavation No.:...B.656.20
Material:.....Iron
Dimensions –
Length:.....40mm
Length of head:...30mm
Length of tang:....10mm
Width: .....Unknown

Iron trilobate arrowhead (Sion 2002, 64). Reported to be similar to previous arrowhead, but no illustration was provided.

I.4 – Jericho, Tulūl Abū el-'Aliq

Map ref.: 1920 1400

Other names: Hiericho

PL. I.4-I.4D

Reference: *NEAEHL* II, 682-691; *TIRIP*, 143-144

Geography and history

The biblical site of Jericho was situated some 10km north of the Dead Sea (250m below sea level), in the eastern limit of Judaea, on the road leading to Jerusalem. It is an oasis that is positioned in a very arid area (250m below sea level), which depended on the water of the spring of Elisha (Ein el-Sultan). The city became the capital of its district during the Persian period, and kept this position in the periods that followed. It seems that from the time of Alexander the Great, the district of Jericho became the personal property of the rulers. It was famed in the ancient world for the quality of its dates and most notably its most profitable *balsam* plantations. In addition to the waters of the Elisha spring, during the Hellenistic and Roman periods, five aqueducts fed the royal estate, most notably from the perennial springs of Na'aran (Wadi en Nu'eima) and Wadi el Qelt.

The Hasmonaean rulers and most notably Herod expanded the boundaries of the city constructing near the riverbanks of Wadi el-Qelt a palacial compound, the inhabitants of which enjoyed the comfortable climate and the proximity to Jerusalem. In addition, Herod erected in the city entertainment facilities (*AJ* 17.161, 194; *BJ* 1.659), part of which were uncovered by Netzer between 1973-1986 and 1986-1987 (**PL. I.4: 1-2**).

The prominent economical and strategic position of Jericho is exemplified by the forts that were erected in the environs of the site which was apparently desired by the neighbouring kingdoms. The long tension between Herod and Cleopatra around the balsam plantation climaxed during the days of Mark Antony, resolving only by the rise of Augustus to power. Part of the site was burnt down following the death of Herod by his slave Shimon (*BJ* 2.57), and was rebuilt by Archelaus (*AJ* 17.340). During the reign of the procurators, Jericho was seemingly a Caesarian estate. A Jewish community occupied the site during the Second Temple period and following the destruction of the First Revolt. Jericho surrendered to the military force of Vespasian in AD68 (*BJ* 4.439ff). Part of the army was left to winter in the city (*ibid.*, 486). A small Roman villa that was constructed in Tulūl Abū el-'Aliq between the revolts, which came to ruins in the Bar-Kochba revolt.

Militaria

In addition to a very rare cart fitting, the extensive excavations project carried out by Netzer, unearthed few military equipment finds, among which one may count: scales, arrowheads, shafted weapons and two *ballista* balls. A 2nd century BC sheathed sword that

was found in a tomb near the Hippodrome of the nearby Tel Samarat and exhibits direct relation with the *gladius Hispaniensis* was recently published (Stiebel 2004a).

Catalogue

A. Helmets

1. Helmet handle (?) **PL. I.4A: 1**
Site:.....Jericho
Provenance: .....Swimming pool
Expedition:.....Netzer
Excavation No.:...AC 19-8035
Material:.....Copper-alloy
Dimensions –
Width:.....85mm
Height:.....50mm
Thickness:...7x7mm

Rhomboid-sectioned carrying handle, tapering to both looped 'acorn' terminals. For a discussion of the validity of this identification, see: Chapter 3 (i) *d.* Parallels: Gamala (III.3/A.7), Masada (III.19/A.6-13), Kh. Qumran (III.17/A.1) and Legio (V.3/A.1).

B. Armour

Scale armour

1. A pair of iron scales **PL. I.4A: 3**
Site:.....Jericho
Expedition:.....Netzer
Provenance: .....The Southern Tell (3rd Palace)
Excavation No.:...B154-300/2
Material:.....Iron
Dimensions –
Total length:.....30-30.5mm
Width:.....20mm
Diameter of hole:...2mm
Weight:.....1.96-1.91gr

A pair of identical iron scales, one of which is partly damaged. Both exhibit flat faces with no mid-rib. A very thrift attachment method was used, merely a pair of holes is spaced in the upper part of the scales. The scales were uncovered in the fill of the Third Palace, the context of which clearly belongs to the time of Herod (*Jericho* I, 297, 298, Plan 46). An additional fragmentary pair was found at the site (see next item). Apart from the 'spare' scales from Masada that have seemingly originated in this period as well, the scales from Jericho are the only examples which derive from a clean Herodian context.

2. A pair of iron scales **PL. I.4A: 4**
Site:.....Jericho
Expedition:.....Netzer
Excavation No.:...B 130

Material:.....Iron
Dimensions of scale A –
Total length:.....29mm+
Width:.....22mm
Diameter of hole:...2-3mm
Dimensions of scale B –
Total length:.....25mm+
Width:.....20mm
Diameter of hole:...2mm

Two incomplete iron scales with a pair of attachment holes in the upper section, similar to the previous pair. It derives from Zone B – the Herodian Third Palace Complex ('Opus Reticulatum Palace').

D. Military dress and footwear

Caliga

1. Hobnail **PL. I.4A: 2**
Site:.....Jericho
Expedition:.....Netzer
Excavation No.:...AB 12-8333
Material:.....Iron
Dimensions –
Length of head (bent):...21mm
Diameter of head:.....13mm
Height of head:.....7mm
Shank:.....3x3mm

Iron hobnail with bent shank. It appears to be early in date dating to the first half of the 1st century BC (*Jericho* I, 116, Plan 14). Parallels: Masada (Yadin 1965, 91), Siege camps, Masada (III.20/D; Gutman 1964, 115), Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-3), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

F. Edged weapons

Swords

1. Sword (*gladius Hispaniesis*) (not illustrated)
Site:.....Jericho
Expedition:.....Netzer
Provenance: .....Tomb
Excavation No.:...AE54-8182
Material:.....Iron
Dimensions –
Overall length:.....890mm
Length of tang:.....130mm

Length of blade:.....760mm
Length of point:.....130mm
Width of blade:.....590-510mm
Thickness of blade:...12-15mm
Scabbard chape:.....11x9mm
Thickness of chape:...3mm
Diameter of ring:.....25-26mm (external) 8mm (internal).

For the sword: Stiebel 2004a.

Scabbards

2. Reeded scabbard mount **PL. IV.4A: 5**
Site:.....Jericho
Expedition:.....Netzer
Provenance: .....Herodian garden
Excavation No.:...A(L) 486-8145/1
Material:.....Copper-alloy
Dimensions of fragment A –
12x18mm
Diameter of hole:...2mm
Dimensions of fragment B –
11x20mm
Diameter of hole:...1mm

Two fragments of reeded mount of a sword's scabbard. The copper-alloy strap has a mid-rib. Each strap has a single attachment hole. The objects were uncovered in a trench in the Herodian garden of the Lower Wing of Herod's Second Palace (*Jericho* I, 195, Plan 29).

H. Shafted weapons

Spears

1. Spearhead **PL. I.4A: 6**
Site:.....Jericho
Excavation No.:...AB18-8354
Material:.....Iron
Dimensions –
Length:.....145mm
Diameter:.....16mm
Thickness:.....3mm
Width of head:...31mm+

Leaf-shaped spearhead with a prominent mid-rib and damaged perimeter. A close example was found at Masada (III.19/H.1). It was found in a sounding made south-west of the Pools' complex (*Jericho* I, Plan 14).

2. Ferrule **PL. I.4A: 7**
Site:.....Jericho
Expedition:.....Netzer
Provenance: .....Swimming pool (A(C)94)
Excavation No.:...AC 19-8039/1
Material:.....Iron

Dimensions –
Length:.....102mm
Diameter:....32mm
Thickness:...2mm

Tapering iron ferrule that was uncovered in a swimming Pool AC 94 (*ibid.*, 57-58, Plans 12, 14). In addition to and a helmet (?) carrying handle (I.4/A.1), the object was found together with one *ballista* ball. Hence, it may alternatively be identified not as a ferrule but rather as a *catapult* head, similar to those uncovered in the Citadel of Jerusalem from the mid-2nd century BC.

I. Archery equipment

Arrowheads

1. Arrowhead (not illustrated)
Site:.....Jericho
Provenance: .....Side room of the western courtyard (north wing of the 3rd palace)
Excavation No.:...B80-200
Material:.....Iron (?)

An arrowhead is mentioned in the registry list. It was found in a side room of the western peristyle court (north wing of the 3rd palace) (*ibid.*, Plans 34, 36).

2. Arrowhead (not illustrated)
Site:.....Jericho
Provenance:.....Pool
Expedition:.....Netzer
Excavation No.:...F278-6053
Material:.....Iron (?)

The discovery of an additional arrowhead is mentioned in the inventory list. The item was uncovered in a long and narrow pool that was built during the early years of Herod's reign north of the Na'aran Coduit's northern sidewall (*Jericho* II, 126-128, Ills. 164-165).

M. Torsion Artillery

Ballista balls

1. *Ballista* ball **PL. I.4B: 2**
Site:.....Jericho
Provenance: .....Swimming pool
Expedition:.....Netzer
Excavation No.:...AC 19-8041
Inv. No.:.....1710
Material:.....Limestone
Dimensions –
Diameter (min.):....145mm
Diameter (max.):...160mm
Weight:.....4.0kg

The limestone ball was found inside one of a pair of swimming pools just west of the Northern Tell (*Jericho* I, 57-58, Ill. 84). Together with it the excavations' records indicate the unearthing of an 'iron ferrule' (see above I.4/H.2). In addition the helmet (?) carrying handle was uncovered in the swimming pool.

2. *Ballista* ball **PL. I.4B: 2**
Site:.....Jericho
Provenance: .....Industrial area
Expedition:.....Netzer
Excavation No.:...F84 – 2555/2
Material:.....Limestone
Dimensions –
Diameter:.....153mm
Weight (damaged):...4.0kg
Estimated weight:.....6.66kg

The limestone ball was found sliced presumably as a result of impact; some 60% of it has survived. It was unearthed in a room in Area FD (*Jericho* II, 116-117, Plan 17), which was erected in Phase 3a – the early days of Herod's reign (*ibid.*, 133, Plan 21).

3. *Ballista* ball (not illustrated)
Site:.....Jericho
Provenance: .....Palace, Room 2
Reg. No.:.....32.1035
Material:.....Flint
Dimensions –
Diameter:.....0.075m

The discovery of a slightly chipped flint ball in 1932 at 'Room 2 of the Palace' is mentioned in the Mandatory archaeological records. It was unavailable for examination.

Catapult bolts

1. *Catapult* bolt **PL. I.4B: 1**
Site:.....Jericho
Provenance:.....Pool, Industrial Area
Reg. No.:.....F44-3588
Material:.....Iron
Dimensions –
Length:.....115mm
Length of head:.....46mm
Length of socket:.....69mm
Width:.....23mm

A socketed iron bolt. The corroded item slightly expands at its head. It was uncovered in Pool F44 (*Jericho* II, 58-60, Ills. 72-73, Plan 12). The pool went out of use during Phase 4a (AD48-70).

K. Sling

Slingshots

1. Slingshot (not illustrated)
Site:.....Jericho
Provenance:.....Swimming pool
Expedition:.....Netzer
Excavation No.:...A(B)101-867
Material:.....Lead

The inventory record notes the discovery of a leaden slingshot, which was not available for examination. The shot was discovered in the large swimming pool at Area AB – the Pools Complex, at Jericho (*Jericho* I, 70ff, Plan 14: 18-19/46-49).

V. Military chariots and cart fittings

1. Cart fitting **PL. I.4C: 1 – I.4D: 1-3**
Site:.....Jericho
Provenance: .....Unknown
Expedition:.....Netzer
Excavation No.:...Unknown
Material:.....Copper alloy and lead
Dimensions –
Height:.....90mm
Width:.....77mm
Depth:.....63mm
Triangular hole:.....17x18mm
Diameter of cylindered body:...44mm
Weight:..... 1012.95gr

The cast copper-alloy cart fitting has a lead core. It may be identified with the 'wings that are made for ornament' (Kel 14.5) of the wagon. At first glance the object appears to be a winged creature. Closer examination of its central part reveals substantial resemblance to a rearing cobra with a dilated hood and upraised head. These features are typical of the Egyptian Cobra (*Naja haje*) and the Black-necked Spitting Cobra (*Naja mossambica pallida*). Hence, the sequentially divided vertical band is the horizontal row of ventral (belly) shields or scales of the cobra (Johnson 1990, Figs. 4-5). Moreover, the pointed protrude feature of the object from Jericho is akin to the pointed head of the poisonous snake. The short incised groove visible upon this element appears to represent the depression on the serpent skull, between its eyes (see the Graeco-Roman snake: *ibid.*, Fig. 15).[4] The oblique lines that exit from it seemingly stand for the head plates (*ibid.*, Fig. 12 and Cat. 7, Figs. 80-81). In the Near East the celebrated serpent is known from Egypt, where one may find numerous artistic representations of it. Does the object that features clear Egyptian affinities and was uncovered in a Herodian context at Jericho reflect influence of Queen Cleopatra on the district during

[4] See also the head of the *uraeus* of the Great Sphinx *cf.* Johnson 1990, Figs. 165, 170 and 172.

this period time (*BJ* 1.361-362; *AJ* 15.88ff)? The rarity of this object is even more exceptional in light of the fact that roads were introduced to Judaea by the Flavian army some 100 years later.

A similar object, in the image of a griffon, was found in Strageath (UK) (Wilkes and Frere 1989, 146, No. 50, Fig. 74), while others are reported for example from Morocco (Boube-Piccot 1980).

I.5 – Cypros

Map ref.: 1904 1392

Additional names: Qipros; Tell el 'Aqabeh; Tharex (?) **PL. I.5**

Reference: *NEAEHL* I, 313-317; *TIRIP*, 149

Geography

The site of Cypros is situated on the head of Tell el 'Aqabeh, south of the outlet of Wadi Qelt where it flows into the valley of Jericho (**PL. I.5: 1**). The site dominants the ancient main road, which linked Jericho with Jerusalem.

History

In 1974, the site was excavated under the management of E. Netzer and I. Damati for one season (Netzer 1999, 62-66; *Jericho* II, 233-285). Located on two levels – an area of 40x45m on the top of the Tell and a 3-dunam enclosure, situated 30m below the Tell's head – the site of Cypros was first settled on the Hasmonean period, as one of the series of fortified palaces of the Hasmonean dynasty. Most of the remains of that stage are still covered by Herodian architecture. It was suggested to identify Cypros either with the fort of Trekes or Taurus mentioned by Strabo of Amaseia (Strabo 16.2.40; Netzer 1999, 66). The site was seemingly destroyed by Pompeius in 63BC. It was later rebuilt as a splendid fortified palace, and in King Herods' tradition on a grand scale (*BJ* 1.407, 417; *AJ* 16.143) and named after his mother.
The strong configuration, mainly uncovered on the upper part of the fort, is stated by the excavators to manifest the Jewish conquest on the beginning of the First Revolt as described by Josephus (*BJ* 2.484). Long after its destruction, the name of the site was used to designate the nearby Wadi Qelt (*Qipros nahar* – 'river of Cypros'), as is attested in *Lam R* 1.16.

Militaria

A bone arrowhead was uncovered in the site, seemingly dating from the time of Herod.

Catalogue

I. Archery equipment

Bone arrowheads

1. Bone arrowhead **PL. I.5: 2**
Site:.....Cypros
Provenance:.....Gravel fill
Expedition:.....Netzer and Damati (1974)
Excavation No.:...B. 371 (Inv. No. KY 15)
Material:.....Bone
Dimensions –
Length:.....35mm+

Length of head:.....32mm+
Length of tang:.....3mm+
Diameter of tang:...3mm
Body:.....7x5.5mm
Weight:.....1.35gr

The bone arrowhead has a rectangular cross-section and circular cross-sectioned tang. Oblique production marks are seen on the faces of the arrowhead. The tip of the head is chipped and most of the tang is missing. Such a head, with a triangular cross-section was found seemingly in a refuge cave of the Second Revolt, now in the Hecht Museum (VI.2/I.5). A circular cross-sectioned example was found at Herodium (Stiebel 2003a, No. 7 – with references to the West), while the Deutsch collection (VI.7/I.1) contains one painted bone head of a pyramidal cross-section.

I.6 – Samaria

Map ref.: 1680 1870

Additional names: Sebaste; Sebastiya; Shomron

PL. I.6-I.6B

Reference: *NEAEHL* IV, 1300-1310; *TIRIP*, 220-221

Geography

The city of Samaria was named after Mount Samaria on which Omri, King of Israel, built his capital (1 Kings 17.23-24). It is situated on a high hill (430m), which dominants it surroundings, as well as the main road that leads from Neapolis (Shychem) northward. The city is located in the midst of a cultivated fertile land (**PL. I.6: 1**).

History

The city was founded as the ancient capital of Israel – Shomron. Alexander the Great settled the city with thousands Macedonians soldiers. In 108BC it suffered a devastating destruction by John Hyrcanus (*AJ* 13.275-283). Pompeius annexed the city to the Roman province of Syria (63BC), and it flourished under the reign of Gabinius (57BC). In 30BC the city was granted by Augustus to Herod the Great (*ibid.*, 15.217; *BJ* 1.396). He rebuilt the city in about 25BC, and named it Sebaste after Augustus (**PL. I.6: 2**; *ibid.*, 1.403; *AJ* 15.292-293; Shatzman 1991, 180, note 36). Herod settled there 6000 colonists (*BJ* 1.403; *AJ* 15.296; Shatzman 1991, 181 and note 38). Samaria became a focal point for soldiers' residence and recruiting. The city seemingly provided recruits to the army of Herod the Great. During the first half of the 1st century AD an auxiliary unit – *Ala Pia Gemina Sebastena* – was formed from enlisted Samaritans (Spaul 1994, 195-197).

Militaria

Scrutinising the reports of the main two archaeological expeditions to Samaria, one may reveal a relatively significant number of *militaria* of the Roman period, large part of which was not recognised as such. In addition to shafted arms (*pila* heads), arrowheads and artillery projectiles, we may count armour fittings, dress elements, belt fittings and frogs, as well as a unique short sword/dagger sheath, haversack mount and harness fittings (**PL. I.6A-I.6B**). All the artefacts were not available for examination, but the haversack mount that I have examined in the PEF archives, London. None of the artefacts can be associated with certainty to a historical episode. The finds from Samaria are of interest, as military artefacts from civil cities were not commonly recognized in Palestine, unlike in the West.

Catalogue

B. Armour

Laminated armour

1. Tie-hoop **PL. I.6A: 1**
Site:.....Samaria
Expedition:.....Harvard 1910
Excavation number:...4486
Provenance:.....Samaria's land (surface find?)
Material:.....Copper alloy
Dimensions –
Length (damaged):....56mm+

Published as a 'handle-hook from bronze vessel' (Reisner, Fisher and Lyon 1924, 363, XIV: 4a, Fig. 237). The object is actually a tie-hoop of a '*lorica segmentata*'. Missing its edge, only one attachment hole has survived, while its fastening rivet did not preserve. The relatively large dimensions of it are most akin to two examples from Gamala (III.3/B.14-15), and see also Kh. Qumran (III.17/B.1).

D. Military dress and footwear

Caliga hobnails

1. Fragmented *caliga* sole **PL. I.6A: 2**
Site:.....Samaria
Provenance:.....L. T. 3 b
Expedition:.....Harvard 1908-1910
Excavation No.:...2032
Material:.....Iron
Dimensions –
Total height:.....15-25mm

Described merely under the category of 'iron tuck or ornamental stud, with large head (Reisner, Fisher and Lyon 1924, 350: 5) the iron objects are in fact studs of *caligae*. The most distinct example is the present group of six studs, that had corroded together (*ibid.*, Pl. 82: k 10). It represents part of a *caliga* sole whose leather parts have long decayed. These studs feature the distinctive dome-shape head with a short spike. A very similar group of corroded studs has been unearthed in Kh. as Salantah (V.32/D.3). For parallel in Palestine: siege camps, Masada (III.20/D; Gutman 1964, 115), Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-2), Kh. Hillel (V.34/D.1-2), Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

2. *Caligae* studs (not illustrated)
Site:.....Samaria

Provenance:.....L. T. 3 b
Expedition:.....Harvard 1908-1910
Excavation No.:...2032
Material:.....Iron
Dimensions –
Total height:.....15-25mm

Three hobnails. Similar to previous item.

F. Edged weapons

1. Dagger/short sword scabbard **PL. I.6A: 3**
Site:.....Samaria
Provenance:.....Herodian Gateway
Expedition:.....Harvard 1909
Registration No.:...2726 and 2727
Material:.....Copper alloy
Dimensions –
Length:.....100mm + 66mm
Estimated length:.....265mm
Width (max.):.....*c.* 24mm
Diameter of suspension rings:....16mm
Thickness of suspension rings:...3mm

Two fragments of a copper-alloy scabbard were uncovered in association with the Western Gate that was erected by Herod. Hence the scabbard may be dated to the period between 25 and 4BC. It was unearthed in angle with a silver frog (I.6/G.1).

The scabbard was composed of two copper-alloy plates, one of which overlaps and soldered to the second plate. The scabbard features two asymmetric lobate suspension loops. This method is paralleled by Spanish examples (Connolly 1997, Fig. 13B), further attested by an Augustan example from Titelberg (LU) (Metzler and Weiler 1977, Fig. 31, 1). This fact appears to strengthen our above offered date of the very early years of the Principate.

Published as a sword scabbard (Reisner, Fisher and Lyon 1924, 355; 9a, Fig. 226), judging the article's dimensions, it seems that the object sheathed a short sword or a dagger. A very close complete parallel is reported from the southern sector of the Judaean mountains is part of the Jeselsohn collection (VI.10/F.1).

G. Belt fittings

1. Belt mount **PL. I.6A: 4**
Site:.....Samaria
Provenance:.....The Ganymede house
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...QE 91
Material:.....Copper alloy
Dimensions –
Length (from the drawing):...60mm
Width (from the drawing):....23mm

An openwork plate of a curvilinear floral design was found in Samaria (Kenyon 1957, 450, Fig. 108: 7). Published merely as an ornament, it is part of a 2nd century belt mount, examples of which are known from Dura-Europos (SY) (Frisch 1949, 22, Nos. 55-56, Pl. V), Tomis (RO) (Petculescu 1998, 153, Fig. 1: 1) and Schirenhof and Pfünz (DE) (Oldenstein 1976, 132-133, Nos. 242-245, Taf. 32). A near complete set, found at Neuburg (DE), provides the full image of such belt (Hübener 1963/64, 20, Abb. 5).

Frogs

2. Silver dagger frog (not illustrated)
Site:.....Samaria
Provenance:.....Gateway (Roman)
Expedition:.....Harvard 1909
Excavation No.:...2750
Dimensions –
Length:.....20mm+
Width max.:....17mm

This 'triangular piece...' (Reisner, Fisher and Lyon 1924, 366) that has been found in angle to the dagger's sheath (above F.1) was identified as an object 'from a harness ornament or something similar' (*ibid.*). However, the immediate relation with the sheath clearly suggest the object is part of the suspension assemblage of the dagger. The article is a fragmented shank of a type popularly known as 'button and loop' fasteners. This un-committing term encompass various objects, most probably of varied functions. Nonetheless, among them in several European sites one finds examples of shanks with circular head that are no doubt associated with edged arms – Canterbury (UK) (Goodburn 1977, 471, Fig. 19). In Palestine, frogs were found at Samaria (next item) and Masada (III.19/G.1-18; and III.20/G.1).

The use of silver in the Samaritan example strengthen its identification as belt frog, since the Roman fondness of the white metals is well attested in particular with belt mounts and accessories alike.

3. Copper-alloy frog **PL. I.6A: 5**
Site:.....Samaria
Provenance:.....S7-773
Expedition:.....Harvard 1908-1910
Excavation No.:...4513
Dimensions –
Total length:.....*c.* 34mm
Height:.....*c.* 8mm
Thickness of head:.....*c.*2.5mm (?)
Length of shank:.....23mm
Maximum width of shank:...22mm
Thickness of the shank:.....2mm
Diameter of head:.....23mm

A copper-alloy triangular shank with a circular head. In spite of the fact that the object was assigned to the Iron Age (Reisner, Fisher and Lyon 1924, 361; X 5, Fig. 233; 5a), it seems to be of a Roman origin, particularly in the view of the absolute absence of parallels from the entire Levant if the Iron Age (Amihai Mazar, *pers. comm.*) and evident resemblance to Roman frogs. For parallels see previous item.

H. Shafted weapons

Pila

1. *Pilum* **PL. I.6A: 6**
Site:.....Samaria
Provenance:.....Cistern (S9 – cistern 1)
Expedition:.....Harvard (1910)
Registration No.:...4406
Dimensions –
Total length:.....290mm+
Diameter of shaft:...11mm
Length of head:.....58mm
Thickness of head:...13mm

A *pilum* with a square cross-sectioned head and a broken circular shaft. Found in a water cistern, the excavators assigned it to the Hellenistic period (Reisner, Fisher and Lyon 1924, 348, Fig. 218, 2[a]). However, the fact the head was found in a water cistern cannot over rule the possibility it is an intrusive find from the Roman period. Another *pilum* head was uncovered at Samaria (see next item). In addition, parallels were uncovered in Yoqne'am (II.2/H.1), Wadi Murabba'ât (V.16/H.1) and Khirbet-el 'Aqd' (V.9/H.1). Two collets were found at Gamala (III.3/H.1-2) (see also Chapter 4 (iii) *b*).

2. *Pilum* **PL. I.6A: 7**
Site:.....Samaria
Provenance:.....Summit – Area QN
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...Q 4364
Dimensions –
Total length:.....120mm+
Thickness of shaft:...4x6mm
Length of head:.....86mm
Thickness of head:...34mm

Originally published as a *pilum* head, the iron projectile was paralleled with the *pilum* from Richborough (UK) (Kenyon 1957, 457, Fig. 112: 1). The shaft is rectangular in cross-section. It is unclear from the publication what is the shape of the head. For parallels see previous item.

I. Archery equipment

Iron arrowheads

1. Iron bodkin arrowhead **PL. I.6A: 9**
Site:.....Samaria
Provenance:.....S8-821
Expedition:.....Harvard 1910
Excavation No.:...4515
Dimensions –
Total length:.....55mm
Length of head:.....31mm
Length of tang:.....14mm
Thickness of head:...6x6mm
Diameter of tang:....3mm

Bodkin tanged iron arrowhead with a square cross-section (Reisner, Fisher and Lyon 1924, Fig. 218: 10). See also next item. Such arrowheads are found in both First and Second Revolts' contexts: Meroth (III.1/I.1-7); Gamala (III.3/I); Magdala (III.4/I.1); the Site of the Caves (III.5/I.1-35); Sandal Cave (V.14/I.1); the Spear Caves (V.17/I.1).

2. Iron bodkin arrowhead **PL. I.6A: 10**
Site:.....Samaria
Provenance:.....Summit of area Q
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...K 19 T III (Level III)
Dimensions –
Length:.....46mm
Thickness of head:...6x6mm
Length of head:.....38mm
Length of tang:.....8mm

An iron bodkin arrowhead (Kenyon 1957, 457, Fig. 111: 20). See previous item.

3. Iron flat arrowhead **PL. I.6A: 8**
Site:.....Samaria
Provenance:.....Summit (disturbed level)
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...Q 1302
Dimensions –
Total length:.....29mm+
Thickness of head:...2mm

Flat arrowhead. Damaged tip (Kenyon 1957, 457, Fig. 112: 2). Examples were uncovered in both First and Second Revolt contexts.

L. Accessories

Haversack

1. Haversack mount **PL. I.6B: 1**
Provenance:.....Area Bn
Expedition:.....The Joint Expedition 1931-1935

Excavation No.:...B 546
Location:.....PEF (London)
Dimensions –
Height:.....12mm
Diameter (external):....39mm
Diameter (internal):.....20mm
Thickness of ring:.....4mm
Dimensions of head:...12x4mm

The cast copper-alloy item with the projecting bulb was described as a 'ring with flat back, curved surface, hook attached to surface' (Kenyon 1957, 450, Fig. 108: 5). However, it appears to relate to a group of fittings known as early as the European Iron age (Celtic origin), up to the 1st century AD (see parallels below). The shape of the projecting bulb made it ideal for fastening leather straps. Several interpretation as to the object's function have been raised, varying from baldric hook (Werner in Wild 1970, 138, No. 5), through a mean of attachment of a scabbard to a waist belt (Collis 1973), to a fastening device of a waist-belt or harness straps (Jackson 1990, 39). Among experimental archaeologists and re-enactors it is widely excepted suchlike items were used, during the Principate, as a fastening gadget of the military leather haversack (**PL. I.6B: 5**; Fuentes 1991, 79-80, Appendix A – 90-96). Should this notion is accurate the Samaritan ring is the sole eastern example of the military satchel. Describing the Roman kit, Josephus notes that each soldier was equipped with three days ration (*BJ* 3.95) that was seemingly packed in such a bag as seen for example on Trajan's Column (Scene IV).

Parallels: Camerton (UK) (Jackson 1990, 38-9, Pls. 7-8: 80-1), Broxtowe (UK) (Webster 1958, 71, No. 14), Waddon Hill (UK) (*ibid.*, 145, No. 11; Webster 1979, 66, No. 3), Caerleon (UK) (Fuentes 1991, 93, note 185), Colchester (UK) (*ibid.*), Hod Hill (UK) (Brailsford 1962, Pl. XI, I 197), Kelvedon (UK) (Wickenden 1988, 254, Fig. 5, No. 31), Wanborourne (UK) (Anderson and Wacher 1980, 122, Fig. 4, No. 3).

Q. Riding equipment

1. *Phalera* **PL. I.6B: 2**

Site:.....Samaria
Provenance:.....Area Dc, extreme Northeast corner
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...D 188
Dimensions –
Diameter:.....30mm
Height:.....12mm
Thickness:...10mm

The slightly domed *phalera* has a central attachment hole. It is decorated by a dozen-petalled rosette (Kenyon 1957, 450, Fig. 108: 6).

2. *Phalera* **PL. I.6B: 3**

Provenance:.....Samaria
Expedition:.....The Joint Expedition 1931-1935
Excavation No.:...Q 4991
Dimensions –
Diameter:...33mm
Height:.....11mm

A relatively high domed circular *phalera* with a central hole. The flange is defined by a central circular line (Kenyon 1957, 450, Fig. 108: 8). *Cf.* Masada (III.19/Q.5).

3. Spur **PL. I.6B: 4**
Site:.....Samaria
Expedition:.....Harvard 1910
Excavation No.:...S2 II 68 (Reg. No. 3100)
Material:.....Copper-alloy
Dimensions –
Length:....60mm
Width:....55+mm
Prick:.....12mm

A looped copper-alloy spur with a circular-sectioned prick (Reisner, Fisher and Lyon 1924, 354, Fig. 225: 5a). The lateral hole is semi-circular. One of its ends is broken. The spur was found in Hellenistic context. Three iron spurs were found at Gamala (III.3/Q.3-5) and a possible further fragmentary example comes from Herodium (Stiebel 2003a, 236-237, No. 148, Fig. 21).

I.7 – Jerusalem, House of Caiphus (Beth Caiphus)

Geography and history

PL. I.7-I.7D

Between 1971-1972, excavations were carried out in the courtyard of the Armenian monastery (Broshi 1972), which is situated in the southwestern hill of Jerusalem, known as Mount Zion (**PL. I.7: 1-2**).[5] This area was adjacent to the palace of Herod, the monumental podium of which *c.* 130x330m occupied a substantial part of the western sector of the Upper-City of Jerusalem.

Militaria

A sheathed sword was unearthed at a water cistern. In the preliminary report of the excavation it was associated with the assaulting forces of Titus that stormed this sector in 8th Elul AD70 (Broshi 1972, 105-106; see below).[6] Unfortunately, no further details are available concerning the culture material found in the water cistern. Typologically, the sword belongs to the *gladius Hispaniensis* type, which clearly pre-dates the First Revolt period. Therefore, if not a heirloom, one should reconsider the excavator's dating, presumably associating the sword rather with a Herodian context.

Catalogue

F. Edges weapons

Swords

1. *Gladius Hispaniensis* **PL. I.7A-D**

Site:.....Jerusalem, House of Caiphus
Provenance:.....Water cistern
Expedition:.....Broshi 1971
Excavation No.:...Unknown (IAA No.: 95-342)
Material:.....Iron, copper alloy, wood and leather
Dimensions –
Overall length:.....930mm
Length of blade:.....*c.* 730mm (point is concealed)
Width of blade (at shoulders):.....54mm
Length of tang:.....135mm (150mm with fragmented pommel)
Tang:.....10x10mm – 12x20mm
Thickness of sheathed sword:.....15-20mm
Diameter of upper pair of rings:...11mm
Diameter of lower pair of rings:...11mm
Thickness of rings:.....5mm
Length of tip of scabbard:.....50mm

[5] I thank Magen Broshi for the permission to study the sword and Shimon Gibson for providing the information regarding the excavation.
[6] An illustration of the sword, based on the latter source, appears in Connolly 1983, 74.

The sword clearly belongs to the *gladius Hispaniensis* type. It was found sheathed in its scabbard, the organic components of which have preserved – a remarkable case in the excavations in Jerusalem. The overall length of the sheathed sword is 930mm. The length of the blade is *c.* 730mm. Most of the blade is concealed by the sheath, therefore little can be said about it. Hopefully, forthcoming X-ray photos of the object will provide us with further details. The double-edged blade is 54mm wide and exhibits a flat oval cross-section. The tang is slightly bent in relation with the blade. The long tang (135mm) still retains in its centre scant remains of the bone grip. In addition, breccia-like debris that adhered to the upper part of the now lost pommel provides us with its negative. The reconstructed width of the pommel was *c.* 60mm (**PL. I.7A: 1-2**). The tang is square in cross section. It evolves to a sloping shoulders and the two-edged blade. The sword's scabbard comprises an iron U-guttering frame to which adhere a wooden layer coated by leather. A depressed band-like feature is observed on the upper rare face. It is possibly the negative of the scabbard's locket mount (**PL. I.7B: 1**). The graining of the wood components indicates the use of elongated planks, of seemingly plywood, which were laid longitudinally (**PL. I.7B: 1-2**). Three transverse copper-alloy bands, decorated by embossed dots (**PL. I.7D: 1**), floral and fishbone designs, reinforce the lower half of the scabbard (**PL. I.7C: 1**). The upper band (alternating pair of fishbone pattern) is located – 340mm from the shoulders, the second band (1mm dots along its perimeter) – 480mm and the third band – 620mm. The scabbard tapers to a much corroded bulbous-tip (50mm long) (**PL. I.7C: 2**). It was fastened to the belt by two pairs of rings. The upper pair is located 130mm from the shoulders, while the lower pair is 250mm below the shoulders.

A small copper-alloy tack, with a seemingly circular head, was found together with the sword (diameter of head: 16mm; thickness of head: 3mm; length of stem: 13mm).

I.8 – Nahal David, Cave 2

Map ref.: 185 097

Reference: *NEAEHL* III, 833 **PL. I.8**

Geography and history

Cave 2 is part of a cluster of burial caves from the Second Temple period uncovered in the lower part of Nahal David. Still awaits final publication, the caves were dated to the 1st century BC (Avigad 1962, 183). This group of caves was claimed to predate the Herodian period, although a similar burial cave that was excavated by Yadin north of Nahal David, and also found contained the typical inlaid remains of wooden coffins, had been assigned to the Herodian period upon the pottery testimony (*NEAEHL* III, 833).

The caves were hewn in the *havar* formation, located in the northern cliff of the canyon (**PL. I.8: 1**). The cave consists of a small chamber that formed a receptacle for bones (Avigad 1962, 182). The human remains were thrown in disorder along with several utensils, like juglets, lamps, a bronze ladle and two wooden bowls.

Militaria

A very rare sheathed iron *sica* was found in the cave.

Catalogue

F. Edged arms

Daggers

1. *Sica* **PL. I.8: 2**

Site:.....Cave 2
Expedition:.....Avigad (1961)
Excavation No.:...Unknown
Material:.....Iron
Dimensions –
Blade:
Length of blade:.....19mm+
Width of blade:.....33mm
Thickness of blade (swollen):...19-24mm–
Weight of blade:.....46.48gr+
Sheath:
Length of sheath:.....195mm+
Width of sheath:.....32mm+ (large part is missing)
U-guttering binding:.....10mm
Thickness of binding:.....3mm
Inner space of binding:.....4mm
Loop (inner dimensions):.....13x3mm
Thickness of loop:.....6mm
Weight of sheath:.....46.95gr+

The unpublished material from Cave 2 retained a curved iron dagger on its sheath. Missing most of its tang, the double curved blade suffered from corrosion, hence it has a slightly

swollen section. The blade was set in a curved U-guttering frame, one arm of which is missing. The distal part of the frame was looped out, allowing the suspension of the sheath. The front part of the sheath was decorated by medial triangular stem. The iron frame was probably wrapped with an organic material, most likely leather which did not survive.

Historically, it is reported by Josephus to be the weapon of the rebellion group of the *sicarii*. Very few *sicae* are known from the Roman Empire. In addition to the artistic representations of the weapon as equipping gladiators (Junkelmann 2000a, Figs. 20, 39; Ewigleben 2000, Fig. 150), merely one, wooden, *sica* from Oberaden (DE) is published as a training arm of gladiators (von Schnurbein 1979). Additional ferrous example was found in Kh. Qumran, presumably dated to the destruction of AD68 (III.17/F.1). For the *sica* in the Roman world and particularly in Judaea, see: Chapter 4 (i) *b*.

II.1 – Tiberias

Map ref.: 201 242

Reference: *NEAEHL* IV, 1464-1473; *TIRIP*, 249-250 **PL. II.1**

Geography and history

The city of Tiberias was founded on the western shore of the Sea of Galilee in *c.* AD18 by Herod Antipas and honours the emperor Tiberius. In AD61 the city was annexed to the kingdom of Agrippa II and during the eruption of the First Revolt, it was fortified by walls (*BJ* 2.573) that still stood erect subsequent to the Roman conquest. Ever since AD100 Tiberias came under the direct Roman rule and during Hadrian reign a temple honouring his name was erected in the city. The only clear remains from the early principate were found at its south boundary, where a free standing gate and a road, presumably from the time of the erection of the city, were found.

Militaria

A bone model of a gladiatorial dagger was found at Tiberias. The small object bears a striking resemblance to the hilt assemblage of the gladiatorial dagger.

Catalogue

P. Gladiatorial equipment

1. Gladiatorial dagger model **PL. II.1: 1**
Site:.....Tiberias
Provenance:.....Unknown
Excavation number:...Unknown
Material:.....Bone
Dimensions –
Length:.....40mm

Published as brooch (Ayalon and Sorek 1999, 31, Fig. 30), the bone object was modeled after the outlines of the gladiatorial dagger, with its typical grip. The semi-circular pommel and handgrip are identical to those of the *sica* from Oberaden (DE) (**PL. II.1: 2**).

II.2 – Yoqne'am

Map ref.: 1604 2289

Other names: Tel-Jokneam; Camona; Tell Qamun

PL. II.2

Reference: *NEAEHL* III, 805-811; *TIRIP*, 96

Geography and history

The site of ancient Yoqne'am, is situated within the junction of several major roads, of north Palestine, used as from antiquity to date (**PL. II.2: 1-2**). The mound is placed in the outlet of Milh pass, where the latter meets the Jezreel Valley. The strategic location was one of the factors that attracted inhabitants ever since the Early Bronze Age up to the Mamluk period. Archaeological excavations took place in the mound between 1977 and 1988 by an expedition of the Hebrew University of Jerusalem headed by Amnon Ben-Tor (Ben-Tor 1993, 805-811; Ben-Tor, Avissar & Portugali 1996).

The Roman period in Tel-Yoqne'am is literally unknown. Out of mere remains of a mausoleum (*ibid.*, 32, Plans VIII.1, VIII.4, section VIII.1), no section of a settlement from that period was uncovered during the excavation. A few Early Roman pottery sherds (Avissar 1996a), 1 oil-lamp fragment (Avissar 1996b, 191) and several coins (Meshorer 1996, 239) are also reported to be found. Taking into consideration the sparse find from the Roman Period with regard to the ample evidences known from Yoqne'am Illit, a hill south to the mound, the excavators assumed that the settlement in the Roman period have moved there, in all likelihood in the 1st century BC (Ben-Tor 1993, 806; Avissar 1996, 59; on finds from Yoqne'am Illit *cf.* Gibeon 1964, 14). It should be noted that at Tel Qiri (1610 2278), 2kms south to Yoqne'am, a level of the Early Roman period was exposed. A structure was there found to exist between the mid-1st century BC to the end of the 1st century AD, a period to which a tomb (T. 1952) was also assigned (Ben-Tor *et al.* 1987, 9-11, 20-26). It appears that during the Early Roman period a village occupied the site.

Though somewhat speculative, the equipment that was unearthed at Tel Yoqne'am may be associated with the strategic location of the site on the western border of the Plain of Jezreel. Discovering a legionary arm, such as the *pilum*, possibly hints that a small contingent of legionaries stationed at the strategic point of Yoqne'am. This notion is not far fetching, considering that the major military site in the period was Legio, only 9.5km to the south.

Militaria

The military oriented articles, uncovered in the excavations, are confined to projectile heads. In the final report, all eight objects were classified as arrowheads (Khamis 1996, 218-219). However, the dimensions of two heads, clearly exhibit they are far too large for

arrowheads and thus should be identified as shafted weapons. Carefully examined, one of these heads is apparently proven to be of Roman origin – a *pilum*.

Catalogue

H. Shafted weapons

1. *Pilum* head **PL. II.2: 3a-b**

Site:.....Yoqne'am
Provenance:.....Fill
Expedition:.....Ben-Tor
Excavation No.:...Area A H/26, L. 1832; Reg. No. 3067
Dimensions –
Total length:.....127mm
Width of the head:.....27mm

Published as an iron arrowhead (Khamis 1996, 219) the head was paralleled, and thus dated, with late arrowheads: 'This type is also common at early medieval sites but continues to appear in the Crusader and Mamluk periods...' (*ibid.*). True, the pyramidal design was popular in the iron arrowheads of these periods. Nonetheless, one must reject Khamis's identification due to the exceptional length of the so-called tang and classify this object beyond any doubt as a *pilum*. This is clearly attested by the head's bodkin shape and in particular by the length of its haft. Its tip is bent due to impact, whilst the broken haft is deformed.

II.3 – Ascalon (marine site)

Other names: Ashkelon **PL. II.3-3A**

Reference: *NEAEHL* I, 103-112; *TIRIP*, 68-70

Geography and history

Ascalon was a famous port-city.[7] Two Roman detachments, an *ala* and a *cohors*, are attested at Ascalon in AD66 (*BJ* 3.12). These units were seemingly related to the re-stationing of the Roman forces following the initiation of the First Revolt (Shatzman 1989, 470). A battle that raged in the vicinity of the city is narrated by Josephus (*BJ* 3.15). A tombstone of Avlus Instolius Tanx, *centurion* of *legio X Fretensis* is reported from the city. As marine archaeology concerns, a Greek helmet was found in the sea near Ascalon (Radan 1958, 185-188, Pl. 32c). During the winter storms of 1998 a wreckage of a Roman ship from the late 1st century – 2nd century AD was detected and excavated by Galili and Sharvit (IAA).

Militaria

The finds included a straight copper-alloy trumpet.

Catalogue

R. Military wind instruments

1. *Bucina* **PL. II.3: 1-5, II.3A: 1**

Site:.....Ascalon (underwater site)
Provenance:...Wreckage
Expedition:....Galili and Sharvit (1998)
Material:.....Copper alloy
Dimensions –
Length:.....900mm+ (750 and 150mm)
Width:.....56mm
Length of skeletal tubes:...*c.* 130mm

A wreckage of Roman ship, which was uncovered in 1998, contained material dated between the second half of the 1st century AD to the beginning of the 2nd century AD. Among the finds was a straight copper-alloy trumpet (**PL. II.3: 2**).[8] It was found in two fragments. The longer part of the two is a 750mm long copper-alloy tube, which flares into a conical bell, the end of which is now missing (**PL. II.3: 1**). The second fragment, 150mm long, consists of the mouthpiece and part of the body (**PL. II.3: 3, 5**). The mouthpiece was not removable. The *bucina* exhibits a simple construction; a long and narrow band of metal (56mm wide) was

[7] The word scallion bears the name of Ascalon that was the port from which this product was exported in ancient times.

[8] It was excavated by Dr. Ehud Galili head of the Marine Archaeological Department of the IAA, to whom I am most grateful for entrusting me the study of the object.

folded, and the stitch was soldered, to create the tube. The band was bent over three solid copper-alloy tubes, *c.* 130mm long and 3mm thick, that acted as the skeleton of the instrument's body (**PL. II.3A: 1**). Compared with the complete bell of the trumpet from Zsámbék (HU) (1280mm+), one may estimate the overall length of the *bucina*, in about 1400-1500mm (**PL. II.3A: 2-3**). The length of the *salpinges* was rather similar, an ivory example from Boston Museum of Art is 1570mm long (Comotti 1989, 73).

The mouthpiece is a cast of copper alloy. Having the outlines of a wide cup, it fitted over the lips of the blower (**PL. II.3: 3, 5**). The central hole is crowned by raised circular pattern (**PL. II.3: 4**). The mouthpiece gradually narrows to the dimensions of the circular tube body. This type of mouthpiece is utterly different from the detachable mouthpieces that are associated with the *cornu* that is described below and exhibit tubular elongated outlines. The *bucina*, gripping device (**PL. II.3B: 1-5**), and its association with the musical instruments of the Temple are disscused in a chapter that was excluded from the present version.

Group II (Provincia Judaea)

III.1 – Meroth

Map ref.: 1997 2705

Other names: Kh. Marrus (Marish)

PL. III.1-III.1A

Reference: *TIRIP*, 184; *NEAEHL* III, 1028-1031

Geography and history

The site of Meroth is situated in the eastern boundary of the Galilee and is mentioned by Josephus to mark the border between the Upper Galilee and the Tyrian territory (*BJ* 3.40). According to Josephus, the city of Meroth was one of the sites that were fortified by him during the preparations to the First Revolt (*BJ* 2.573; *Vita* 188; Aviam 1983, 36). During the survey and excavations parts of the fortification of the city were observed (Ilan and Damati 1987, 31-42). In addition to a section of the wall and two towers, a moat and possibly a section of a siege wall were described (**PL. III.1: 1**). Four hiding complexes are further noted with the boundaries of the site, and the excavators suggested associating the site with a cluster of 18 caves visible at the nearby Mount Evia'tar (Map ref. 1980 2750), where pottery from the First Revolt was gathered.

Militaria

According to the excavators, all the unearthed military equipment appears to date from the First Revolt. A dozen of iron tanged heads were reported from the site, the data concerning only eight of which was available. The heads were found next to the wall section in the east, and in the fill under the synagogue's floor, which contained material as early as AD70 (Ilan and Damati 1987, 38). Contrary to the observation of Jodi Magness, cited by Ilan and Damati, none of the heads were *pila* heads, and the all the alleged *catapult* bolts were actually square and rhomboid cross-sectioned arrowheads, but presumably one example.
One flint *ballista* ball, of a small calibre, was uncovered at the mouth of the Eastern hiding complex, indicating the employment of artillery during the Roman conquest of the site.

Catalogue

I. Archery

Iron arrowheads

According to the preliminary report a dozen of iron missile heads were found near the wall section in the East as well as in the synagogue. The heads were erroneously identified by Magness as *pila* heads and *catapult* bolts (**PL. III.1: 2, III.1A: 1**). The alleged *pilum* head (Ilan and Damati's: No. 1) is a tanged *catapult* bolt, while the rest of the seven heads are

tanged bodkin heads, two of rhomboid cross-section and four of square cross-sectioned. The only exception seems to be Ilan and Damati's No. 7, which due to its weight was probably a *catapult* bolt. The tapering tang of Ilan and Damati's – No. 1, negates its identification as a *pilum* head. These square cross-sectioned arrowheads belong to the more robust examples of this type. One trilobate arrowhead that weighs at least 7.36gr (broken tang) is documented in Herodium (Stiebel 2003a, No. 16). Thus, it appears that the weight of 7-9gr was still valid for an arrowhead.

1. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...L. 69; B. 1275
Material:.....Iron
Dimensions –
Length:....63mm
Width:.....6mm
Weight:...7.7gr

Very narrow head.

Parallels: Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 382 – ample bibliography on p. 24).

2. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...L. 69; B. 1425
Material:.....Iron
Dimensions –
Length:....58mm+
Width:.....10mm
Weight:....8gr

Corroded head, with very short tang, presumably broken.

3. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...L. 7; B. 107
Material:.....Iron
Dimensions –
Length:....52mm
Width:.....12mm
Weight:....8.4gr

Similar to previous. Blunt tip due to impact, rhomboid cross-section. Tapering tang whose end is missing.

4. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)

Excavation No.:...L. 133; B. 1625
Material:.....Iron
Dimensions –
Length:....58mm
Width:.....7mm
Weight:...7.8gr

Complete head, Square cross-section. Blunt tip due to impact.

5. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...L. 54; B. 1131
Material:.....Iron
Dimensions –
Length:....43mm
Width:.....10mm
Weight:...7.9gr

Similar to previous. Part of the body is badly corroded. The tip of head is missing and the tang is possibly broken.

Parallels: similar to previous.

6. Iron arrowhead
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...L. 61; B. 1137
Material:.....Iron
Dimensions –
Length:....44mm
Width:.....8mm
Weight:...7.4gr

Similar to previous. Tips of head and tang are missing.

M. Torsion artillery

Ballista balls

1. *Ballista* ball **PL. III.1A: 2**
Site:.....Meroth
Provenance:.....Mouth of hiding complex
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...Unknown
Material:.....Flint
Dimensions –
Diameter (estimated):....~100mm

A flint ball was found at the entrance to the eastern hiding complex (Ilan and Damati 1987, 34, photo on p. 35). According to the published photograph, the stone appears to belong to the small calibre ammunition, with the estimated measure of *c.* 100mm. It provides an illustration to the Roman employment of the artillery even during in the sieges of smaller settlements – *cf.* Kh. Ziphiyon of the Second Revolt (V.8).

Catapult bolts

PL. III.1: 2, III.1A: 1

2. Iron bolt
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987)
Excavation No.:...Unknown
Material:.....Iron
Dimensions –
Length:....87mm
Width:.....19mm
Weight:....39gr

A bodkin *catapult* tanged bolt. The dimensions of the head and more significantly its weight indicate with certainty that the head was that of a *catapult*, for it is too large and heavy to be identified as an arrowhead. The short tapering tang rules out its identification as a *pilum* head. It has a rhomboid cross-section rather then the more common square shape.

3. Iron bolt ?
Site:.....Meroth
Expedition:.....Ilan and Damati (1981-1983, 1984-1987, 1984-1987)
Excavation No.:...L. 95; B. 1433
Material:.....Iron
Dimensions –
Length:.....45mm+
Length of head:...42mm
Length of tang:....3mm+
Width:.....10mm
Weight:.....13gr+

This head is smaller in comparison with the previous item. It also exhibits a square cross-section rather than rhomboid. Parallels are known for example in Vindonissa (CH): Unz and Deschler-Erb 1997, Nos. 427-458 – with ample bibliography on p. 25.

III.2 – Jotapata

Map ref.: 1763 2486

Other names: Iotapata; Jodapatha; Yodefat

PL. III.2-III.2A

References: *TIRIP*, 154

Geography and history

Jotapata has a prominent place in the Josephus account of the Jewish War. The siege of the site in AD67, the defence of which was under his commend, was given a very detailed descritpion (*BJ* 3.141-288, 316-408, 432-442). The site is located some 22km south-west of Acre (Ptolemais) and 9km north of Sepphoris. It is situated on a hill surrounded on three sides by steep ravines, accessibly only from the north. This accords well the Josephus's narration, including the fact that it lacks a natural source of water (*BJ* 3.181, 186).

The surveys and more prominently the excavations that commenced at the site since 1992 have established the identification of the site with ancient Jotapata. The site which came to ruins in AD67 was never re-settled. The near by Kh. Shifat (Jifat) which appears to conserve the ancient name of Yodefat was occupied from the early Roman to the Byzantine period and in the mediaeval times. The excavations revealed clear evidences for the war that raged at the site, pointing out the NW sector as the major fighting zone (Adan-Bayewitz and Aviam 1997; Aviam 2002) (**PL. III.2: 1**). Among the noteworthy find were human bones accumulated in a water cistern seemingly the bones of the defenders (Aviam 2002, 129-132).

Militaria

Two years ago I was able to briefly review the material and taking some notes, with the kind assistance of Mordechai Aviam. However, due to certain differences of opinion between the IAA and the excavator, the material was unavailable for a detailed study during the time of writing.[9] The published preliminary reports specify the discovery of military equipment, part of which in clear battlefield contexts.

Catalogue

B. Armour

Josephus specifically mentions the Roman armour in his account of the siege of Jotapata (*BJ* 3.271-275). Some 2-3 tie-hooks of '*lorica segmentata*' girdle plates were unearthed in the excavations.

D. Military dress and footwear

[9] Following the permission of Aviam it is due to be published by me during 2005-2006.

1. *Caliga* hobnails **PL. III.2: 2**

Two dome-head *caliga* hobnails were uncovered in the excavations.

F. Edged weapons

The fragment of a *pugio*'s blade was found at Jotapata (Chapter 4 (i) *b*). It is the tip of a typical two-edged blade with a medial rib. Parallels are known throughout the Roman West (Scott 1985, 152-154; Bishop and Coulston 1993, 74; Obmann 2000; Unz and Deschler-Erb 1997, 18, Nos. 177-190, Taf. 10).

H. Shafted weapons

A much corroded iron spear-butt or possibly a spearhead is included in the metal finds. It still awaits cleaning.

I. Archery

Josephus notes the important place *sagittarii* had during the battle of Jotapata. Among the participating forces he explicitly refers to Arab bowmen (*BJ* 3.168, 211, 262). The commonest find at Jotapata were the arrowhead. Interestingly, trilobate arrowheads were found embedded in the mortar layer that composed the Roman rampart (**PL. III.2A: 1**). Some 70 heads altogether were uncovered in the excavations; most of which belong to the iron tanged trilobate type (**PL. III.2: 3, III.2A: 2**), but few are iron bodkin heads. The distribution of the heads involves the uncovering of 26 specimen along the northern fortifications and 27 heads from the residential areas (Aviam 2002, 128). Five heads were uncovered on the floor of the 'frescoed room' reflecting the fight with in the boundaries of the city. The preliminary report specified the distribution of 42 heads, indicating: 'that the brunt of the attack came from the NW, the most accessible side:

Area	1	2	3	4	5	6	Surface	Total
No. of arrowheads	9	21	1	4	3	0	1	42

K. Sling

In addition to pebbles (*cf.* III.20/K), two leaden pellets were found on the surface.

M. Torsion artillery

Josephus provides a very detailed narration of the use of artillery at Jotapata, noting the employing of 10 large and 55 light artillery machines by each legion (3.196-197, 242-245). The preliminary report notes the uncovering of 35 *ballista* balls, throughout the excavated

areas (**PL. III.2A: 3**; Aviam 2002, 129). A slight different number was initially noted in the *JRA* report (Adan-Bayewitz and Aviam 1997, 162):

Area	1	2	3	4	5	6	Surface	Total
No. of *ballista* balls	14	8	1	10	7	3	2	15

Interestingly, only small calibre shoots were uncovered to date (Aviam, *pers. comm.*); the largest ball is 230mm in diameter and weighs 2kg, where as the smallest example is 80mm and weighs 650gr (*circa* 2 pounds).

Catapult bolts

15 iron bolt heads were uncovered throughout the site (**PL. III.2: 3 – upper left**). Their lengths range from 80-150mm and weigh: 20-30gr (Aviam 2002, 128).

N. Rolling stone

One rolling stone was exposed in the top layer of the Roman ramp (*ibid.*, 127).

III.3 – Gamala

Map ref.: 2198.2566

Other names: es Salam; es Sanam ('the hump'); Gamla

PL. III.3-III.3AR

Reference: *NEAEHL* II. 459-463; *TIRIP*. 128

Geography

A detailed description of the city is provided by Josephus:

> 'From a lofty mountain there descends a rugged spur rising in the middle to a hump, the declivity from the summit of which is of the same length before as behind, so that in form the ridge resembles a camel; whence it derives its name, the natives pronouncing the sharp sound of that inaccurately. Its sides and face are cleft all round by inaccessible ravines, but at the tail end, where it hangs on to the mountain, it is somewhat easier of approach; but this quarter also the inhabitants, by cutting a trench across it, had rendered difficult of access. The houses were built against the steep mountain flank and astonishingly huddled together, one on top of the other, and this perpendicular site gave the city the appearance of being suspended in air and falling headlong upon itself. It faced south, and its southern eminence, rising to an immense height, formed the citadel; below this an unwalled precipice to the deepest of the ravines. There was a spring within the walls at the confines of the town' (*BJ* 4.5-8).

The site of Gamala was identified by Y. Gal in 1968, a notion that was confirmed by Sh. Gutman's survey in 1970 and his large-scale excavations that commenced in 1976 (**PL. III.3: 1-2**).

History

Gamala is listed in the Mishnah among the fortified cities from the time of Yehoshua Ben Nun (Arak 9.6). It is situated in the Lower Golan (*BJ* 4.2) and first mentioned in the narration of the campaign of Alexander Jannaeus against the Golan and the Gilead (Galaad) (83-80BC), that conquered the site and replaced it's governor (*ibid.*, 1.105; *AJ* 13.394-397). Gamala is noted among the cities that were repopulated by the order of Gabinius that aimed to restore order in the country (56BC). It was in the territory Agrippa II kingdom (*BJ* 2.568). During the preparations of the First Revolt, Agrippa laid siege upon the city which was removed by the rebels of the Galilee including the participation of Josephus as the military commander of the Galilee. Gamala was fortified by Josephus, who writes that he built there a wall (*ibid.*, 2.574). On October 12, AD67 the city came under the siege of the Roman army. Three legions and an auxiliary force under the command of Vespasian struggled to subdue the

city (*ibid.* 4.11-83; Suet. *Tit.* 8.2.4). Following the breach of the wall, the first Roman attack went awfully wrong, resulting in numerous casualties and in a near escape of Vespasian. It was only a month later (November 10) that the Romans managed to tumble down a tower in the wall and entered the city under the lead of Titus. The inhabitants fled to the rocky peak of the ridge, fighting against both the Romans nature. A wind bursts, which commonly blows hard in this sector, 'carried against them the arrows of the Romans and checked and deflected their own. Owing to the force of the gale they could neither stand on the edge of the precipices, having no firm foothold, nor see the approaching enemy' (*BJ* 4.76-77). The capture of the city was completed in the death of four thousands by the Roman swords and five thousands that 'plunged headlong with their wives and children into the ravine which had been excavated to a vast depth beneath the citadel' (*ibid.* 4.79).

Militaria

The finds of military fittings and weapons from Gamala are second only to Masada in diversity, whereas some categories, like iron arrowheads and *ballista* balls, are represented in far more great numbers at Gamala. The importance of the finds from Gamala draws beyond their contribution to our typological knowledge of *militaria* from the early Principate. The spatial distribution study of the finds faithfully reflects the raging battle, as abandoned by the Romans and the deployment of the different forces. Confronted with the account of the battle, which is the eyewitness testimony of Josephus, this data grants us with a unique opportunity to gain a better understanding of the course of battle and the tactics employed in the fight.

Catalogue

A. Helmets

Several artefacts that relates to the headwear category were uncovered at Gamala, most notably a cheekpiece and a browguard directly associated with L. Magus's panoply.[10]

Infantry helmets

Coolus helmet

1. Cheekpiece (*buccula*) **PL. III.3B: 1 – III.3C: 1-3**

Inv. No.: Area T; L. 4019; B. 1937-A

Dimensions – Width: 113mm; Height: 142mm (153mm with hinges); Thickness: 7mm; Diameter of hinges: 8mm; Diameter of hinges' holes: 2mm; Diameter of the head of rivet on

[10] It should be noted that the assertion that finds from L4019 retained a visor helmet (Syon 2002, 145) has no legs unless it is merely an ill use of terminology that was intended to describe the discovery of the browguard.

front: 12mm; Length of bent rivet shank: 10mm; Diameter of the heads of rivets on rear: 6-7mm; Weight: 213.5gr.

2. Browguard **PL. III.3D: 1-2, E: 1**

Inv. No.: Area T; L. 4019 (A3); B. 1546

Dimensions – Maximum width of object: 232mm (inner width: 193mm); Width: 19-21mm; Height: 12mm; Height of ends: 13mm; Thickness of end: 7mm; Diameter of holes: 3mm; Diameter of securing rivet's head: 10mm; Thickness of head: 1.5mm; Weight: 105.4gr

The assemblage from L4019 retained two exquisitely well-preserved parts of one helmet: a cast copper-alloy right check-piece and a browguard. The helmet belongs to the Coolus type (Robinson 1975, 26ff), also referred to as the Haguenau type (Feugère 1994, 81-85). The faces of the fine quality fittings are both tinned[11], exhibiting the Roman fondness of glittery and showy appearance.

The cheekpiece from Gamala bears striking resemblance to those of the two near identical helmets from Schaan (LI). This pair of helmets, one is now lost, was claimed to date from the late 1st century BC – the early 1st century AD on the basis of stylistic consideration (Robinson 1975, 29, 31, Pls. 41-43). However, in light of the Gamala specimen that originated in a well-dated context Robinson's typology of the Coolus type appears to be too rigid.

The design of the cheekpiece (*buccula*) follows the line of the jaw on the rear and lower edges. Semicircular cut-outs for the mouth and eye enabled the wearer to freely converse as well as good eyesight. An embossed border defines the rear and lower edges in addition to the cut-outs and is emphasized by a 2mm wide groove, while the upper edge has a slightly protrude border. The two parts of the hinge jut out from the upper edge. The check-piece was attached to a, currently vanished, wide hinge plate (41mm) that was riveted to the bowl. Ten holes are spaced along the *buccula* perimeter, most of which (2mm in diameter) were clearly intended to secure its lining. Leather is commonly noted as the material used to line the inner face of the protecting devices. Indeed, leather lining of a greave was found at Vindonissa (CH) (Gansser-Burckhardt 1942, Abb. 23). Nevertheless, leather had its disadvantages being very uncomfortably when wet. It seems that textile and vegetal materials were in use for lining more than appreciated before (Robinson 1975, 144).[12] One large tinned flat-headed rivet survived on the upper edge. The large hole (4 mm in diameter) towards the mouth cusping was intended for the fastening that secured the helmet below the chin. Cheekpieces were fastened by a chin-strap or tie, in order to prevent them from flapping on the soldier's

[11] Mathew Ponting (*pers. comm.*). They are not silvered (Gutman 1994, 64, 85, 97, 98) or silver-plated (Syon 2002, 145), as was previously asserted.

[12] An example of flax padding was recently identified among the material unearthed in a small fort on the Coptos-Berenike road – Didymoi (Hero Granger-Taylor – *pers. comm.*).

face. The complete examples from Schaan shed light upon the method that was employed at Gamala. A leather strap seemingly suspended from a ring, which was riveted to one cheekpiece. It was laced onto a pointed mushroom-like feature that protrudes from the other (Robinson 1975, 41-43). The large hole that is located precisely at the same point as on the Schaan examples, either held the ring or the flange noted above.[13]
Helmet check-pieces (לחיים) are explicitly noted in the *Mishnah*: 'A helmet is susceptible to uncleanness but the cheekpieces are not susceptible; but if they have a cavity that will hold water they are susceptible' (Kel 11.8). The somewhat slightly concaved surface of the Gamala example illustrates the ending of the *halachah*, which discusses the purity of check-pieces. The commonly flat design of a cheekpiece implied its status pure, for it was not a receptacle. However, if its construction allowed it to hold even merely water, the cheekpiece status was determined impure.

The tinned browguard acted as a reinforcing element of the copper-alloy bowl, protecting the helmet against cuts to the front. It was riveted at each end to the side of the bowl. The object is of a right-angle section and tapers into the points of attachment, exhibiting triangular ends. Robinson suggested that browguards of right-angle outlines were produced in Italy (Robinson 1975, 26, 31). Unlike the great resemblance to the cheekpieces of the so-called Coolus C, the construction of the type's brow reinforces differs from the Gamala specimen. It is very close to the reinforcing bars of the Coolus D and E (*ibid.*, Pls. 46-47, 49, 59-61). The added protection was seemingly intended to enforce the relatively weak structure of the bowls that were produced in spinning technique (Bishop and Coulston 1993, 191).
Examination of the browguard from Gamala indicated that it is deformed, exhibiting a swell with a marked 'scar' that runs obliquely left to its midpoint. The cause for this twist was clearly a blow of an edged arm that came from above and left and was absorbed by the browguard of L. Magus's helmet. This relic from the fight that raged at Gamala concord well the skeletal finds from Wisby, which exhibit distinct dominancy to cuts to the top left of the skull (Goldsworthy 1996, 220-221; on head injuries: Salazar 2000, 13-15). Indeed, many of Rome opponents used slashing rather than thrusting blows, which was practiced by the Roman army and presented optimal utilization of the two edged sword with it prominent point (Veg. 1.12; *cf.* Goldsworthy 1996, 217).

Three scenarios may explain the existence of this type of helmet at Gamala of the First Revolt. If we accept Robinson's classification, the cheekpiece and browguards may have furnished a latter Coolus type helmet – i.e. Type D (Robinson 1975, 31, Pls. 46-53). Indeed,

[13] We cannot be more precise, as the small flanges of Schaan helmets were attached to both the right and the left check-pieces.

the browguard of this type is similar to the right-angled Gamala specimen. Can the cheekpiece from Gamala be the missing link, filling in the gap in our knowledge concerning the shape of Coolus Type D's cheekpiece? The second scenario challenges Robinson's typology, and following Feugère suggests a less rigid chorological typology (Haguenau Type: Feugère 1994, 81-86). If we accept, on the other hand, the early dating of the parallels from Europe, the find from Gamala provides further illustration to the lastingness of weapons, and most notably that of helmets. This phenomenon is exemplified by the multitude number of ownership inscriptions that are found on individual Roman helmets in West.

A copper-alloy *tabula ansata* (below E.6) that was found in direct association with the panoply's remains notes the name of its owner and its units. The tag was not attached to the helmet, as was asserted by Gutman (Gutman 1994, 98 and photo on p. 73), but rather to the soldier's shield.

3. Helmet edge-binding **PL. III.3E: 2**

Inv. No.: Area T; L. 4031; B. 1970/1

Three copper-alloy fragments of U-guttering edge-binding. The binding of both the check-pieces and the neck-guard became very common ever since the second quarter of the 1st century AD. The perimeter of the complete infantry helmet from the Hebron district, dated to the Second Revolt, is entirely edged by U-guttering binding (Robinson 1975, Pls. 176-178). The curved outline of one of the Gamala's fragments indicates it either sheathed the lateral edge of a neck-guard or the lower front part of a cheekpiece. Additional flattened fragments that were found in this locus (next item) may be similarly identified, although their classification as U-binding of swords' scabbards is applicable as well. A tie-hoop (B.34) was further uncovered in this locus

Dimensions – Over all length: 250mm+; Width: 3x3-5mm; Thickness: 0.5mm.

4. Helmet edge-binding **PL. III.3E: 3**

Inv. No.: Area T; L.4031; B. 1970-2

See previous item.

Dimensions – Over all length: 237mm+; Width: 5-6mm; Thickness: 0.5mm.

Ear-guards

Unlike part of the specimens of the Coolus/Haguenau type that had large, nearly square, cheekpieces which covered the ears, the outlines of the subsequent types Weisenau or the Imperial-Gallic and Imperial-Italic showed a clear trend towards enhancing the soldier hearing by leaving the ears exposed (Feugère 1994, 88-97; Robinson 1975, 45-74). In order to protect the ears from slashing blows, ear-guards were fitted between the cheekpieces and the

neck-guard.[14] Both plain and ribbed examples are documented (Ulbert 1969a, 42, Nos. 2-6, Taf. 30). The ear-guard from Gamala was seemingly soldered to the bowl, though ear-guards were commonly riveted.

5. Ear-guard **PL. III.3E: 4**

Inv. No.: Square P; B. 1005 (Gamala 1980)

Plain ear-guard. The tinned object was cut from a copper-alloy sheet and thereafter hammered to the desired shape. No attachment holes appeared to exist, and though both its ends are partly damaged, it seems as if the ear-guard was soldered to the bowl.[15]

Parallels – Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 590, 595, Taf. 28, with bibliography on p. 28).

Dimensions – Length: 50mm+; Width: 36mm; Height: 18mm; Thickness: 0.5mm.

Carrying handles (?)

6. Carrying handle **PL. III.3F: 1**

Inv. No.: Area T; Square T: 9-10; B. 1000-B 1.

Rhomboid-sectioned carrying handle, tapering to looped 'acorn' terminals. The handle is slightly distorted. For the identification and alternative options (Chapter 3 (i) *d*). It was found outside the wall.

Parallels: Masada (III.19/A.6-13) – with ample bibliography; Jericho (I.4/A.1), Kh. Qumran (III.17/A.1) and Legio (V.3/A.1).

Dimensions – Height: 31mm; Width: 48.5mm; Thickness: 3mm.

7. Carrying handle ? **PL. III.3F: 2**

Inv. No.: Area B; L. 1295; B. 271

Rhomboid-sectioned carrying handle, tapering to looped 'acorn' terminals. The handle is rather large, therefore should not necessarily be identify as helmet's carrying handle. See previous item. The object was found in Area B, in 1st century BC context.

Dimensions – Height: 60mm; Width: 103mm; Thickness: 6mm.

Sport helmets

8. Fragment of Sport helmet? **PL. III.3F: 3**

Inv. No.: 7523 (IAA No.: 97-4287)

A copper-alloy fragment with three embossed registers. The largest of the three exhibits a recurring scale-like pattern, whose arched edges are divided by vertical lines. Two holes (for attachment?) are pierced in the fragment's body. A flat blank register divides the latter from a

[14] Robinson hinted to possibly correlation between the (Robinson 1975, 46).

[15] The registered are is Area P, may be a mistake, for such an area is unknown at Gamala.

third register with recurring relief of crescent pattern. It is difficult to offer a clear identification for this fragment. Nevertheless, the patterns described above are very akin to those displayed on sports helmets (Guisborough type), in particular the helmet from Theilenhofen (**PL. III.3F: 4**; Garbsch 1978, 55-56: F 1, Taf. 10). It should be noted that sports helmets are not unknown in siege sites, as a fragment of a cheekpiece of was uncovered at Masada (III.19/A.1).[16]

Dimensions – Height: 42mm; Width: 54mm; Weight: 5.5gr

Helmet fastening loops?

9. Helmet fastening loop (?) **PL. III.3F: 3**

Inv. No.: Area M; Square: 17-18; B. 2278/2

The copper-alloy ring is held by a rectangular plate. The plate is folded in two around the ring, with its halves secured by a rivet, which is now lost. Similar objects functioned as cheekpiece fastening devices, as demonstrated by numerous helmets (Imperial-Gallic and Imperial-Italic types, according to Robinson's typology). A pair of loops from Vindonissa (CH) was recently published under this category, while two more loops attached to fragmented cheekpieces come from that site (see below). However, such loops also occur on the inner side of the neck guards of helmets as well as above the neck guard and the forehead, as crest fasteners on Imperial-Gallic helmets (For early examples *cf.* Feugère 1994, 70-71; for early Roman occurrences *cf.* Robinson 1975, Figs. 28, 37; Pls. 118-119, 134-135, 194, 209, 217, 225, 230; Feugère 1994, 83, 86). In addition, similar loops were placed along the edges of greaves (Robinson 1975, Pls. VIII, 506-507, 523, 527; Garbsch 1978, Abb. 5 and Nos. Q5, Q15). Two such loops were found at Masada (Stiebel and Magness, forthcoming). The multiple uses of these objects, as detailed above – and these are only the ones of military nature – denotes that their identification as helmet fastening loops is not secure. It was found together with a silver-plated frog (below F.6).

Parallels – Unz and Deschler-Erb 1997, Nos. 584-585; for attached loops *cf.* Nos. 571-572.

Dimensions – Diameter of loop (external): 15mm; Thickness of loop: 1mm; Length of band: 23mm; Width of band: 8-9mm; Thickness of band: 1mm; Diameter of hole: 2mm

B. Armour

One of the advantages of the Roman soldier over his opponents was the superiority of his equipment. The legionaries were clad in segmental armour, numerous fittings and several fragments of which were uncovered at Gamala, most notably the remains of the *lorica* which

[16] See further section II – A.3.

belonged to L. Magus (Chapter 3 (ii) *a*). The latter are currently undergoing conservation process which attempts to mend the fragments.

Segmental armour ('*lorica segmentata*')

1. Armour fragments of '*lorica segmentata*' **PL. III.3G: 1-2; III.3H: 1; III.3I: 1-2 ; III.3J: 1-2; III.3K; III.3L; III.3M; III.3N: 1-3; III.3P: 3-4**

Inv. No.: Area T; L. 4019; B. 1937

See detailed discussion: Chapter 3 (ii) *a*.

2. Fragment of '*lorica segmentata*' **PL. III.3H: 2**

Inv. No.: Area T; L. 4033; B. 2030/2

Iron fragment of seemingly a small plate of the lesser shoulderguard. The curved plate has a lateral oblique edge and a raised perpendicular edge. Such features characterize Corbridge's Type C (Allason-Jones and Bishop 1988, Fig. 24). This locus yielded a tie hoop (B.22) and a *caliga* nail (D.2).

Dimensions – Width: 57-58mm; length: 98mm (*c.* 93mm – curved); Height: 2mm; Diameter of flat head: 7mm; length of rivet's shank: 10mm; Width of shank: 3mm

3. Fragment of '*lorica segmentata*' **PL. III.3P: 2**

Inv. No.: Area M; Square A: 15-16/A: 17-18; B. 2305-2

The remains of the iron plate consist of two very small fragments (33x20mm and 23x16mm) and a relatively large fragment (53x58mm). The body of the later, two perpendicular edges of which have survived, is slightly curved. In this square were also uncovered: tie hoop (B.25), shield binding (E.5), scabbard fittings (F.17, 20, 22).

Dimensions – length: 58mm+; width: 53mm+; thickness: 2mm.

4. Fragment of '*lorica segmentata*' **PL. III.3P: 1**

Inv. No.: Area T; L. 4027; B. 1840

Small fragment of a plate, with a straight edge and a leathering rivet with a flat circular head. Two more small fragments of irregular shape were found in this basket. This locus uncovered a fragment of a helmet edge-binding (A.5).

Dimensions – length: 48mm+; width: 21mm+; thickness: 1mm; diameter of rivet's head: 8mm.

5. Fragment of '*lorica segmentata*' ? (not illustrated)

Inv. No.: Area R North; L. 5161; B. 5903/1

Much corroded iron plate. The flat and thin plate does not have a defined edge. It may be a fragment of a '*lorica segmentata*' plate.

Dimensions – length: 40mm+; width: 34mm+; thickness: 1-3mm.

6. Fragment of '*lorica segmentata*' ? **PL. III.3N: 4**

Inv. No.: Area G; L. 1704; B. 6184a

Corroded fragment of a plate. The sloping edge suggests it may be identified as a fragment of an upper girth hoop.

Dimensions – Length: 46.5mm+; Width: 34mm+; Thickness: 1-2mm; Weight: 10gr.

Lobate hinges

7. Four lobate hinges **PL. III.3Q: 1-5; III.3R: 1-3**

The remains of L. Magus's armour retains two pairs of lobate hinges and three halved examples (see Chapter 3 (ii) *a*).

8. Lobate hinge **PL. III.3R: 4-5**

Inv. No.: Area T; L. 4189; B. 1200

Lobate hinge of a '*lorica segmentata*' cuirass. The copper-alloy object was found outside the wall of the city. It has very crude outlines that still follow the general lobate shape. The hinge is composed from three tubes, of which only part of the central has survived. The opposite edge exhibits the typical three lobes that are irregularly secured only by two rivets rather than three. On the back face of the object, the remains of the iron shoulder plates are still visible griped by the bent rivets. Compared with the more standardized forms of the lobate hinge (Robinson 1975, Fig. 182), the crude craftsmanship of the object from Gamala suggests it was seemingly a makeshift repair. A rather similar crudely made lobate hinge was unearthed at Rheingönheim (DE). A tie-hoop was uncovered in this locus (B.29).

Parallels – Rheingönheim (Ulbert 1969a, Taf. 33, 17).

Dimensions – 37x37mm; Thickness: 0.5mm; Diameter of rivets' heads: 7-8mm; Length of rivet's shank: 10mm; Width of the central tube: 7mm; Width of the sides tubes: 8mm.

Hinged buckles

9. Hinged buckle (not illustrated)

Inv. No.: Area M; Square A: 24-26; B. 1494

The hinged D-buckle was attached to a leather strap that was sheathed by the folded over plate, secured by one flat-headed rivet. The buckle is bent over, a common phenomenon attested for example at Masada and Jerusalem (III.10/B.1). The object was uncovered on the surface, outside the Wall, some 50m south of the synagogue.

Parallels – Thomas 2003, Type A.

Dimensions – Total length (bent): 29mm+; Length of plate (bent): 27+; Thickness of plate: 1.5mm; Diameter of rivet's head: 9-10mm; Length of rivet: 3.5mm; D-buckle: 16x18mm; Diameter of hinge's pin: 3mm; Length of tongue: 18mm; Thickness of buckle: 2-3mm.

10. Buckle hinge plate (not illustrated)

Inv. No.: Area S; L. 5003; B. 6176

A D-shaped copper-alloy loop of buckle.

Parallels – Thomas 2003, 56-57, Type Eii.

Dimensions – 25x22.5mm.

Hinged strap fittings

11. Hinged strap fitting **PL. III.3S: 4**

Inv. No.: Area T; Square E: 22; B. 1048

The hinged plate has two dome head rivets. Two concentric incised rings encircle the rivets. It appears that the thickness of the leather strap was 2mm. The fitment was either part of a strap hinged plate or that of buckle.

Parallels – Thomas 2003, Category A and B.

Dimensions – 13x20mm; Diameter of rivet heads: 5mm; Thickness of folded plate: 2mm; Length of rivets: 5mm; Thickness of strap: 1mm; Diameter of hinge (external): 3mm; Diameter of circular stamp: 8mm.

12. Hinged strap fitting **PL. III.3S: 5**

Inv. No.: Area T; L. 4021; B. 1876/1

The elongated plate of the strap fitting was folded over and strengthened by two flat-headed rivets. The hinge is damaged. The object was uncovered in the collapse of the building that is found behind the eastern wall of corridor 4019. A decorative washer was found in this locus (B.36), as well as a tie-hoop (B.14) and suspension loop (F.21).

Dimensions – 29x18mm; Thickness of plate: 1mm; Diameter of rivet heads: 6mm; Length of rivets: 3mm; Thickness of rivet: 3mm.

Tie-hoops

One of the largest groups of military fittings at Gamala is that of the tie-hoops. All in all, some 21 specimens were uncovered, 15 of which in Area T. Their exceptional occurrence in the excavations at Gamala is a well-documented phenomenon in sites of military nature

throughout the Empire the result of bimetallic corrosion[17] (Bishop 2002, 80; Bishop and Coulston 1993, 35 and note 8).

Type A

Simple loop, the body is pierced by two rivets and has a tapering or straight end.

13. Tie-hoop **PL. III.3T: 1**

Inv. No.: Area T; L. 4020; B. 1807/1

Copper-alloy tie-hoop, with tapering shoulders. The loop is open and the object was bent in the line of the first rivet, the hole of which is visible. This locus is the floor of the opening in the Wall, between the two towers at Area T. This basket contained also a scabbard ornament (F.9), a scabbard chape palmette-end decoration (below F.19) and a scabbard edging (below F.12).

Dimensions – 12mm x 25mm+; Diameter of loop (external): 11mm, width of loop: 3mm; Thickness of loop: 1mm; Thickness of plate: less than 0.5mm

14. Tie-hoop **PL. III.3T: 2**

Inv. No.: Area T; L. 4021; B. 1845/1

Copper-alloy tie-hoop with rounded shoulders. The loop is bent and the object was bent sidewise causing the break in front of the first rivet. The object was uncovered in the collapse of the building that is found behind the eastern wall of corridor 4019. In this room were further found: a decorative washer (B.36), a hinged strap fitting (B.12) and a suspension loop (F.21).

Dimensions – 11mm x 18mm+; Diameter of loop (external): 12mm, Width of loop: 3mm; Thickness of loop: 2mm; Thickness of plate: less than 0.5mm

15. Tie-hoop **PL. III.3T: 3**

Inv. No.: Area T; C: 14; B. 1081

Copper-alloy tie-hoop, with rounded shoulders. The loop is bent and the object was bent in the line of the first rivet, the hole of which is visible.

Dimensions – 15mm x 17mm+; Diameter of loop (external): 10mm, Thickness of loop: 2mm; Width of loop: 3mm; Thickness of plate: less than 0.5mm

16. Tie-hoop **PL. III.3T: 4**

Inv. No.: Area T; L. 4029; B. 1905/1

Copper-alloy tie-hoop, with rounded shoulders. The loop is bent and the object was bent in the line of the first rivet, the hole of which is visible. A grooved circle encircled the hole.

[17] Also known as galvanic or electrolytic corrosion.

Dimensions – 15mm x 21mm+; Diameter of loop (external): 11mm; Thickness of loop: 1mm; Width of loop: 3mm; Thickness of plate: less than 0.5mm

17. Tie-hoop **PL. III.3T: 5**

Inv. No.: Area M; L. 4151; B. 2491-1

Copper-alloy tie-hoop, with tapering shoulders. The object was bent in the line of the first rivet, the hole of which is visible. The hole is encircled by a concentric grooved circle.

Dimensions – 20x15mm+; Diameter of loop (external): 11mm, Thickness of loop: 2mm; Thickness of plate: less than 0.5mm

18. Tie-hoop **PL. III.3T: 6**

Inv. No.: Area T; L. 4018; B. 1819

Corroded tie-hoop. The plate is twisted and most of which is missing.

Dimensions – 9mm+ x 19mm+; Diameter of loop (external): 12mm, Thickness of loop: 3mm; Width of loop: 2mm; Thickness of plate: 1mm

19. Tie-hoop **PL. III.3T: 7**

Inv. No.: L. 1904; B. 6802

Complete copper-alloy tie-hoop with a slightly raised loop. No rivets has survived. The rivets holes are encircled by a concentric grooved circle.

Dimensions – 10mm x 35mm+; Diameter of loop (external): 10mm, Thickness of loop: 2mm; Width of loop: 2mm; Thickness of plate: 0.5-1mm; Diameter of holes: 2mm

20. Tie-hoop **PL. III.3T: 8**

Inv. No.: Area T; L. 4036; B. 2049 or 2072/1

Copper-alloy tie-hoop with rounded shoulders. The loop is slightly bent and the object broke in front of the first rivet. Additional tie-hoop was found in this locus (next item).

Dimensions – 9mm x 17mm+; Diameter of loop (external): 12mm; Thickness of loop: 2mm; Width of loop: 2mm; Thickness of plate: less than 0.5mm.

21. Tie-hoop **PL.III.3T: 9**

Inv. No.: Area T; L. 4036; B. 2049 or 2072/2

Copper-alloy tie-hoop with tapering shoulders. The loop is slightly bent and the object broke in front of the first rivet. Additional tie-hoop was found in this locus (previous item).

Dimensions – 8mm x 16mm+; Diameter of loop (external): 11mm; Thickness of loop: 1mm; Width of loop: 3mm; Thickness of plate: less than 0.5mm

Type B

Riveted loop, the body is pierced by two rivets and commonly has an expanding end. To the best of my knowledge no parallels are reported to the riveted loop tie-hoop.

22. Tie-hoop **PL. III.3T: 10**

Inv. No.: Area T; L. 4033; B. 2030/1

Broken tie-hoop that lost its loop. The elongated body widens, and is pierced by an attachment hole. The body is slightly concave in section. A fragment of segmental armour plate (B.2) and a *caliga* nail (D.2) were reported from this locus.

Dimensions – Length (damaged): 42.5mm+; Maximum width: 18mm; Diameter of hole: 2mm; Thickness: less than 0.5mm.

23. Tie-hoop **PL. III.3T: 11**

Inv. No.: Area T; L. 4181; B. 1096/1

Tie-hoop with a riveted loop, the rivet of which is now lost. The loop is uniquely square, and a grove runs along the centre of its outer face (compare with next item). The loop is slightly twisted to the side, while the body lacks its wider end, which presumably retained an additional fastening hole now lost. The object was found outside the Wall, in front of the two towers.

Dimensions – Length: 46mm+; Square loop (external): 15x12mm, Thickness of loop: 1mm; Thickness of plate: less than 0.5mm

24. Tie-hoop **PL. III.3T: 12**

Inv. No.: Area G; L. 1506; B. 6614/3

Copper-alloy tie-hoop. Merely its loop, of square outlines, has preserved (compare). According to the broken edges of both body and loop, the later was secured to the body with a rivet.

Dimensions – 11 x 9mm (damaged); Width of loop: 3mm; Thickness of loop: 1mm.

25. Tie-hoop **PL. III.3U: 6**

Inv. No.: Area M; Square A: 17-18; B. 2346/1

Riveted loop, the rivet of which is missing. The loop is bent aside. The other expending end is partly damaged. It still retains a dome head rivet. Fragment of '*lorica segmentata*' (A.3), shield binding (E.5), scabbard fittings (F.17, 20, 22) were also found in this area.

Dimensions – Length: 44mm; Width: 11mm+; Diameter of loop (external): 12mm; Thickness of loop: 2mm; Thickness of plate: less than 0.5mm; Diameter of rivet: 4mm

26. Tie-hoop **PL. III.3T: 13**

Inv. No.: Area T; L. 4028; B. 1886/1

Riveted loop. The loop is bent aside. The other end is partly damaged and slightly expands. Both flat-head rivets have survived. The body of the plate is twisted. Additional two very large tie-hoops were found in this locus (see below Nos. 14-15). It was uncovered in a room, north of the northern tower, to which corridor 4019 is opened.

Dimensions – Length: 43mm– (twisted); Width: 10mm; Diameter of loop (external): 4mm, Thickness of loop: 2mm; Thickness of plate (max.): 1mm; Diameter of rivets' heads: 7 and 10mm.

27. Tie-hoop **PL. III.3T: 14-15**

Inv. No.: Area T; L. 4028; B. 1954/1

A very large riveted loop tie-hoop: 72mm long! The loop is bent aside, the rivet of which is missing. The other end retains a dome head rivet. Additional large tie-hoop was found in this locus (next item) and riveted loop tie-hoop (previous item). It was uncovered in a room, north of the northern tower, to which corridor 4019 is opened.

Dimensions – Length: 72mm; Width of plate: 13mm; Diameter of loop (external): 14mm, Thickness of loop: 2mm; Thickness of plate: 1mm; Diameter of dome-head rivet: 3mm.

28. Tie-hoop **PL. III.3T: 16**

Inv. No.: Area T; L. 4028; B. 1954/2

A fragment of a riveted loop tie-hoop. The fully stretched loop of a large tie-hoop (see previous item). The plate is missing. This locus yielded two more tie-hoops (Nos. 13-14). It was uncovered in a room, north of the northern tower, to which corridor 4019 is opened.

Dimensions – Length: 68mm (stretched loop); Thickness of loop: 2mm; Diameter of hole of rivet: 3mm.

29. Tie-hoop **PL. III.3U: 1**

Inv. No.: Area T; L. 4189; B. 1182

A fragmentary tie-hoop was found outside the wall. Only the loop and small part of the body have survived. The loop is partly bent aside. This locus also yielded a lobate hinge (B.8).

Dimensions – Length: 19mm+; Width of plate: 12mm; Diameter of loop (external): 18mm; Thickness of loop: 3mm; Thickness of plate: 0.5mm

30. Tie-hoop **PL. III.3U: 2**

Inv. No.: 1074 (Gamala 1975)

A fragmentary tie-hoop. The loop and small part of the body alone have survived. The loop is partly bent aside.

Dimensions – Length: 19mm+; Width of plate: 10mm+; Diameter of loop (external): 12mm; Thickness of loop: 2mm; Thickness of plate: lees than 0.5mm

31. Tie-hoop **PL. III.3U: 3**

Inv. No.: Area T; L. 4032; B. 2059/1

Copper-alloy tie-hoop, of which only the circular loop (of rectangular section) and small part of the plate have survived. Its distorted position indicates the tie-hoop was torn from the lorica's plate.

Dimensions – 11mm x 18mm+; Diameter of loop (external): 11mm, Thickness of loop: 1mm; Thickness of plate: less than 0.5mm.

32. Tie-hoop **PL. III.3U: 5**

Inv. No.: Area T; Square B: 4-5-6; B. 1411/1

Broken tie-hoop that lost its loop. The elongated body widens, and is pierced by a flat head rivet. The same locus retained a belt mount (G.1).

Dimensions – Length: 35mm; Width: 14mm; Thickness plate: less than 0.5 mm; Diameter of rivet: 70mm.

33. Tie-hoop **PL. III.3U: 4**

Inv. No.: Area T; L. 4185; B. 1115

Broken tie-hoop that lost its loop. The elongated body widens, and is pierced by an attachment hole.

Dimensions – Length: 32mm+; Width: 17mm; Diameter of hole: 2mm; Thickness of plate: less than 0.5mm

Type C

Simple loop, the body is pierced by one rivet with an expending end.

34. Tie-hoop **PL. III.3U: 7**

Inv. No.: Area T; L. 4031; B. 2041/1

A simple tapering copper-alloy strap. The thin end curls to form the loop. The body has a single flat rivet. The crude nature of the body and rivet-head may indicate a local innovation. Fragments of U-guttering edge-binding were uncovered in the is locus (A.3-4).

Parallel – Vechten (NL) (Kalee 1989, 217, No. 20, Fig. 20).

Dimensions – Length: 39mm; Width of plate: 11mm; Thickness of plate: less than 0.5mm; Width of loop: 3mm; Thickness of loop: 1mm; Diameter of rivet head: 7-9mm; Thickness of head: 1mm

Decorated washers

During the early Principate, floral washers decorated helmets as well as articulated armour. At Gamala, one washer is still attached to the plate aside a lobate hinge (**PL. III.3Q: 3-4**).

35. Decorated washer **PL. III.3U: 8**

Inv. No.: Area T; Square: C: 18; B. 1164 (IAA No.: 97-4270)

A copper-alloy washer embossed in a rosette design. The embossed petals are spaced around the central attachment hole, and vertical lines divide the space between the petals. The petals are encircled with three circles: the outer two – of dots (1.5mm each) and the inner circle is composed of vertical embossed lines (2mm long). The structure of the object is very flimsy and part of its perimeter is missing. Such washers decorated the breast and shoulder plates of the '*lorica segmentata*', and constitute a very common find in the *militaria* assemblages unearthed throughout the Empire.

Parallels: Vindonissa (Unz and Deschler-Erb 1997, Taf. 31: 637-657, mainly 641 – with bibliography); Longthorpe (Dannell and Wild 1987, 89: 22, Fig. 21 – with bibliography)

Dimensions – Diameter (estimated): 42mm; Diameter of central hole: 3mm; thickness: 0.5mm (and less); Weight: 0.9gr+

36. Decorated washer (not illustrated)

Inv. No.: Area T; L. 4021; B.1831/2-3

A decoration rosette boss with a central attachment hole, in two matching parts. The design of external and inner circles with raised radial lines was embossed on a copper-alloy sheet. Its circular outlines were cut in a rough manner. Part of its perimeter is damaged. The object was uncovered in the collapse of the building that is found behind the eastern wall of corridor 4019. A hinged strap fitting (B.12), a tie-hoop (B.14) and a suspension loop (F.21) were found in this locus.

Parallels – see previous item.

Dimensions – Diameter: 23mm; Diameter of hole: 4mm; thickness: 0.5mm (and less).

37. Decorated washer **PL. III.3U: 10**

Inv. No.: Area T; Square B-9; B. 1339/1

Embossed copper-alloy (brass?) washer. The ornamental boss has a cable-like perimeter and floral pattern. Only half of the object has survived.

Parallels – see above B.35.

Dimensions – Diameter of the washer: 33mm; Width of flange: 2mm; Height of washer: 5mm; Thickness: less than 0.5mm; Diameter of central hole: 5mm.

Leathering roves

39. Leathering washer/rove **PL. III.3U: 11**

Inv. No.: Area M; Square A:21, 22; B. 1660-1

A square copper-alloy plate with a single fastening hole. Leathering rove of segmental armour.

Parallels – Thomas 2003, 118-119, type Ki.

Dimensions – 16x17mm; Thickness: 1mm; Diameter of hole: 2mm.

Scale armour (*lorica squamata*)

Copper-alloy scales

40. Copper-alloy scale **PL. III.3V: 5**

Inv. No.: Area T (C-19); B. 1082

Single copper-alloy (brass?) scale. Long with embossed rim and mid-rib, 4 small attachment holes in the upper centre. The scale belongs to Type 1 (Chapter 3 (ii) *b*). The scale was tinned and not silver-plated as claimed by Gutman (Gutman 1994, 74, bottom). It was found near the surface outside the Wall, opposite a massive part of the Southern Wall.

Parallels – Masada (III.19/B).

Dimensions – Length: 28mm; Width: 13mm; Thickness: 1mm; Diameter of holes: 1.5-2mm.

41. A pair of copper-alloy scales **PL. III.3V: 4**

Inv. No.: Area S; L. 5022; B. 7552

A fastened pair of copper-alloy scales (Type 7). The large scales exhibit four attachment holes in the upper centre part of the scale and two pairs of lateral fastening holes. A mid-rib runs along their longitude axis. The scales are attached by a thin copper-alloy wire. They were unearthed in an undefined area above the oil press complex. Several water installations were found in this area.

Parallels – Masada (III.19/B).

Dimensions – Length: 32mm; Width: 16mm; Diameter of holes: 1mm.

Iron scales

Unlike in the Roman West, iron scales are not a very common find in Israel. To date iron scales were reported from Herodian Jericho (Herodian): I.4/B.1-2. A single scale was found at First Revolt context at Masada, while a complete iron scales cuirass was recently unearthed at Sepphoris (III.6/B.1). Ferrous scales were reported from the hoard of weapons that was allegedly found in a cave near Hebron (V.31/B.2-3) and Tel 'Azeqa (V.11/B.1), both dated to the Second Revolt. The large scale may have originated in a *cataphracti* suit of armour.

41. Iron scale **PL. III.3V: 1**

Inv. No.: Area T; L. 4002; B. 1045, 1054

The corroded iron scale has lost its right upper corner. Its lower end was cut into a sharp point, whose tip is slightly off axis. Two fastening holes are visible along its upper end. A pair of holes is spaced in the middle of the left edge, the corrosion seems to hinder the parallel pair on its right edge. The upper part of the body is flat, while its lower half is slightly convexed. This phenomenon is also attested at Tel 'Azeqa (V.11/B.1) and in the West (Robinson 1975, 154, Pls. 436, 439, 441). This feature seemingly had functional advantages, for it strengthens the structure of the scale and assisted in deflecting incoming missiles (Chapter 3 (ii) *b*).

Parallels – von Groller 1901, Taf. XV, No. 22. Iron scales from Palestine are reported from Jericho (Herodian): I.4/B.1-2; Tel 'Azeqa (V.11/B.1), Sepphoris (III.6/B.1) and Hebron (V.31/B.2-3).

Dimensions – Length: 33mm; Width: 23mm; Thickness: 1mm; Diameter of hole: 2mm.

42. Iron scale **PL. III.3V: 2**

Inv. No.: Area G (?); Sq. 8; 9; 10; 11; L. 1223

Large iron scale. The corroded object is convexed, along its centre's width. Its upper end is chipped but was originally straight. A vertical pair of fastening holes is pierced at its left upper end. Additional vertical pair was seemingly was pierced at its right upper end, of which only the lower hole has persevered. A possible additional hole was located between these two pairs. A single hole is visible at the right lower end. The lower end was cut to angular point. A 10mm slice damaged the tip of the lower point. The size of the scale may indicate it was part of a *cataphracti* scale-armour (Chapter 3 (ii) *b*).

Dimensions – Length (upper end is damaged): 51mm+; Width: 35mm; Thickness: 1mm; Diameter of holes: 3-4mm; height of curve: 5mm.

43. Iron scale? **PL. III.3V: 3**

Inv. No.: Area S; L. 2025; B. 3832

The flat iron scale-like object has trapezoidal outlines, with a curved lower edge. Three holes were spaced at its upper end and still retain their short rivets. No exact parallels are known and the existence of fastening rivets rather than wires makes it difficult to identify it as a scale. However, irregularly shaped scales are reported, some of which bears resemblance to the outlines of the object under discussion; for example the scales from Volubilis and Thamusida (MA) (Boube-Piccot 1994, 54, Nos. 23-25, Pl. 2).

Dimensions – Length (chipped): 39mm+; Width of lower end: 36mm; Width of upper end: 19mm; Thickness: 1mm; Diameter of rivets: 3-4mm; Length of central rivet: 6mm.

C. Limb defences

1. Thigh guard (cuisse) **Figs. 8: 2, 9: 1-2, 10: 1**

Inv. No.: Area B; L. 1296; B. 3134

For a detailed discussion see: Chapter 3 (iii) *a*.

Armguard (*manica*)

2. Shoulder-guard of a *manica*? **Figs. 11 : 1-2**

Inv. No.: Unknown

For a detailed discussion see: Chapter 3 (iii) *a*. The object was found in one of the boxes that contained parts of the panoply of L. Magus; hence, it may have originally been part of this assemblage.

Dimensions – Length: 80mm; Width: 132mm; Height of curved cross-section: 15mm; Diameter of holes: 3mm; Diameter of rivet heads (imprint): 11-12mm; Thickness of rivet shanks: 2mm; Length of preserved shanks: 6mm; Weight: 44.69gr.

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail **PL. III.3W: 1**

Inv. No.: Area R north; L. 5101; B. 4044/1

Dome-head *caliga* nail, with a square cross-sectioned bent shank. The head is damaged due to corrosion. It was found near the living level of the room, together with an iron scabbard chape (F.11), and pommel fitting (F.3).

Parallels – Siege camps, Masada (III.20/D; Gutman 1964, 115), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2); Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-3), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

Dimensions – Diameter of head: 11mm; Height of head: 6mm; Length of shank (bent): 12mm; Thickness of shank: 3mm.

2. *Caliga* hobnail **PL. III.3W: 2**

Inv. No.: Area T; L. 4033; B. 2030/3

Caliga nail with a pointed dome head.

Parallels – see previous item.

Dimensions – Diameter of head: 11mm; Height of head: 6mm; Height: 9mm+; Thickness of shank: 3mm; Thickness of head: 1mm.

3. *Caliga* hobnail **PL. III.3W: 4**

Inv. No.: Area S; L. 1921; B. 8230.

Caliga nail with a dome head. Broken stem

Parallels – see previous item.

4. *Caliga* hobnail **PL. III.3W: 3**

Inv. No.: Area R north; L. 5153; B. 5300

Dome-head *caliga* nail, with square-sectioned bent shank.

E. Shields

In his description of the first Roman attack on Gamala, Josephus notes the employment of the *testudo* manoeuvre that saved the life of Vespasian (*BJ* 4.33-34; see Chapter 3 (iv) *f*). The assemblage from Gamala comprises most of the non-organic components of the Roman shield: bosses, iron handgrips or reinforcing strips, copper-alloy binding and a rare group of ownership tags.

Bosses (*umbones*)

Two identical circular bosses were found at Gamala. This type is traditionally associated with the auxiliary shield (Bishop and Coulston 1993, 82). The remarkable resemblance of the decorated bosses appears to suggest a joint origin of production, seemingly indicating the owners served in the same unit.

1. Circular boss **PL. III.3W: 5**

Inv. No.: Area R-S, surface 7794 (IAA No. 97-4338)

A circular copper-alloy boss was found on the surface in the southern sector of the city, which is situated below the peak of the city (the 'citadel'). Some 50% of the item is missing. An embossed nipple decorates its centre. Two blows, of edged weapon (?), damaged the centre section. A running motif of two interlacing lines of embossed dots decorates the flange's perimeter, while a second line of larger embossed dots decorates the middle part of the flange. Two attachment holes, out of four, with iron corrosion have survived. An identical boss was found east of the city (see next item). Chapter 3 (iv) *b*.

Dimensions – Diameter of boss: *c*. 135mm; Diameter of bowl: 70mm; Diameter of central nipple decoration: 11mm; Diameter of large dots: 5-6mm; Diameter of small dots: 1-2mm; Weight: 29.4gr+.

2. Circular boss (not illustrated)

Site: 21-25/96/2 (eastern cemetery) – G-28/1997; Locus 1146.

A near complete circular boss was discovered in 1997, during a survey in a cemetery east to Gamala, by the IAA survey unit of the central and South Golan (Map ref.: 2199 2566).[18] The boss bears striking resemblance to the additional boss that was found within the city (see previous item). Small part of its perimeter is now missing. A shallow bowl, decorated with an oval nipple-like element, rises in the boss's centre. The perimeter of the boss features an embossed dots decoration. An interlacing motif of two lines of small dots adorns its edge, while additional line of larger dots decorates its centre. The attachment of the boss to the shield board was by means four iron nails, evenly spaced along its perimeter. This method is attested by the four holes, which still retain clear iron corrosion products. Attachment to the shield board was commonly by four rivets, as is authentically manifested on a pedestal relief from '*praetorium*' at Mainz (DE) (Selzer 1988, 244, No. 271). The boss has suffered a blow from a thin and long object, possibly an edged weapon that left its mark on the boss's face.

Dimensions – Diameter: 141-142mm; Diameter of bowl: 70mm; Diameter of central oval decoration: 13x16mm; Weight: 59.72gr+.

Shield reinforcing strips/grips

3. Shield reinforcing strip/grip **PL. III.3X: 3**

Inv. No.: Area T; L. 4019

The remains that are associated with the panoply of L. Magus retain an iron strip, both its ends exhibit flat circular terminals. Such objects were used to reinforce the board (see Chapter 3 (iv) *c*). Compare with next item.

Parallels – Masada (III.19/E.11); Bethther (V.6/E.1). Western examples: Hod Hill (UK) (Manning 1985, 147, T9-10); Bar Hill (Robertson, Scott and Keppie 1975, 100, Fig. 33, 19); Strasbourg (FR) (Forrer 1927, Taf. LXXIX: E); Bonner Berg (DE) (van Driel-Murray and Gechter 1983, 59, Taf. 16: 28), Rheingönheim (DE) (Ulbert 1969a, 52, Taf. 47, 1-4), Hofheim (DE) (Ritterling 1913, 144, Taf. XVIII, 1-17); Carnuntum (AT): von Groller 1901, 106; Taf. IX: 30-32.

Dimensions – Length: 300mm (bent); 360mm (stretched); 12mm.

4. Shield reinforcing strip/grip **PL. III.3X: 1-2**

Inv. No.: Area T; Square C: 17; B. 1029

[18] The IAA survey unit of the central and south Golan include Moshe Hartal, Yigal Ben-Ephraim, Ran Barnur and Aharon Elrom. I thank Yigal Ben-Ephraim of the IAA for granting me the permission to publish the artefact and for the information regarding the site and the find circumstances.

Two corroded fragments of an iron strip. Both terminate in a bent round element, which is pierced in its centre. Though surely parts of the same bar, the two fragments do not match due to the corrosion.

Parallels – See previous item.

Dimensions – Length of first fragment (curved): 170mm; Width of first fragment: 12mm; Thickness of first fragment: 2.5-3mm; width of terminal of first fragment: 16mm; Length of second fragment (curved): 155mm; Width of second fragment: 12-14mm; Thickness of second fragment: 2-3mm; width of terminal of first fragment: 17mm.

5. Shield binding **PL. III.3Y: 1**

Inv. No.: Area M; Square A: 17-18; B. 2346/2

Small fragment of copper-alloy U-binding. One hole for attachment is visible on the body, rather than through a lobate – typical of the West.

Fragment of '*lorica segmentata*' (A.3), tie-hoop (B.25) and scabbard fittings (F.17, 20, 22).

Dimensions – Length: 59mm+; width: 17mm; Diameter of hole: 2mm; Thickness: less than 0.5mm.

5. Six fragments of shield binding (not illustrated)

Inv. No.: Area T; L. 4019; B. 1937-B

Six small fragments of copper-alloy U-binding were associated with the panoply of L. Magus. Together were found also four copper-alloy flat-headed attachment rivets, one of which still fastened to the binding.

Dimensions –

1. 60+x23mm (unfolded?) – with a hole.
2. 60+x16mm
3. 36+x14mm
4. 39x12mm+ – with a rivet
5. 45+x14mm – with two holes.
6. 23x17mm+ – with a hole.

Ownership tags

The inscriptions upon all three tags from Gamala were punched in dots – *punctim* technique.[19] For a detailed description and historical background of this group of fittings, see: Chapter 3 (iv) *e*.

6. Ownership tag **PL. III.3Y: 2**

[19] I am indebted to Prof. Roger Tomlin for the initial reading of the three *tabulae*.

Inv. No.: Area T, Locus 4019; B. 1937

The *tabula ansata* tag forms part of the panoply of a Roman soldier that was found in locus 4019, which in addition to helmet fittings, fragments of a '*lorica segmentata*' suit, a *gladius*'s scabbard chape and the handle of a *pugio*, included also a reinforcement bar of a shield. The three lines inscription was punched in dots.

Diplomatic Transcript:

> MVSI
L MAGI
> GALLI

Translation:

of the century of Mus(us) / Musi
(property) of L(ucius) Mag(us)
of the century of Gall(us)

The duplication of the *centuria* is of interest. Judging from the lines' layout and spacing on the note, it seems that the original inscription retained only the second and third lines, and that the somewhat squeezed legend, > MVSI, was added in a latter date. The association of multiply units with one soldier is not common in ownership inscriptions. However, a Flavian inscription on a circular boss from Zwammerdam (*Nigerum Pullum*) (NL) mentions both: T VERACIS PVPI and T MANSVETI PVPI (Haalebos and Bogaers 1970), suggesting the soldier Papus either served in two *turmae* or under two different commanders. Similarly it seems just assuming that L. Magus either changed *centuriae* or that his commanders have shifted.

Lucius Magus[20] was a citizen soldier. If we are to trust Josephus's account about the deployment of the forces on the battlefield, he did not serve in *legio XV Appolinarius* as the latter was positioned in the sector 'over against the point where stood the highest tower in the town' (*BJ* 4.13), whereas the tag was found in area T, in the very other side of the Wall. Thus, he was either serving in *legio V Macedonica*, that fought against the 'centre of the city' (*ibid.*), or in *legio X Fretensis* that was 'employed in filling up the trenches and ravines' (*ibid.*). It is commonly accepted that two legions were involved in the actual fighting and the *legio X Fretensis* was engaged in the trench-works. Therefore, this soldier must be affiliated to *legio V Macedonica*. However, this interpretation of the topographical deployment of the legions against the city walls, from top to bottom, neglects one sector – the lower part of the wall, near the ravine of southern Dalyot river. If *legio XV Appolinarius* was engaged with a very limited sector of the round tower, it is not conceivable that *legio V Macedonica* was

[20] lit. the wise man, magician.

fighting against the entire length of the wall, especially in light of Josephus's explicit words that it was fighting: 'opposite the centre of the city' (*κατα μέσην εξειργάζετο την πόλιν*) (*BJ* 4.13). Now, if we return to the Greek text that applies to the tasks of the 10th legion, besides the filling up of the trenches (*τας δε διώρυγας ἀνεπλήρου*) Josephus further writes: *και τας φάραγγας*. Could this narration applying in addition to the defensive *fossa* along the wall (*BJ* 4.6; Syon 2002, 137, 139), also to the lower sector of the city that reached the ravine of southern Nahal Dalyot? If so, one may assign *legio X Fretensis* with a more active role in the battle. Josephus refers to a Syrian *centurion* and his ten Syrian soldiers that were trapped within the boundaries of the city following the first assault (*BJ* 4.37-38), a fact that accords well the origin of the soldiers of the 10th *Fretensis*. The assignment of Lucius Magus to a legion is therefore not certain and the Syrian legion is not a less favourite option.

The officers' names deserve dwelling upon. The first to be noted is the *century* of MVSI. The standard reading would be: Musus, a very rare *cognomen*. I could not find it in the military nomenclature. A single reference is made to a Greek sculptor: '...whoever this Musus may have been...' (Paus. 5.24.1). We are familiar with the famous lineage of Publius Decius Mus, that according to legend sacrificed their life (4th-3rd century BC). The abbreviated version of Mus[... is documented in several military inscriptions (for example: Soulahti 1955, 375, No. 157).[21] This *cognomen* may have stood for Musius, a celebrated example is Gnaeus Musius, an *aquilifer* of the *legio XIV Gemina*, Mainz (DE). Since, the *cognomen* Musus is yet unattested, an alternative reading was sought out. It appears that 'Musi' may be interpreted as a man who came from Musia or Moesia, similarly to 'Suri' that represents a man of a Syrian origin (*LD*).[22] Thus, this *centurion* may have had a Moesian origin, which granted him his name.[23]

In addition, as noted in the third line, L. Magus served under the command of a *centurion* name Gallus (lit. Gallic), a well-attested *cognomen*. In a remarkable coincidence the only *centurion* name to be noted by Josephus in his account of the battle at Gamala, was that of Gallus (*Γάλλος*) (*BJ* 4.37-38). Although very tempting, it seems far fetch suggesting to identify the *centurion* noted in the ownership inscription with the very Gallus mentioned by

[21] Also see the tombstone of:
MVS.VET.
LEG.XV.APOL
AN.XI.H.S.E
VETIN.SABIN
See: Bahat D. and Sabar Sh., *Jerusalem – Stone and Spirit: 3000 Years of History and Art*, New York, 1998, photo on p. 79.

[22] The nickname *Musi* – the mouse, is not likely (for blasphemy slogans, such as the 'bald', see: Keppie 1984, 125).

[23] For a prosopographical study of the *Legio X Fretensis*'s officers (Dąbrowa 1993).

Josephus, as Gallus was a rather popular *cognomen*. Nevertheless, be that as it may, it is a vivid relic from the fight witnessed by Josephus during his first steps alongside the Flavians.
Dimensions – 60x30mm; Diameter of attachment holes: 20mm; Height of letters: 7-8mm.

7. Ownership tag **PL. III.3Y: 3-4**

Inv. No.: Area T; Square R, S: 7, 8; Basket 1351.
The tag was uncovered near the surface, outside the wall. It was unearthed near the two towers in Area T and close to corridor 4019.

Diplomatic Transcript:

C VETQ[
C · LICI[

Translation:

of the century of Veto(nius)
(property) of C(aius) Lici(nius) / Lici(nianus)

The point that follows the letter C in the prefix of the second line, suggests the reading of the praenomen Gaius, whereas the letter C in the first line appears to mark the *centuria*, following the formula of naming both the soldier and the unit. For the cognomen Licinius see: Kajanto 1965, 204).
Dimensions – Height: 18.5mm; Width: 25mm+; Diameter of attachment hole: 2.5mm; Height of letters: 5.5-6.5mm; Weight: 0.9gr

8. Ownership tag **PL. III.3Z: 1**

IAA No.: 97-4245

Diplomatic Transcript:

> PIO

Translation:

the century of Pius

The *cognomen* Pio appears as a variation of Pius (lit. pious, dutiful, affectionate, holy).
Dimensions – Length: 18.5mm; Width: 25mm+; Diameter of hole: 2.5mm; Height of letters: 5.5-6.5mm; Weight: 0.9gr.

F. Edged arms

Swords

In the narration of the chaos that prevailed in the city as a result of the collapse of the houses' roofs, during the first Roman attack, Josephus writes that:

> 'Seeing in this the interposition of divine providence, the men of Gamala pressed their attack regardless of their own casualties; they forced the enemy, stumbling in the steep alleys, up on the roofs and with a continual fire from above slew any who fell. The debris supplied them with boulders in abundance and the enemy's dead with blades; for they wrested the swords from the fallen and used them to dispatch any still struggling in death' (*BJ* 4.26-27).

Interestingly, despite the fact that numerous scabbards' fittings were uncovered not a single blade of an edged weapon was found, but one handle of a *pugio*.

1. Votive model of a sword **PL. III.3AR: 1**

Inv. No.: Area B; L. 1292; B. 2323

A unique votive model of a sword was unearthed in Area B. Though its pommel and handle have slightly effected from the corrosion, the iron sword is in a neat state of preservation. A ridged pommel surmounts the handle which is decorated by consecutively oblique grooves – *cf.* handgrip form Dangstetten (DE) (Bishop and Coulston 1993, Fig. 37: 2b). The handle is defined by a pair of horizontal grooves and terminates by a reeded handguard. The blade features an oar-like shape.

A possible example of a curved model sword was found at Binayanei Ha'uma (V.15/F.1). In the Roman period votive weapons are not unknown.

Dimensions – Length: 101.5mm; Length of blade: 59.5mm; Width of blade: 14mm; Thickness of blade: 3mm; Length of pommel: 9mm; Diameter of pommel: 11mm; Handgrip: 8x6.5mm; Height of handguard: 6mm; Length of handguard: 28mm; Thickness of handgrip: 6mm.

Hilt fittings

2. *Pugio* handle **PL. III.3AA: 1-2**

Inv. No.: Area T; L. 4019; 1937b

The panoply of L. Magus retained a typical iron handle of the military *pugio*. The composite handle had an inverted 'T' shape with a central swelling and additional one at the top, which formed a pommel. Two iron faces fastened by copper-alloy rivets sheathed a wooden core (Bishop and Coulston 1993, Fig. 40.1; Obmann 1993). Only one iron face was found at Gamala. It had a pair of lateral attachments holes in the handguard, while two more holes are located in the pommel's centre and a large rivet in the central swelling. Copper-alloy rivets

were used, the central rivet and the left rivet of the pommel, have survived and are still discernable in the X-ray image (**PL. III.3AA: 3**).

Parallels – Obmann 2000, Nos. 1-23; Taf. 30-32; Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 191-205, Taf. 11 – p. 18 with bibliography).

Dimensions – Length: 93mm; Width of handguard: 46mm; Width of middle swelling: 21mm; width of handle: 12-13mm; Thickness: 2mm; Diameter of central rivet's head: 5-6mm; Length of pommel: 23; Width of pommel: 26mm; Diameter of holes of pommel: 2mm; Diameter of holes of handguard: 2mm.

3. Pommel fitting **III.3AF: 3-5**

Inv. No.: Area R North; L. 5101; B. 4347

A metal fitting ('Nietknopf') of a *gladius* grip, which was fixed to the pommel, at the end of the tang. The beveled perimeter of the mushroom-like head is chipped. Its base broadens from the 'leg' of the object, forming a U-guttering feature that allowed its mounting to the pommel. The copper-alloy object is heavy in weight. Its central hole is seemingly lined with lead (?), forming a square hole. Iron rust products, presumably of the tang, are visible on the white substance. The parallel from Augusta Raurica (CH) is reported to be made of 'buntmetall'. In this locus an iron scabbard (F.11) and a *caliga* nail (D.1) were found.

Parallels – Augusta Raurica (Deschler-Erb 1999, 25: No. 94, Taf. 8); Rheingönheim (DE) (Ulbert 1969, 44-45, Taf. 32: 1, 4; 56: 1).

Dimensions – Height: 17mm; Diameter: 30mm; Diameter of hole: 13mm; Hole for tang: 8x8mm.

Scabbards

A rich assemblage of scabbards' fittings was unearthed at Gamala. Both copper-alloy and iron U-guttering scabbards are documented. Tinning is amply used, as well as one instance of silver-plating one again illustrating the Roman military fondness of gleamy appearance. The iconography of the equipment draws from the common pool of military designs. Hence, two eagle motifs decorate *gladii* scabbard mounts, manifesting a clear legionary linkage. It is interesting that fittings from both the Mainz and Pompeian types occur concurrently at Gamala. I do not think that this should necessarily undermine the commonly accepted chronological typology but simply exemplifying the lastingness of military equipment in service.

5. Scabbard chape **PL. III.3AA: 4**

Inv. No.: Area T; L. 4019; B. 1764

The panoply remains of L. Magus included the scabbard chape of his *gladius*. The fragmentary object is constructed of a copper-alloy U-guttering edging with the typical knobbed terminal. The silver plated terminal is crown by three ridges and a nipple-like tip occupies the centre of its knobbed end.

Parallels – Gamala (next item), Masada (III.19/F.20) – with references. In the West: Verulamium (UK) (Webster 1958, 90, No. 199, Fig. 7 – with references); Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 126-127, 136-140 and 172-173, Taf. 8-9 – see p. 17 for references).

Dimensions – Length (damaged): 42mm+; Width (damaged): 2mm+; width of U-guttering: 9-10mm; Thickness of U-guttering: 0.5mm; Diameter of silvered tip: 13mm; height of silvered tip: 13mm; Diameter of nipple: 5mm.

6. Scabbard chape **PL. III.3AD: 2**

Inv. No.: Area T; L. 4015; B. 1332

Copper-alloy knobbed terminal. Three joined ridges decorate its face. The nipple element at the base of the terminal is pierced. The context of discovery is the Western room in the buildings complex, west of the two towers in the living level.

Parallels – see previous item.

Dimensions – Height: 10.5mm; Diameter: 12mm.

7. Scabbard mount with eagle decoration **PL. III.3AB: 1**

Inv. No.: Area T; L. 4188; B. 1150

Copper-alloy scabbard mount. The point of the triangular plate is broken, as the well as its left upper quarter. An attachment hole is pierced in the upper centre of the plate. The perimeter of the entire plate exhibits different patina. This feature, 2-4mm in width, clearly echoes the frame of the scabbard in which the mount was set. An incised image of an eagle occupies the centre of the plate. The eagle is depicted standing with both its wings spread, its head turns right. The claws are clearly visible and the tail is described pointing down to the right. Although the overall execution is not of high artistic level, still all the different types of feathers are meticulously and naturalistically depicted. The space around the eagle is filled by punched dots. The eagle appears to stand upon a small hill, which explains the different level of the depicted claws. The lower triangular part of the mount is decorated by lines of rhomboids that are alternately decorated by dots and circles. These patterns resemble the ornamentation a scabbard mount from Gamala (below F.10). The inferior craftsmanship is reflected in the upper line of the rhomboid, as the two right elements appear to be more like triangles. The artefact was uncovered outside the Wall, near architectural remains that pre-dated the Wall. It was found very close to corridor 4019.

Dimensions – 72x54mm+.

8. Eagle ornament of scabbard mount **PL. III.3AB: 2**

Inv. No.: Area T; L. 4034; B. 2007-2

Copper-alloy fragment of a *gladius*'s scabbard mount. The thin mount that ornamented the scabbard of a *gladius* exhibits a description of an eagle. The openwork technique links the object to the Mainz-type. The eagle is looking to the left while its curved beak touches the spread wing. Using a crescent-headed awl the craftsman meticulously produced all parts of the eagle's wing, as well as its neck feathers. The eye is presented by an oval punched contour. In addition, punched circles consecutively decorate the surrounding metal straps. Additional mount alike was found at Gamala (see next item). The object was uncovered outside the Wall, east of the Towers in the collapse layers of the Wall. A circular harness fitting was found in this locus (Q.14).

Dimensions – 25x35mm+.

9. Scabbard ornament **PL. III.3AE: 3**

Inv. No.: Area T; L. 4020; B. 1807/2

The thin copper-alloy fragment formed part of a *gladius* scabbard. It is decorated with tendril and ivy leaf motifs in openwork technique and set in a thin frame. Such ornamentations are typical to the Mainz type. The kind of openwork is attested upon both the locket, central mount and the scabbard chape. A copper-alloy scabbard chape of Mainz type was uncovered at Masada, and this style was replicated in leather on a unique *vagina* from Masada (III.19/F.18). This locus is the floor of the opening in the Wall, between the two towers at Area T. The object was uncovered with a scabbard chape palmette-end decoration (F.20), a scabbard edging (F.12) and a tie-hoop (B.13).

Parallels – Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 45-47, 48, 50, 53-54, 57, Taf. 4-5 – see p. 17 for references).

Dimensions – 34x14mm; Thickness: less than 0.5mm; Width of frame: 3-5mm.

10. Scabbard mount with triangles ornament **PL. III.3AB: 3; AC: 1**

IAA No.: 90-3013

Complete copper-alloy scabbard chape. The U-guttering frame has a typical bulbous terminal. A transverse mid-ribbed strap, fixed by two pairs of rivets, strengthens the frame. A copper-alloy triangular plate is set in the frame. An attachment hole for the organic components of the scabbard is located in the upper part, slightly off centre. Most of the plate's front is occupied by an elaborate punched decorative design, but the side and upper margins. The front plate is divided into six tapering columns, the two central columns are short. The lateral columns were decorated by a consecutive pattern of 10 triangles, filled by punched dots, separated from each other by a circle topping a line. The main field, of four columns, is occupied by squares that are divided into four triangles. The upper and lower triangles are

filled by punched dots. Examination of the plate indicated that it was first decorated and thereafter cut to shape the frame. This is evident in light of the uneven lateral margins and the fact that the ornamentation was cut away in the lower part.

The artefact was stated to be gilded (Gutman 1984, 98 and photo on page 97; Syon 2001, 145). An examination of the object by 14 kt gold testing solution (#GT 44 of JPS) clearly negated this determination.[24] The red and yellow colours are the result of an aggressive chemical cleaning. The back of the plate indicated that in fact it was originally tinned.

Dimensions – Length: 110mm; Width: 80mm; Diameter of bulbous tip: 10mm; Reeded strap: 67x12mm; Diameter of rivets' head: 1.5mm; U-guttering frame: 6mm; Width of plates' margins: 7mm (left), 9mm (right) and 5-6 (upper); Width of plate: 5.75mm; Length of plate: 91mm; Diameter of hole in plate: 2mm; Weight of frame: 19.1gr; Weight of plate: 3.8gr.

11. Iron U-guttering sheath **PL. III.3AD: 1**

Inv. No.: Area R north; L. 5101; B. 4044/2

The rare iron sheath consists of a U-binding that tapers to an oval knobbed terminal. Scant organic remains are visible on the inner face of the guttering (note arrow). Its narrow dimensions appear to allow the introduction of a dagger's blade rather than that of a sword. Few iron dagger sheaths are documented in the Roman west (see parallels below), while one example alone has been reported to date from the east: an iron sheathed dagger from Tell Schech Hamad (SY). The rarity seems to relate to the extended sensitivity of ferrous artefact to corrosion at Gamala, in comparison with copper-alloy objects. A pommel fitting (F.3) and a *caliga* nail (D.1) was found in this locus – near the living level of the room.

Parallels – Masada (III.19/F.1); Jericho (Stiebel 2004a); Exeter (UK) (Obmann 2000, Taf. 27); Dangstetten (DE) (*ibid.*, Taf. 28); Tarent (Italy) (*ibid.*, Taf. 29).

Dimensions – Length: 57mm+; Diameter of terminal: 9x12mm; Thickness of guttering: 1mm; Width of guttering: 6mm; Width of opening of guttering: 9mm.+.

12. Scabbard edging **PL. III.3AD: 4**

Inv. No.: Area T; L. 4020; B.1807/4

Fragment of scabbard edging. The U-guttering is slightly deformed and broke on both ends. Similar artefacts are reported from the Roman West. This locus is the floor of the opening in the Wall, between the two towers at Area T. It was discovered with a palmette-end decoration (F.19), a scabbard decoration (F.9) and a tie-hoop (B.13).

Parallels – Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 165-174, in particular 170-173).

Dimensions – Length: 46mm+; Width: 4mm; Depth: 4-6mm; Thickness: less than 0.5mm.

[24] It contains Nitric and Muriatic acid.

13. Scabbard edging **PL. III.3AD: 5**

Inv. No.: Area S; L. 1907; B. 7329

Copper-alloy U-guttering edging. Too thin to be identified as a shield edging and too straight to be a helmet's edge-binding the artefact appears to be fragmented scabbard binding. It is noted to be uncovered in level IV.

Parallels – See previous item.

Dimensions – Length: 69mm+; Width: 5x6mm; Thickness: 0.5mm.

14. Scabbard edging **PL. III.3AD: 3**

Inv. No.: Area T; L. 4027; B. 1902 and 1903-2

Copper-alloy U-guttering edging. This locus yielded fragments of segmental amour plates (B.4).

Parallels – See previous item.

Dimensions – Over all length: 167mm+; Width: 4x4mm; Thickness: 0.5mm.

15. Scabbard mount **PL. III.3AE: 2**

Inv. No.: Area T; B 9-11; B. 1226-1

Scabbard suspension mount with reeded decoration on its upper face. A pair ridges occupies the median of the copper-alloy band. Two attachment holes are spaced at both the object's ends. The distorted condition of the mount suggests that it was torn from the sword's scabbard. The points from which the suspension loops stems are defined by folding lines, which allow us to determine the original width of the scabbard: 80mm. This basket contained also a tinned scabbard plate (below – F.17).

Parallels: Israel: several examples were found at Masada (Stiebel and Magness, forthcoming). West: Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 80-81, 83, 86-95, 99-106, 107-110, Taf. 6-7 – with references on p. 17).

Dimensions – Length: 163mm+; Height: 11mm; Thickness: 1mm; Diameter of holes: 2mm

16. Scabbard mount **PL. III.3AE: 1**

Inv. No.: Area S; L. 1920; B. 8056

The complete copper-alloy mount is misshapen presumably as it was dismantled from the scabbard. Two pairs of ridges ornament the front face of the object. The dimensions of this part (60mm) indicate the width of the sword's scabbard. The rear part of the mount is flat and flanked by two pairs of holes. The same arrangement of holes is found on a mount from Vindonissa (Unz and Deschler-Erb 1997, No. 96, Taf. 7). The item was found in a steep alley.

Parallels – See previous item.

Dimensions – Length: 160mm; Length of reeded part: 60mm; Width: 9-10mm; Thickness: 0.5-2mm; Diameter of holes: 2mm.

17. Scabbard plate? (not illustrated)

Inv. No.: Area T; B 9-11; B. 1226-2

Triangular plates were set in edged arms' scabbards. The thin fragmented copper-alloy plate slightly tapers and lacks both its upper and lower edges. The front face of the object was tinned. It is worth noting that the basket contained a sword's scabbard mount (above F.14).

Parallels – Vindonissa (Unz and Deschler–Erb 1997, Nos. 123-124, Taf. 7 – with references).

Dimensions – Length: 83mm; Width: 33-31mm; Thickness: less than 0.5mm.

18. Scabbard chape palmette-end **PL. III.3AF: 2**

Inv. No.: Area M; Square A: 17-18; B. 2216

The finger nail-like feature is the upper end of a Pompeian–type gladius scabbard chape. Faint parallel incisions decorate the object. The upper face of the fragment is silver-plated or tinned. The object was found outside the city wall.

Parallels – Complete examples: Masada (III.19/F.19); Pompeii (IT) (Ulbert 1969b); Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 5, No. 62); Mainz (DE) (Schoppa 1974, Abb. 1a-b, Taf. 26: 1).

Dimensions – Width: 14mm; Height (damaged): 23mm; Thickness: ~0.5mm; Depth: 4mm.

19. Scabbard chape palmette-end **PL. III.3AF: 1**

Inv. No.: Area T; L. 4026; B. 1859, 1877

The copper-alloy fitting is a palmette-end of a *gladius*'s scabbard chape. Seven lines were incised on its upper surface, where traces of silver, or more likely tin, are still visible. See below: F.20-21. Complete example: Augusta Raurica (CH) (Deschler-Erb 1999, No. 136).

Parallels: Masada (III.19/F.21); Oberstimm (DE) (Schönberger 1978, Taf. 21:B 130), Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 149-164).

Dimensions – Width: 14mm; Height (damaged): 19mm+; Thickness: 1mm; Depth: 4mm.

20. Scabbard chape palmette-end **PL. III.3AE: 5**

Inv. No.: Area T; L.4020, B. 1807/3

The palmette-end of a *gladius* scabbard chape. Five incised lines radiate from the centre to form the palmette. This locus is the floor of the opening in the Wall, between the two towers at Area T. It was found along with a tie-hoop (B.13), scabbard decoration (F.9) and U-guttering binding (F.12).

Parallels – see previous item.

Dimensions – Length: 20mm+; Width: 17mm; Thickness: 0.5mm.

21. Scabbard chape palmette-end **PL. III.3AE: 4**

Inv. No.: Area M; Square A: 17-18; B. 2346/3

Two typically scrolled ends of the lower part of the palmette decoration. The same basket, that was found outside the wall, retained a possibly fragment of the palmette or the vegetable ornament of an openwork scabbard.

Parallels – Vindonissa (CH) (Unz and Deschler-Erb 1997, 7, Nos. 150, 152-154, 156-161, 163-164, Taf. 9 – with bibliography); Augusta Raurica (CH) (Deschler-Erb 1999, Taf. 8, No. 121).

Dimensions – Length of 1st fragment: 21mm+; Width: 3mm; Length of 2nd fragment: 15mm+; Width: 3mm; 3rd fragment: 22x16mm.

22. Dagger scabbard suspension loop **PL. III.3AG: 1**

Inv. No.: Area T; L. 4021; B. 1823 (IAA 97-4248)

The tinned copper-alloy object is a part of a *pugio* suspension loop. The bar has a rhomboid section, which flattens at both ends. Its ends were shaped as scrolls and originally accepted two studs. The two scroll elements were soldered to each other to ensure the loop's strength. Soldering remains are visible near both the external scroll peaks, the points where it was attached to the embracing flat band that linked the loop to the scabbard. Similar suspension loops of silver constituted part of a richly decorated set that was found at Velsen (NL) (Morel and Bosman 1989, 182-183, Figs. 8, 9B) and Mainz (DE) (*MZ* 30, 1935, 68, Taf. 6,3; Obmann 2000, 24: D 21, Taf. 11-13).

The object was uncovered in the collapse of the building that is found behind the eastern wall of corridor 4019. A decorative washer (B.36), a hinged strap fitting (B.12) and a tie-hoop (B.14) were found in this locus.

Parallels – Masada (III.19/F.26-27); 'Ein Gedi (V.22/F.1-2); Herodium (Stiebel 2003a, No. 3a). Ample parallels are reported throughout the empire: UK (Grew and Griffiths 1991, 50, Nos. 157-162, Fig. 15), Vindonissa (CH) (Unz and Deschler–Erb 1997, 18-19: 209); North of France (?) (Feugère 1993, 163, upper right).

Dimensions – 25 x 17mm; Thickness: 2.5-3 mm; Weight: 2.1gr.

23. Dagger scabbard suspension loop **PL. III.3AG: 2**

Inv. No.: Area M; Square A: 17-18; B. 2345

Identical to the previous item. It was originally tinned, most of which is at present lost due to chemical cleaning of the object.

Parallels – see previous item

Dimensions – 23x16mm; Thickness: 2-3mm.

24. Scabbard suspension loop **PL. III.3AG: 3**

Inv. No.: Area T; Square B: 9; B. 1338

Copper-alloy loop with a rhomboid-like section. It is set in a much corroded band of an organic material – seemingly leather. Interestingly, a bone frog was found in the same square (F.9). Together was further found a seemingly tooled leather fragment of the scabbard's body that exhibits an impressed reeded pattern of the scabbard mount (22x24mm). For such loops: F.25-26.

Dimensions – diameter of loop (external): 15mm; thickness of loop: 2mm; width of band (damaged): 15mm+; length of band: 12mm; thickness of band (corroded): 2-4mm; leather fragment: 22x26mm; thickness of leather fragment: 1.5mm.

25. Scabbard loop? **PL. III.3AG: 4**

Inv. No.: Area T; L. 4006; B. 1194/3

Copper-alloy ring, possibly a scabbard's fastening loop. Compare with previous item and see next item.

Dimensions – Diameter: 14mm; Thickness: 1-2mm

26. Scabbard loop? **PL. III.3AG: 5**

Inv. No.: Area T; L. 4020; B. 1807/5

Copper-alloy ring, possibly a scabbard's fastening loop. Compare with previous item.

Dimensions – Diameter: 16-20mm; Thickness: 1-2mm.

G. Belts

1. Hinged belt mount

Inv. No.: Area T; Square B: 4-5-6; B. 1411/2

Near square hinged mount. One edge of the copper-alloy band was folded over and riveted by two rivets and the hinge was thereafter cut. A rather similar technique was used in the making of the lobate hinges of the '*lorica segmentata*'. Four rivets spaced in its corners attached the mount to the seemingly leather strap. The mount was found along with a fragment of a '*lorica segmentata*' tie-hoop (B.32).

Parallels – Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 1075).

Dimensions – 27x30 (34mm, with hinge); Thickness of plate: 1mm; Hinge (internal diameter): 2mm; Diameter of rivets' heads: 5mm.

2. Belt mount

Inv. No.: Area T; L. 4001; B. 1049

The rectangular copper-alloy plate was possibly used as a belt mount. It has two fastening holes in the corners of one edge (one hole was punched twice) and three along the other.
Dimensions – Length: 50mm; Width (twisted): 30mm; Width (unfolded): 38mm; Diameter of holes: 2mm

3. Belt mount

Inv. No.: Area T; L. 4186; B. 1140

The rectangular copper-alloy plate, possibly a belt mount, is damaged. Two fastening holes are located on one of the lateral edges. The longitudinal edges are very slightly bent backwards.

Dimensions – Length: 56mm+; Width 28mm; Diameter of holes: 2mm

4. Decorating stud of belt mount

Inv. No.: Area T; L. 4019; B. 1762

The cast copper-alloy cap has eight equidistantly spaced cuts, which grant it with the shape of a rosette. A circular hole was pierced in the centre of the object. Though smaller in dimension it bears resemblance to metal caps unearthed in Pfünz (DE) (*ORL* B No. 73, 38 No. 50 Taf. 13: 39 and 41; Oldenstein 1976, Nos. 25, 27, Taf. 11) and Weissenburg (DE) (Oldenstein 1976, No. 28) that are associated with griping assemblage of edged arms. James suggested such caps covered pommels, like the rock crystal sword pommel from Dura-Europos, Syria (James 1990, 2.3.8, Pls. 2.3.G and H). Strong affinity to the object from Gamala is indeed discernible in the pommel from Dura-Europos.[25] However, the object appears to be a central rosette decoration feature of a belt-plate with pseudo-hinges, as attested on the seemingly Augustan belt-plate found in the River Lujbljanica at Bevke (SL) (Istenič 2003, 286-190, Figs. 4-5). See also Augusta Raurica (CH) (Deschler-Erb 1999, 45: No. 367, Fig. 44, Taf. 20).[26] Embossed belt plates, with an integral floral boss element, that imitate this style are known elsewhere: Rheingönheim (DE) (Ulbert 1969, 40, Taf. 27: 7), Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 901, Taf. 36).[27] The fact it was discovered in Area T, Locus 4019, may associate it with the *balteus* of L. Magus, from the panoply of which the scabbard chape and the handle of the *pugio* have survived. An identical object was further found at Gamala (see next item).

[25] Such rosettes appear on the reconstruction of the chamfron from Newstead (UK) (UK) (Robinson 1975, 190ff, Pls. 514-516; Garbsch 1978, S 6, Taf. 46: 1). The lower hem and the ivy-like designs of the object's centre are represented decorated by rather similar looking studs.

[26] It is most likely that not a few of the belt plates of this type had such a central decorative element (Unz and Deschler-Erb 1997, 884-892, 894-913 – other type of rivet: *ibid.*, no. 893).

[27] This pattern occurs also on the inlaid dagger sheaths – Colchester (UK) (Obmann 2000, Taf. 5: GB 25), Leeuwen (NL) (*ibid.*, NL 2), Nijmegen (NL) (*ibid.*, NL 1) Utrecht (NL) (*ibid.*, Taf. 7: NL 8), Mainz (DE) (*ibid.*, Taf. 7: D 10; Taf. 9: D 12-13), Köln (DE) (*ibid.*, Taf. 8, D 8).

Dimensions – Height: 7mm; Diameter: 18mm; Diameter of hole: 2.5mm; Thickness: ~0.5mm.

5. Decorating stud of belt mount

Inv. No.: Area T; Square C-18; B. 1073

A central decorative cast copper-alloy rosette fitting with the eights open work pellets. It still retains its fastening sphere headed rivet, the tip of which is broken.

Parallels – see previous item.

Dimensions – Maximum height: 12mm; Height of cap: Diameter of cap: 16.5-17mm; Thickness of cap: 1mm; Length of rivet: 12mm; Diameter of rivet's head: 5mm; Thickness of rivet: 2.5mm.

6. Belt decoration? **PL. III.3AG: 6**

Inv. No.: Square: A 6; B. 5004

Copper-alloy dome-shaped object, which was uncovered 65cm from the city's Wall. An incised inscription is discernable upon the cap. Its back exhibits soldering material. The two letters' inscription appears to read:

Diplomatic Transcript:

< Ī

Translation:

C(ohors) Ī

It was seemingly attached to a belt as a decorative element, although the exact function of the object is not clear.

Frogs

7. Frog

Inv. No.: Area G; L. 1507; B. 6933

Silver-plated or tinned copper-alloy frog. The head is elaborately decorated with a running tendrils motif, executed in punched dots (*punctim*). The perimeter of the head is raised. A central boss, consisting of three concentric circles, rises from its centre and the shank protrudes from the head at right angle with a loop at its end. See Vol. I, pp. 127-129. The object was uncovered on the surface, outside the Wall, some 50m south of the synagogue.

Parallels – Künzl 1977, Abb. 14. Frogs with looped shank were reported from Qumran (III.17/G.3), Masada (III.19/G.13), and siege Camp F, Masada (III.20b/G.1). See next item.

Dimensions – Length: 29mm; Height: 9mm; Diameter of head: 22mm; Thickness of head's centre: 3.5mm; Thickness of head: 1mm; Height of shank: 6mm; Width of shank's body: 8mm; Thickness of shank (at loop): 2mm; Diameter of shank's loop (external): 14mm.

8. Frog

Inv. No.: Area M; Square 17-18; B. 2278/1

The copper-alloy frog features a simple circular flat head, the upper face of which is silver-plated. A distorted shank protrudes from its back, off centre, on the end of which a loop is set. The object falls under Wild's type VIIIa (Wild 1970, 143, 153-154: Nos. 117-127). The silver-plating of the head – indicates once again the Roman soldiers fondness of shiny look. It was found together with a possibly helmet fastening loop (A.9).

Parallels – See previous item. Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 2064-2087, and in particular 2082-2085; references: *ibid.*, 54)

Dimensions – diameter of head: 22mm; thickness of head: ~0.5mm; total height (distorted): 19mm; Thickness of shank: 1mm; diameter of hole: 7mm.

9. Bone frog

Inv. No.: Area T; Square B:9; B. 1337

Only the shank of the bone frog has survived. The typical trapezoid element has a semi-circle hole in its centre, intended for a leather strap. A straight line was incised across its width, just above the hole (such lines are noticed, for example, on items from Vindonissa – see below). The faint remains of circular incisions on its top are the only mark of the lost circular head. The rear face of the shank is slightly chipped at its bottom.

Bone frogs were included in Wild's typology under the category of loops and fasteners (Wild 1970, Type X). Yet, the close affinity with the metal frogs suggests that they had similar function. The employment of bone elements in association with scabbard fastening is not surprising, as bone buckles of the Roman *balteus* were recorded in military sites (Grew and Griffiths 1991, Nos. 129, 131, 152, 156; Béal 1983, 255, 381, Pl. 44: 1341; Unz and Deschler-Erb 1997, Nos. 1192-1193, 1194-1209, Taf. 44 – bibliography on p. 37[28]). In Palestine: Caesarea (IV.1/G.1-2); Wolfe Family collection (VI.9/G.1).

Parallels – Banasa (MA) (Boube-Piccot 1994, 91, No. 132, Pl. 13); Vindonissa (CH) (Unz and Deschler-Erb 1997, 55, Nos. 2107-2129, Taf. 71-72 – with bibliography)

Dimensions – Surviving length: 18mm+; Width of shank: 19.5mm; Thickness of shank: 3mm; Loop: 8.5x6mm.+

10. Frog

[28] See further: Nos. 2012-2035, Taf. 70 – bibliography on p. 54.

Inv. No.: Area B; L. 1282; B. 460.

This copper-alloy frog consists of a short triangular shank with a simple bar head. The object accords Wild's type IX (Wild 1970, 143). It is not a very common type of frog, possibly due the fact that it did not provide a very secure gripping.

Parallels – Wild 1970, 154, Nos. 131-135; Volubilis and Banasa (MA) (Boube-Piccot 1994, 92, Nos. 133-135, pl. 13); Vindonissa (CH) (Unz and Deschler–Erb 1997, 55, Nos. 2103-2105, Taf. 71 – with bibliography); Aislingen (DE) (Ulbert 1959, 95: No. 27, Taf. 24).

Dimensions – Length: 22mm; Maximum width: 15mm; Height: 4mm; Width of head: 12mm; Head: 3x2mm; Thickness of shank: 1.5-2mm; Length of shank: 21mm; Inner width of shank: 9mm.

H. Shafted weapons

Only few remnants of shafted arms were unearthed at Gamala, of which merely two features Roman affinities and none appears to originate in the front fighting zones. The rareness of shafted heads in besieged cities is reported elsewhere in the east, for example from Dura-Europos and Masada (Dura-Europos – James 1990, 79; Masada – Stiebel and Magness, forthcoming). It therefore seems to represent a defined phenomenon that needs dwelling upon.

We may approach this subject from either archaeological or tactical perspectives. Though it may be argued that the small number of heads should be accounted for the restricted scope of excavations in the inner parts of Gamala, one cannot deny their apparent absent in the clash line at the walls that was rather thoroughly excavated. The uncovering of numerous metal arrowheads and *catapult* bolts there, clearly denotes that the ill representation is not due to preservation conditions or may not be accounted for a meticulous Roman gathering of metal heads.

Pilae

Several examples for one of the most characteristic weapons of the legionaries were uncovered at Gamala. The relatively small number of fittings should not surprise us as it was less effective in the siege battle, whether it was against an enemy that took shelter behind the walls, or with in the boundaries of the city if one takes into account its harsh topography.

1. *Pilum* collet **PL. III.3AK: 2**

Inv. No.: Area R North; L. 5108; B. 5133

The heavily corroded object is a collet that sheathed the junction of the iron shank and the wooden shaft. The conical shaped fitting has a square section.

Parallels – General plates *cf.* Bishop and Coulston 1993, Figs. 33: 1-3, 34, 10-13; Feugère 1993, 166-167: 1-3, 5-13; Carnuntum (AT) (von Groller 1901, Taf. XXIII: Fig. 1); Vindonissa (CH) (Unz and Deschler–Erb 1997, 19-20, Nos. 220, 234-246 – with ample bibliography for Europe).

Dimensions – Height (damage): 37mm; Lower section (much damaged): 22x~19mm; Upper section: 18x18mm; Thickness (corroded): 3-5mm.

2. *Pilum* collet? **PL. III.3AK: 3**

Inv. No.: Area S; L. 1909; B. 6914, 6916, 6932, 7099

The corroded iron conical shape object has a square section. If not the proximal end of the socketed *catapult* bolt, the object appears to be a *pilum* collet.

Parallels – See previous item.

Dimensions – Height: 28mm; Lower section: 15x13mm; Upper section: 10x13mm; Thickness (corroded): 4mm.

Spearheads

3. Iron spearhead **PL. III.3AK: 1**

Inv. No.: Area B; L. 1258; B. 999 (IAA no.: 90-3144)

A large leaf shaped spearhead. The tang is socketed, with possible wooden remains of the shaft. The head is mid-ribbed. It was uncovered on the floor of a room, with rich findings from Area B, which dated to the second half of the 1st century BC (Gutman 1994, 71). See next item.

Dimensions – Length: 292mm; Length of head: 175mm; Width of head: 41mm; Diameter of socket: 17mm; Weight: 314.20gr.

4. Iron spearhead (not illustrated)

IAA no.: 90-3144; B. 1545

Iron leaf shaped socketed spearhead. The socket has a long slit and a fastening nail.

Dimensions – Length: 216mm; Length of head: 130mm; Width of head: 33mm; Thickness of head: 3-6mm; Width of socket: 14-19mm; Length of tang: 86mm; Length of slit: 72mm; Diameter: 18mm; Diameter of nail: 2mm; Weight: 104gr.

I. Archery

The battle account depicts the topographical difficulties the Roman archers faced in the final attack over the 'citadel' and the crosswind (wind-planing) from which the Jewish archers suffered (*BJ* 4.75-76). For the types and spatial distribution analysis see: Stiebel 2003a, 217; *apud* 2005b, 100 (**PL. III.3AL: 1**). The arrowheads will be published by Jody Magness.

M. Torsion artillery

The Romans employed artillery machinery in the battle (*BJ* 4.27). Ample evidences where uncovered outside and inside the Wall and inside the boundaries of the city. For the types and spatial distribution analysis see: Stiebel 2003a, 217; *apud* 2005b, 99-100 (**PL. III.3AL: 3-4**). The *catapult* bolts will be published by Jody Magness, while the ballista balls by Andrew Holley.

N. Rolling stones and projectiles

Josephus explicitly notes the defenders' use of boulders (*BJ* 4.27). Archaeological finds related to this category were uncovered in the excavations outside the Wall; see: Stiebel 2003a, 219; *apud* 2005b, 101.

O. Siege equipment

1. *Falx muralis* **PL. III.3AM**

Inv. No.: Area G; L. 1501; B. 7001

The composite shafted weapon consist of a socketed leaf shaped spear from the base of which stems a sickle like feature. For a detailed description, see: Vol. I, p. 180.

In light of this find one may distinctly determine that in spite of the fact that Josephus has acquired military knowledge from reading, his descriptions were very much in touch with reality.

Dimensions – Total length: 325mm; Total width: 170mm; Length of point: 147mm; Width of point: 36mm; Maximum thickness of point: 7mm; Length of sickle: 135mm; Width of sickle: 36mm; length of socket: 178mm; Diameter of socket: 28-55mm.

K. Sling

Josephus narrates the approaching of King Agrippa to the Wall writing that he: 'was struck on the right elbow with a stone by one of the slingers' (*BJ* 4.14). Further indication maybe found in the narration of Vespesian's near escape during the failing first Roman attack (*ibid.*, 4.33-34). His guard shielded their commander by forming a *testudo* that diverted the multitude of the defenders' missiles, part of which may have been slingshots. The excavators did uncovered small pebbles (Gutmann 1985, 42 and *apud* 1994, 95), however as such pebbles form part of the Neogen local rocks, one may not establish which of the pebbles was in human hands (Syon and Yavor 2001, 31). One leaden slingshots was uncovered at Gamala in Area B – second half of the 1st century BC.

Slingshots

1. Leaden slingshot **PL. III.3AL: 2**

Inv. No.: Area B; Square A: 20; B. 1194

Biconical pellet with an oval cross-section. Found on the surface of Area B, which dates to the second half of 1st century BC.

Parallels – Jerusalem (III.12/K.1-2). An inscribed leaden shot (Stiebel 1997).

Dimensions – 25x16.5x14mm

Q. Riding equipment

The assemblage from Gamala comprises of bits, spurs, halter and harness decorations (pendants and *phalerae*). The relatively small group of equine equipment should not surprise us. The very nature of the siege in addition to the harsh topographical conditions of the city dictated the mounted force a far less crucial place in the combat and consequently less it was prone to leave its mark in the archaeological record. The excavations indicated that the inhabitants of Gamala possessed horses, at least in the second half of the 1st century BC, as two horse's skeletons were unearthed in Gamala, one of which along with part of its bridle gear.

1. Halter (not illustrated)

Inv. No.: Area B; L. 1281; B. 2034 (IAA No.: 90-3014)

A copper-alloy ring, 123mm in diameter, was found in close association with the equine skeletons at Gamala. The ring was aside the jaw of the mature horse of the two (Gutmann 1994, 117). It was seemingly used for leading the mount as a sort or part of a halter. Mounts were lead with a chain – *šeir* (Shab 5.1; PT Shab 7_{a-b}, 8_b; T Shab 4.4; Shab 51_b, 52_a; 61_b; 64_a). The Semitic word occurs in Aramaic: (שירא *šeira*) – chain, and in Syriac: (شير *šir*), which designates a rope, leash, strap. Rashi interpreted it as a kind of clasp around its neck with a ring set in it, and a rein with which to lead the horse is inserted in it.

Dimensions – Diameter: 123mm; diameter of tube: 9mm; thickness of external tube: 1mm; diameter of the inner tube: 7mm; diameter of rivet: 2.5-3mm; weight: 192.7 gr

Bits

Snaffle-Bit

2. Two-link snaffle bit **PL. III.3AP: 3**

Inv. No.: Unknown provenance (No. 56)

The short biconical iron rod with loops on each end is a link of an iron two-link snaffle bit. The snaffle bit has two sub-types: plain bit and two-links snaffle bit. The latter bit is constructed of joint links, each of which is a short rod that terminates in two loops. One loop

was designed to attach the links, while the other held a free-moving ring. The loops of one link are set on one plain, while that of the other link are angled in 90°.

Providing control over the horse, the snaffle bit is considered the least severe bit (Manning 1985, 66; Dixon and Southern 1992, 63; On the operation of the snaffle bit *cf.* Hyland 1993, 56ff.). The two iron links were held in its mouth, while the bridle straps and reins are attached through the side-rings. The loops of the iron link from Gamala are set on the same plane, both broken. The fact that they differ in size is not without significance. Like with the three parallels from Germany, detailed below, the small loop of the iron rod was used for the attachment of the links and the larger held the side-ring.

The snaffle bit is designed to control the mount using two hands. The two-link snaffle bit had a Celtic origin and was very popular in Iron Age Europe. It appears to be the most common type in the Roman west (Manning 1985, 66). The link from Gamala is to date the sole example of the type in the Roman East.

Parallels – Tiefenbach and Gräfenhausen (DE) (Junkelmann 1992, 18, Abb. 6), Castell Neuwied-Neiderbieber (DE) (*ibid.*, 24, Abb. 14). For UK examples – Hod Hill and London? – *cf.* Manning 1985, 66-67, H10-17, Pls. 28-29, with ample bibliography.

Dimensions – maximum length: 79mm; length of rod: 42mm; thickness of rod: 6x9mm – 11x12mm; diameter of side loop (external): 22mm; thickness of side loop: 5-6mm; diameter of inner-loop (external): 16mm; thickness of inner-loop: 5-6mm.

Spurs

A pair of iron spurs and an additional example are reported from Gamala. The pair was unearthed in Area B, in a 1st century BC context, while the other, found near the town's wall, seemingly dates from the First Revolt period.

In the East Mediterranean, spurs appear to be introduced during the Hellenistic period, initially noted by Xenophon as a jumping aid gadget (*Art of Horsemanship*, 8.5). In the west it was associated with the Celts (Azzaroli 1985, 115). Turning to the Roman period, several works were dedicated to the classification of Roman spurs (Jahn 1921; Shortt 1959; Manning 1985, 69-70; Dixon and Southern 1992, 58-59). Both copper-alloy and iron were used in the production of spurs, but the material selection appears to have little significance to their typology. Three principal types of spurs are recognized, following the method in which the leather straps were attached to the spur: hooks, loops and rivets. Additional used criterion is the shape of prick or arm that rises from the spur's body.

All three spurs from Gamala were produced from iron, and feature very close resemblance to each other. A simple pointed prick rises from the centre of the U-shaped body. The ends of the body's arms are flattened and retain a 5mm hole. The spurs lack any sign for the existence of a rivet, though theoretically such a feature may have been presented and now lost. It is

more likely that the pierced non-angled ends represent a hybrid form of the riveted and the looped types, like the spur from Vindonissa (CH) (Unz and Deschler-Erb 1997, 51, No. 1963, Taf. 69). Classified under the category of 'Ösensporn' ('ear' – i.e. loop spur), this spur differs from the loop category, like the spurs of Gamala, in that its loops or pierced end are aligned with the spur's body and not angled to it. Due to the small sample, the exact manner of attachment remains uncertain. In Palestine, a copper-alloy spur is reported from Samaria (I.6/Q.3) and a possible iron example from Herodium (Stiebel 2003a, 236-237, No. 148, Fig. 21).

3-4. A pair of loop spurs **PL. III.3AQ: 1**

Inv. No.: Area B; L. 1270; B. 1817a/b; IAA. No.: 90-3264 and 97-4299

A pair of iron spurs was uncovered in Area B. They were found in the room next the one in which the two horses' skeletons were unearthed (Gutman 1994, 117). They belong to the loop type (Stiebel 2003a, 236-237). At the top of the heel rises a short prick in the form of a simple point. Two attachment holes were punched through the flattened ends of the arms. One example is complete, while the second is missing one of its ends and part of its prick.

Dimensions – L. 1270; B. 1817b (IAA. No.: 97-4299) Height (including prick): 61mm; Width: 72mm; Length of prick: 10mm; Diameter of prick at base: 5mm; Diameter of holes: 5mm; Thickness: 2mm; Weight: 20.3gr.

Dimensions – L. 1270; B. 1817a (IAA. No.: 90-3264) Height (damaged): 55mm+; Width (damaged): 68mm+; Thickness: 2mm; Weight: 17.7gr.

5. Iron spur **PL. III.3AQ: 2**

Inv. No.: Unknown

A single iron spur was recently found in a section of an unexcavated part of a service room adjacent to the synagogue.[29] The corroded spur is missing the straight parts of both its arms. The curved arc has rectangular section, which expands towards the peak. The prick is a simple conical point.

The context of the find suggests it dates from the time of the First Revolt. If indeed so, the close affinity between the pair of spurs from Area B and the spur under discussion hints that little did the structure of the spur changed during the Second Temple period.

Dimensions – Height (damaged): 50mm+; Width of spur (damaged): 66mm+; Width of arms: 13-17mm; Thickness of arms: 5-6mm; Height of prick: 16mm.

Harness pendants

[29] I thank Yoav Farchi for bringing the find to my attention.

One the commonest designs of Roman harness pendants is the lunate. In the symbolic world of the Roman harness fittings, lunate pendants appear to represent the luna, and together with the round *phalera*, symbolised the eternal couple – the moon and the sun, femininity and masculinity. This popular design may also have been intended to protect the horse from evil forces (Bishop 1988, 108).

6. Lunate pendant **PL. III.3AN: 1**

Inv. No.: 90-3195

Complete copper-alloy lunate harness pendant. It has acorn terminals and a loop hanger.

Parallels – Bishop's type 9.

Dimensions – Length: 56mm; Width: 45mm; length of loop: 10+13.5mm; Width of loop: 7.5mm; Thickness of body: 1-2mm; Thickness of terminals: 3mm; Weight: 16.4gr.

7. Lunate pendant **PL. III.3AN: 3**

Inv. No.: Area S; L. 1924; B. 7852 (Strata I)

A copper-alloy pendant of crescent shape. The arms of the pendant have knobbed teardrop-like terminals. Mere remains of the suspension neck are visible upon the centre of the object's perimeter. The hole intended for a minute inter-pendant is spaced in the body's centre. The object was discovered in the lower end of a steep alley, in the very southern end of the city.

Parallels – Bishop 1988; 153, type 9e; Vindonissa (CH) (Unz and Deschler-Erb 1997, 1316 – p. 43 with bibliography).

Dimensions – Width: 26.5mm; Length: 29mm; Thickness: 1mm; Terminals: 4 x 3mm; Diameter of hole: 2.5mm; Width of loop: 3mm.

8. Lunate pendant **PL. III.3AN: 2**

Inv. No.: (IAA No. 97-4312)

No available data, but the photo.

9. Pendant **PL. III.3AO: 1**

Inv. No.: Area S; L. 5051; B. 6565

A well-preserved copper-alloy inter-pendant of teardrop shape. The flat face pendant has a knobbed terminal. From the centre of the upper part of the body raises a suspension neck. It was unearthed in a narrow room above the large room L. 5054.

Parallels – Bishop 1988, 98, Type 8; Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 1462-1463, Taf. 53).

Dimensions – Total length: 29mm; Length of body: 22mm; Maximum width: 16mm; Thickness of body: 0.5-1mm; Thickness of terminal: 3mm; Diameter of loop (inner): 3.5mm.

10. Pendant **PL. III.3AO: 3**

Inv. No.: Area R; L. 5027; B. 7830

This copper-alloy pendant has the outlines of a vine leaf (Bishop's type 4d). The much distorted pendant was not available for examination. Close parallels were reported from Rheingönheim (DE) and Mainz (Behrens 1913-1914, 68, No. 23, Abb. 2.20).

Parallels – Ulbert 1969a, Taf. 36: 12-13.

Dimensions – length: 40mm; width: 15mm; thickness: 0.5-1.5mm; bulbous terminal: 3x4.5mm.

11. Pendant **PL. III.3AO: 4**

Inv. No.: Area S; L. 5006; B. 7304

A copper-alloy pendant of teardrop shape. The pendant terminates with a semi-circle tip. Close examination reveals the faint outlines of an incised line that runs along the perimeter of the pendant – 2mm from its edge. The pendant underwent strong chemical treatment that stripped it from most of its original tinning or plating. The pendant was uncovered in a small chamber above the oil press complex, to which it seemingly belonged (storeroom?).

Dimensions – overall length: 51.5mm; width: 5.5-20mm; thickness of body: 0.5-1mm; width of loop: 3.5-5mm; diameter of loop (internal): 3mm; width of tip: 10mm.

Phalerae

12. *Phalera* **PL. III.3AP: 1**

Inv. No.: Area S; L. 5024; B. 7611

Cast copper-alloy disc. Its upper face is decorated with a series of concentric circles. The centre of the object is occupied by a raised dot surrounded by a small raised circle, while some three raised circles ornament its perimeter. Two rivets, spaced on both the centre's sides, used to attach the *phalera* to the leather strap that passed behind. The rear face is slightly concave. The phalera under went an aggressive chemical cleaning that deprived us from any further knowledge concerning possible tinning or plating.

Parallels – Bishop 1988, 94-95, Table 5, Figs. 39-42 (a variation of type 2h).

Dimensions – Diameter: 45mm; Thickness: 1-1.5mm; Diameter of holes: 1-1.5mm.

13. Pendant **PL. III.3AO: 2**

No available data, but the photo. A copper-alloy heart shaped inter-pendant. The body is pierced by a central hole.

Harness fittings

14. Harness plate (not illustrated)

Inv. No.: Area S; L. 2051; B. 3808-3

Rectangular plate. One small rivet still survived on its back. Similar objects were interpreted as harness plates (Unz and Deschler-Erb 1997, Nos. 1976-1987, Taf. 69 – with ample bibliography on p. 52).

Dimensions – Length: 30mm+; Width: 13mm; Thickness: 1mm; Length of rivet: 1mm.

14. Harness mount **PL. III.3AP: 2**

Inv. No.: Area T; L. 4034; B. 1014

Circular domed head harness mount with a short shank, bent in right angle. The tip of the shank is broken. The object was uncovered outside the Wall, east of the Towers in the collapse layers of the Wall. A scabbard mount was found in this locus (above F.8).

Dimensions – Diameter: 24mm; Thickness of head: 1mm.

III.4 – Magdala

Map ref.: 198 247

Other names: Taricheae; Migdal Nunia; Migdal Şebaya; Mejdel **PL. III.4**

Reference: *TIRIP*, 173; *NEAEHL* III, 965

Geography and history

A wooden boat was exposed south of Kibbutz Ginnosar, on the western shores of the Lake of Galilee during the drought of 1986 (**PL. III.4: 1**). In addition to this shipwreck, the remains of two more boats were found in that site. The excavators offered to associate the boat that was scavenged for parts with the naval battle of Tarichaeae in AD67 (The boat: Wachsmann 1990; Magdala: Galili, Dahari and Sharvit 1993, 76-77; The battle: Gichon 1995c).

Militaria

A pyramidal head was found in the mud that was removed from the boat and was associated with the naval battle that took place in this region (Syon 1990). The possible association with the naval battle is of particular interest as Josephus explicitly notes that archers manned the Roman rafts (*BJ* 3.525, 527).

Catalogue

I. Archery equipment

1. Iron bodkin arrowhead **PL. III.4: 2**

Site:.....Migdal
Excavation:.....Wachsmann (1986)
Provenance:.....Boat
Excavation No.:...Unknown
Material:.....Iron
Dimensions (from drawing) –
Total Length:.....38mm
Length of head:...34mm
Width of head:....10x8mm
Width of tang:.....3mm

The bodkin head (Syon 1990) is rhomboid in cross-section. Most of its tang is missing and the remaining part shows signs of bending. Similar heads were found at Meroth (III.1/I.2-3). Bodkin heads of square cross-section were further found in First Revolt related contexts at Meroth (III.1/I.1, 4-6), Gamala (III.3/I), and the Site of the Caves (III.5/I.1-35) and from the Second Revolt in the Sandal Cave (V.14/I.1) and the Spear Caves (V.17/I.1). See also the ROM collections (VI.5/I.1).

III.5 – The Site of the Caves

Map ref.: 1972 2559

Other names: Site 25-26

PL. III.5-5C

Geography

A complex of refuge caves is situated in the eastern cliff of Nahal Amud, eastern Galilee (**PL. III.5: 1**; Tepper, Drayin and Tepper 2000, 87-92). A difficult constructed ascent, of about 200m, leads to the site from a spring that lies below at the riverbed (Ein-Tina – 1970 2558).

History

The site was surveyed by Rabani 1958[30], and later by Tepper and Tepper. It is composed of a series of refuge caves and one large natural cave in its walls a few more refuge caves were hewn. In front of the caves, the remains of a massive structure were traced (10x90m) based upon a 3.5m high revetment wall. The height of the structure was estimated at 5-6m above its foundations, hence a façade of 8-9m high. According to the surveyors the two width walls of the building were constructed from ashlar stones, some of which have projecting bosses and back-set margins, typical to the Herodian period. Two towers, one semi-circular and one square in shape, fortified the site. Rabani reports that Early Roman pottery was collected in the site (**PL. III.5: 2**; Tepper, Drayin and Tepper 2000, 87).

According to Tepper, Drayin and Tepper, the Site of the Caves should be associated, with the fortification activities of Josephus Flavius in the Galilee at the commence of the First Revolt (*ibid.*, 94-96). According to his account, following the defeat of Cestius Gallus (AD66), Josephus fortified several cities and little towns in the Galilee (*BJ* 2.573). The surveyors assume that the site under discussion was conquest by Vespasian's forces during the elimination of the revolt in the Galilee.

Militaria

The excavators report about the gathering of arrowheads with square cross-section (*ibid.* 92, Fig. 100). Some of the heads were found stuck between the stones of the revetment wall, mentioned above. Nevertheless, an examination of the unpublished photos showed that, in addition to the bodkin type, part of the arrowheads belong to two distinct types of artillery bolts. The majority of the bolts constitutes of the iron square cross-sectioned type. Yet, three examples of a much rare type are present – a flat leaf-like head with a long and prominent tang (III.5/M.1-3). To the best of my knowledge, this type is reported to date merely from Thamusida (MR) (Boube-Piccot 1994, No. 474, 199, pl. 48) and Hofheim (DE) (Ritterling

[30] Unpublished survey of the IAA.

1913, 160, Pl. XVII, Figs. 26-28). The occurrence of two bolt heads types is interesting, particularly in light of the scarcity of the flat head. Theoretically, one may suggest the presence of two different artillery units, although the small size of the site hints otherwise. It may be therefore suggested that the two different types of artillery ammunition reflect a diversity of the ammunition within the same unit, and thus possibly the varied origins or tradition of the artillerymen as well.

Unfortunately, none of the artefacts was available for examination and the measurements were taken from the photographs.

Catalogue

* Unfortunately, the present whereabouts of the artefacts is unknown and all the given measurements were taken from the photographs.

I. Archery equipment

Tanged iron bodkin arrowheads

1. Iron tanged bodkin arrowhead **PL. III.5B: 2**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Length:.....64mm

An iron tanged bodkin arrowhead. The tip of its tang is damaged. Similar arrowheads are known from First Revolt context in Israel: Meroth (III.1/I.1-7); Gamala (III.3/I); Magdala (III.4/I.1). This type is further attested in Second Revolt assemblages: Sandal Cave (V.14/I.1); the Spear Caves (V.17/I.1).

2. Iron tanged bodkin arrowhead **PL. III.5B: 10**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Length:.....58mm+

Head is split due to corrosion. For parallels, see No. 1.

3. Iron tanged bodkin arrowhead **PL. III.5B: 5**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....3 ↄ
Material:.....Iron
Dimensions –
Total length:.....39mm+

Length of head:...25mm
Width of head:....17mm
Length of tang:....14mm+
Width of tang:.....5mm

Tip of tang is broken. For parallels, see No.1.

4. Iron tanged bodkin arrowhead **PL. III.5B: 7**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Total length:.....40mm

An iron tanged bodkin arrowhead. Most head is missing. For parallels, see No.1.

5. Iron tanged bodkin arrowhead **PL. III.5B: 4**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....2 ↄ
Material:.....Iron
Dimensions –
Total length:.....53mm+

Corroded tanged arrowhead, most tang is missing. For parallels, see No. 1.

6. Iron tanged bodkin arrowhead **PL. III.5B: 6**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....4 ↄ
Material:.....Iron
Dimensions –
Total length:...55mm

Corroded tanged arrowhead, most tang is missing. For parallels, see No. 1.

7. Iron tanged bodkin arrowhead **PL. III.5B: 8**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Total length:...65mm

Iron bodkin arrowhead, complete. For parallels, see No. 1.

8. Iron tanged bodkin arrowhead **PL. III.5B: 9**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Total length:...60mm

Iron bodkin arrowhead. Tang is bent, seemingly due to impact. For parallels, see No. 1.

9. Iron tanged bodkin arrowhead **PL. III.5B: 11**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Total length:...50mm

Iron bodkin arrowhead. The tip is bent, seemingly due to impact. For parallels, see No. 1.

10. Iron tanged bodkin arrowhead **PL. III.5B: 12**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ↄ
Material:.....Iron
Dimensions –
Total length:...40mm+

Iron tanged bodkin arrowhead. Most of the head is missing. For parallels, see No. 1.

11. Tanged iron bodkin arrowhead **PL. III.5A: 1 (middle)**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....2 Ш
Material:.....Iron
Dimensions –
Total length:.....51mm
Length of head:.....37mm
Width of head:.....5mm
Length of tang:.....14mm
Width of tang:.....3mm

Iron bodkin arrowhead. Part of the tang is missing. For parallels, see No. 1.

12. Tanged iron bodkin arrowhead **PL. III.5A: 1 (bottom)**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....3 Ш
Material:.....Iron
Dimensions –
Total length:.....47mm
Length of head:.....42mm+
Width of head:.....7mm
Length of tang:.....5mm+
Width of tang:.....3mm

Iron tanged bodkin arrowhead. Most of the tang is now missing. For parallels, see No. 1.

13. Tanged iron bodkin arrowhead **PL. III.5A: 2**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....1 Ո
Material:.....Iron
Dimensions –
Total length:...45mm+

Iron bodkin. Most of the tang is missing. For parallels, see No. 1.

14. Tanged iron bodkin arrowhead **PL. III.5A: 3**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....2 ת
Material:.....Iron
Dimensions –
Total length:...42mm

Iron bodkin. Most of the tang is missing. For parallels, see No. 1.

15. Tanged iron bodkin arrowhead **PL. III.5A: 4**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....4 ת
Material:.....Iron
Dimensions –
Total length:...58mm

Iron bodkin arrowhead. Near complete. Tang is slightly bent. For parallels, see No. 1.

16. Tanged iron bodkin arrowhead **PL. III.5A: 5**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....5 ת
Material:.....Iron
Dimensions –
Total length:...60mm

Iron bodkin arrowhead. Near complete. For parallels, see No. 1.

17. Tanged iron bodkin arrowhead **PL. III.5A: 6**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....6 ת
Material:.....Iron
Dimensions –
Total length:...45mm+

Iron bodkin arrowhead. Tang and tip is bent, due to impact. For parallels, see No. 1.

18. Tanged iron bodkin arrowhead **PL. III.5A: 7**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....7 ת
Material:.....Iron
Dimensions –
Total length:...55mm+

Iron bodkin arrowhead. Most tang is missing and tip is bent. For parallels, see No. 1.

19. Tanged iron bodkin arrowhead **PL. III.5A: 8**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....8 ת
Material:.....Iron
Dimensions –
Total length:...60mm

Iron bodkin arrowhead. The head is slightly damaged. For parallels, see No. 1.

20. Tanged iron bodkin arrowhead **PL. III.5A: 9**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....8 ת
Material:.....Iron
Dimensions –
Total length:...*c.* 40mm+

Much corroded tanged bodkin head. Part of the tang is still discernable. For parallels, see No. 1.

21. Tanged iron bodkin arrowhead **PL. III.5A: 12**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....10 ת
Material:.....Iron
Dimensions –
Total length:...53mm+

Iron bodkin arrowhead. Most of the tang is missing. For parallels, see No. 1.

22. Tanged iron bodkin arrowhead **PL. III.5A: 13**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....12 ת
Material:.....Iron
Dimensions –
Total length:...57mm+

Corroded head.

23. Tanged iron bodkin arrowhead **PL. III.5A: 14**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....13 ת
Material:.....Iron
Dimensions –
Total length:...56mm+

Iron bodkin arrowhead. The tang is corroded is bent. For parallels, see No. 1.

24. Tanged iron bodkin arrowhead **PL. III.5A: 15**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....14 ת
Material:.....Iron
Dimensions –
Total length:...49mm+

Iron bodkin arrowhead. Most of the tang is missing. For parallels, see No. 1.

25. Iron tanged bodkin arrowhead **PL. III.5A: 17-18**
Site:.....The Site of the Caves
Provenance:...Unknown

Reg. No.:.....16 ת
Material:.....Iron
Dimensions –
Total length:.....37mm

Bodkin arrowhead, tang is bent. For parallels, see No. 1.

26. Tanged iron bodkin arrowhead **PL. III.5A: 19**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....17 ת
Material:.....Iron
Dimensions –
Total length:...Indiscernible

Iron bodkin arrowhead. Most of the tang is missing. For parallels, see No. 1.

27. Tanged iron bodkin arrowhead **PL. III.5A: 16**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....19 ת
Material:.....Iron
Dimensions –
Total length:...40mm+

Iron bodkin arrowhead. Head is damaged, part of the tang is missing. For parallels, see No. 1.

28. Five parts of iron bodkin arrowheads **PL. III.5A: 20**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....20-24 ת
Material:.....Iron
Dimensions –
Total length:...Indiscernible

29. Tanged iron bodkin arrowhead **PL. III.5C: 1**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....1 ת
Material:.....Iron
Dimensions –
Total length:...63mm

Iron bodkin arrowhead. Complete. For parallels, see No. 1.

30. Tanged iron bodkin arrowhead **PL. III.5C: 5-6**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....2 ת
Material:.....Iron
Dimensions –
Total length:...42mm

Iron tanged bodkin arrowhead. Part of the tang is broken. For parallels, see No. 1.

31. Tanged iron bodkin arrowhead **PL. III5C: 3-4**

Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....3 ח
Material:.....Iron
Dimensions –
Total length:...38mm+

Iron tanged bodkin arrowhead. Part of the tang is broken. For parallels, see No. 1.

32. Tanged iron bodkin arrowhead **PL. III.5C: 2, 7-8**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....4 ח
Material:.....Iron
Dimensions –
Total length:...51mm

Iron bodkin arrowhead. Complete. For parallels, see No. 1.

33. Tanged iron bodkin arrowhead **PL. III.5C: 9-10**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....5 ח
Material:.....Iron
Dimensions –
Total length:...40mm+

Iron tanged bodkin arrowhead. Most of the tang is broken. For parallels, see No. 1.

34. Tanged iron bodkin arrowhead **PL. III.5C: 11-12**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....6 ח
Material:.....Iron
Dimensions –
Total length:...37mm+

Iron tanged bodkin arrowhead. Most of the tang is broken. For parallels, see No. 1.

35. Tanged iron bodkin arrowhead **PL. III.5C: 13-14**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....7 ח
Material:.....Iron
Dimensions –
Total length:...41mm+

Iron tanged bodkin arrowhead. Part of the tang is broken. For parallels, see No. 1.

Leaf-shaped tanged iron heads

36. Leaf-shaped tanged iron arrowhead ? **PL. III.5B: 1**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....ב
Material:.....Iron?
Dimensions –

Total length:.....69mm+
Length of head:...55mm
Width of head:....14mm
Length of tang:....14mm+
Width of tang:.....3-6mm

It is not clear whether the head should be regarded as an arrowhead or alternatively as an artillery bolt. It has two ribs that runs along its axis. As I was not able to examine the other face of the head, it may features the same outlines, though a trapezoid cross-section is also plausible. Such head is not represented elsewhere in Palestine.

M. Torsion artillery

Flat tanged iron bolts

1. Flat tanged iron bolts **PL. III.5A: 1**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....1 ש
Material:.....Iron
Dimensions –
Total length:.....105mm
Length of head:...50mm
Width of head:....12.5mm
Length of tang:....55mm
Width of tang:.....5.5mm

A rare flat leaf-like bolt head with a long and prominent tang. Theoretically, the head could have served as a spear head. Parallels are known merely from Thamusida (MR) (Boube-Piccot 1994, No. 474, 199, Pl. 48) and Hofheim (DE) (Ritterling 1913, 160, Pl. XVII, Figs. 26-28). One more complete example and an additional fragmentary head were found in the site (see below).

2. Flat tanged iron bolt **PL. III.5A: 10-11**
Site:.....The Site of the Caves
Provenance...Unknown
Reg. No.:.....9 ת
Material:.....Iron
Dimensions –
Total length:.....80mm
Length of head:...40mm
Width of head:....12mm
Length of tang:....40mm
Width of tang:.....5mm

For parallels, see No. 1.

3. Flat tanged iron bolt **PL. III.5C: 15-17**
Site:.....The Site of the Caves
Provenance:...Unknown
Reg. No.:.....8 ת

Material:.....Iron
Dimensions –
Total length:.....46mm+
Length of tang:....35mm
Width of tang:.....5mm

Only the tang and a small fragment of the head have survived. Similar to No. 1.

III.6 – Sepphoris

Map ref.: 1765 2398

Other names: Diocaesarea; Zippori; Saffuriye

PL. III.6-III.6G

References: *TIRIP*, 227-228; *NEAEHL* IV, 1324-1328

Geography

The city of Sepphoris is situated in the centre of the Lower Galilee. It was built on a hill that overlooks the Netofa valley (**PL. III.6: 1**). Two water aqueducts flowed from springs located east of the city. Additional source of water is the spring of 'Ein Zippori that spouts out some 2.5km south of the city.

History

In 55BC, Gabinius designated Sepphoris as the first city of the Galilee district (*AJ* 14.91; *BJ* 1.170). Herod took it during a snowstorm in 37BC in the course of his struggle with Mattathias Antigonus (*AJ* 14.414; *BJ* 1.304). Herod established in the city an armoury that was targeted by rioters, following his death (*AJ* 17.271; *BJ* 2.56; Vol. I, p. 258ff). The harsh Roman retaliation, under the command of Varus governor of Syria, resulted in the destruction of the city (*AJ* 17.289; *BJ* 1.68). It was rebuilt by Herod Antipas, Herod's son, an act that earned Sepphoris the title: 'ornament of all Galilee' (*AJ* 18.27). The inhabitants of the Sepphoris surrendered the city to Vespesian in AD66 and minted coins which honoured him as the 'peace maker' (*εἰρηνοπίος*) and the city as the 'city of piece'.

Militaria

A complete iron scale cuirass was found at the foot of the hill of Sepphoris, on the bedrock near the Byzantine street (**PL. III.6: 2-3**). The object was unearthed alongside three canine skeletons.

Catalogue

B. Armour

Scale armour

1. Iron scale cuirass

PL. III.6A-6G

Site:.....Sepphoris
Provenance:.....Bedrock (concelment or burial ?)
Expedition:.....Strange (1998-1999)
Excavation No.:...Sq. V.38
Material:.....Iron (scales), Copper alloy (wires)
Dimensions –
Length of scale:.....37-42mm
Width:.....20-22mm
Diameter of upper attachment holes:.....1-2mm

Thickness of copper-alloy wires:.....1-2mm
Weight of cuirass:.....3571gr

Fragment No. 1: 320x320mm;	Thickness: 90mm;	Weight:	2735.00gr	**PL. III.6A: 1-2**
Fragment No. 2: 205x145mm;	Thickness: 40mm;	Weight:	469.25gr	**PL. III.6B: 1-2**
Fragment No. 3: 120x75mm;	Thickness: 30mm;	Weight:	113.45gr	**PL. III.6C: 1-2**
Fragment No. 4: 100x90mm;	Thickness: 30mm;	Weight:	89.20gr	**PL. III.6D: 1-2**
Fragment No. 5: 115x70mm;	Thickness: 30mm;	Weight:	98.68gr	**PL. III.6E: 1-2**
Fragment No. 6: 75x50mm;	Thickness: 8mm;	Weight:	16.48gr	**PL. III.6F: 1-2**
Fragment No. 7: 70x40mm;	Thickness: 3mm;	Weight:	9.34gr	**PL. III.6G: 1-2**
Fragment No. 8:.....		Weight:	39.60gr	**PL. III.6A: 1**

The scale armour was partly revealed in Square V.38 in 1998 (**PL. III.6: 2-3**). It was initially erroneously identified as laminated armour. The preliminary report reads as follows:

> 'Between the pool in Square V.63 and the cistern in Square V.78, namely, in Square V.38, are rectangular cuttings in the bedrock with *terra rosa* and scraps of Herodian pottery. This may suggest a pre-Herod Antipas presence. Fragments of a Roman iron cuirass, perhaps of the type known as Lorica Segmentata, began to emerge on the last day of excavation in the *terra rosa* with the pottery of the first century BCE and CE. The iron cuirass was in very poor condition, but may have been deposited intact'.[31]

It was in the following season of 1999 that the armour was unearthed and conserved. According to Strange the cuirass was directly associated with three canine skeletons (Vol. I, p. 176). Unfortunately, the ferrous cuirass that was uncovered complete is in a very corroded state of preservation, which negates the possibility of studying its construction method beyond the observation of rows of scales that were seemingly attached to an organic backing or undergarment that is now lost. The rows were not attached to each other. The scales belong to Type 13 (Vol. I, p. 44), parallels for which are known from Second Revolt contexts in the Hebron hoard (V.31/B.2) and Tel 'Azeqa (V.11/B.1). This type of scale has an embossed mid-rib. Four small attachment holes are spaced in the upper centre and two pairs of lateral holes. The quadrate holes were used to attach the scales to the backing, while the two pairs of lateral holes fastened the scales to the adjacent specimen of the same row by copper-alloy wires (**PL. III.6: 5**).

The weight of the corroded folded cuirass is: 3.571kg. It may be compared with the shirt from Bertoldsheim (DE) that weighs: 3.496kg, although the latter may be incomplete. This notion is based upon the fact that the mail shirts weighs: 5.440kg – South Shields (UK) and 5.788kg – Wall's end (UK) (Croom 1997-98, 59).

[31] http://www.colby.edu/rel/archaeology/Sep98.html.

III.7 – Kh. el-Hamam (Narbata)

Map ref.: 1628 2017

Other names: Kh. el Khurab; Birket el Khurab; Arubboth

PL. III.7

Reference: *TIRIP*, 193; *NEAEHL* II, 563-565

Geography and history

The site of Kh. el-Hamam is situated in the northwest district of Samaria (Zertal 1995; **PL. III.7: 1**). The analysis of the excavations and the historical data brought the excavator to identify the site with Narbata (*BJ* 2.291), which came to ruins during the Judaean campaign of Cestius Gallus (*ibid.*, 508; Zertal 1995, 92ff). A siege system that is dated to this battle was surveyed and excavated at the site (**PL. III.7: 2**; Zertal 1995).

Militaria

The preliminary report specifically notes the small number of *militaria* uncovered at the site: 8 arrowheads and 21 *ballista* balls. According to Zertal this may suggests that the rebels surrendered to the Romans before the completion of the circumvallation (Zertal 1995, 91). In addition, two gilded *phalerae* were unearthed at Kh. el-Hamam (Zertal, *pers. comm.*).

Catalogue

I. Archery

1. Group of eight iron arrowheads

Some eight iron arrowheads, seemingly of the trilobate type were found.

M. Torsion artillery

1. Group of twenty-one *ballista* balls

An overall number of 21 *ballista* balls were found at the site. No further details concerning their calibre and distribution were available.

Q. Riding equipment

1. Two gilded *phalerae*

Two gilded copper-alloy *phalerae* were uncovered in the excavations (Zertal, *pers. comm.*). They presumably served as harness decorations. For the use of gold: Vol. I, Appendix 1.3 (*e*).

III.8 – Kalandia

Map ref.: 1698 1419

Other names: Qalandiyeh

PL. III.8

References: *TIRIP*, 206; *NEAEHL* IV, 1197-1200

Geography and history

A manor house of the Second Temple period, situated 8 km NW of Jerusalem. It was excavated by Magen in 1978 and 1981 (**PL. III.8: 1-2**; Magen 1984, 61-71). Established in the 3rd century BC, the farm that produced mainly wine, thrived in the 2nd century BC (*ibid.*). During the 1st century AD, the industrial focus was shifted to stone quarry, in all probability serving the raising demand for masonry stones in adjacent Jerusalem. In the preliminary publication Magen relates the destruction of the site to the Cestius Gallus campaign (Magen 1984).[32] However, in the more recent entry of the *NEAEHL* Magen concluded, on the basis of pottery and numismatic evidences (including the find of revolt coins), that the site came to ruins during the First Revolt (*NEAEHL* IV, 1200).

Militaria

A single copper-alloy scale was found in Building C, in the destruction layer of the First Revolt (**PL. III.8: 3**). Such isolated finds normally suggest accidental loss, like natural fatigue of the attachment wire. However, the sign of blow upon the scale's body hints for the cause of detachment.

Catalogue

B. Armour

Lorica squamata

1. Scale **PL. III.8: 3**

Site:.....Kalandia
Expedition:.....Magen (1981)
Provenance:.....Manor house
Excavation No.:...Unknown
Material:.....Copper alloy (brass?)
Dimensions:.....Unavailable

Published by Magen (Magen 1984, 70, photo on p. 71 – note it is presented upside down), the scale was cut from a copper-alloy (seemingly brass) sheet and two pairs of holes were punched at its upper part. A typical midrib runs along its axis. Although the dimensions of the scale were unavailable the scale clearly belongs to Type 2, which is presented elsewhere in

[32] About Gallus's campaign, see Gichon 1981a and Goldsworthy 1996, 84-90.

Palestine at Masada (Vol. I, p. 43). The mid part of the scale shows clear signs of battle damage, a blow that may have been the cause for its detachment from the body of the armour.

III.9 – Hizmah

Map ref.: 1755 1385

References: *TIRIP*, 147

PL. III.9

Geography and history

A stone-vessels' industrial complex was found next to the village of Hizmah, North of Jerusalem (**PL. III.9: 1-2**; Magen 2002). An additional complex was recently unearthed on the north-eastern slope of Mount Scopus. These vessels, made of limestone, which is typical of the Jerusalem district, are a *fossile directeur* for Jewish presence. According to the Jewish ruling, stone vessels were not susceptible of impurity (Kel 2.1). They became very popular during the Second Temple period, particularly from the time of Herod the Great. The complex was destroyed during the First Revolt in AD70.

Militaria

Among the few metal utensils found in Cave 1 was an iron point with three vanes. Though stating it was first thought to be an arrowhead, Magen identifies the point as a drilling bit used in the production of stone vessel. Yet, this identification is not valid in light of the new discoveries made at the Mount Scopus cave, where iron drilling parts and lathe's remnants were uncovered.

Catalogue

I. Archery

Iron tanged trilobate arrowheads

1. Iron tanged trilobate arrowhead **PL. III.9: 3**

Site:.....Hizmah
Provenance:.....Industrial cave (stone-vessels production)
Expedition:.....Magen (1995)
Excavation No.:...83/690
Material:.....Iron
Dimensions –
Length:.....36mm+
Length of blade (estimated):...*c.* 44mm
Length of tang:.....1mm+
Width:.....15mm

A trilobate head with broken tang and tip. Interestingly, one of its vane is shorter then its accompanying pair. Magen published the object as a drill-bit (Magen 2002, 61, Fig. 2.63, No. 1). Parallels: T-like cross-section: Dura-Europos (SY) (James 1990, Pl. 2.6.E); Exeter (UK) (Holbrook and Bidwell 1991, 265, No. 18, Fig. 121).

III.10 – Jerusalem

Map ref.: 171 132

Other names: Hierosolyma; Ierusalem; Aelia Capitolina

PL. III.10

'in qua fuere Hierosolyma, longe clarissima urbium orientis, non Iudaeae modo' (*NH*, 5.15.70).

Geography and history

The Jewish capital of Judaea, location of the governmental and spiritual institutions, most notably the Temple **(PL. III.10: 1)**. At its peak, towards the First Revolt, the boundaries of the walled city encompassed some 1800 dunams, the population of which was estimated at 80000 inhabitants. In the Second Temple period the city occupied two main hills: the southwestern hill, upon which the 'Upper City' was erected, included the area of the present Jewish and Armenian quarters, as well as Mount Zion and the southeastern slope of the hill. The second hill, 'Acra', comprised of the 'Lower City'; that is the City of David, the Ophel, and parts of the Mount Moriah (Temple Mount), as well as the valley that run between the two hills – the Tyropeon – down to the Siloam Pool. A third hill, which according to Josephus was lowered by the Hasmonaean rulers, covers the northwestern part of the present Temple Mount and a limited sector north of it. During the mid-1st century AD the northern hill of Beth Zaitah, which is the highest hill, was added to the city and served as the construction ground for the 'New City'. The city was bordered from the east by the Qidron valley and from the west and south by the valley of Hinom.

In addition to a wealth of cisterns and several large pools, two aqueducts fed the city with springs' water. The only spring in its boundaries is the Gichon that flows in the City of David.

The manifestation of the Roman introduction to Judaea and the end of the Hasmonaean independence govern was the conquest of Jerusalem by Pompeius in 63BC (*AJ* 14.67-71; *BJ* 1.1-5). Gabinius, Governor of Syria prevented Alexander son of Aristobulus to reconstruct the city's walls (57BC). The walls were rebuilt by Antipater in 48BC and appointed his sons Phasael and Herod as governors (*AJ* 14.326). The city was attacked by Matthias Antigonus in 40BC following the Parthian invasion. Herod subdued it in 37BC with the active participation of Roman military units. During his reign the city under went great transformation, that included many construction projects, the most notable of which were the king's palace in the Upper City and the renovation of the Temple's structure and its compound. After his death (4BC), the city came under the rule of his son, Archelaus. The riots that broke in the city intensified following the acts of Sabinus which capture the Temple, plundered its treasure and burnt its colonnades. The uprising was brutally eliminated by Varus the governor of Syria. The annexation of Judaea into the Roman Empire (6AD) symbolized devaluation in the status of the city, as Caesarea became the Province's administrative capital. A garrison permanently

stationed in the city, the base of which was the Antonia fortress. The reign of the Roman procurators (14 governors) was a period of unrests and permanent disturbances. During the first half of the 1st century AD the city expanded to the north and witnessed a growth in its population. The construction of the Third Wall, that was initiated in 41-44AD by Agrippa I, in order to defend the city from the north was halted by the Roman Emperor and was completed only during the First Revolt.

The city was described as one of the most celebrated metropolis of the East (Philo *EG* 281; *HN* 5.70). The riots that erupted in the city in AD66 spread throughout the country leading to the outbreak of a war with Rome (*Bellum Judaicum*). Josephus narrates the occurrences that took place during this period of time, climaxing in the Roman siege under Titus and the conquering and destruction of the Temple and the city. Four legions participated in the siege – *V Macedonica*, *X Fretensis*, *XII Fulminata* and *XV Apollinaris*. *legio X Fretensis* was left to camp in the city.

Our knowledge concerning the period between the two Jewish revolts is very scant. The whereabouts of *legio X Fretensis*'s camp is still under dispute, but it appears that the location of which have changed at least once (Stiebel 1999). The decision to establish a Roman colony in place of the ruined city fell during Hadrian's visit at Judaea in AD130 – *Colonia Aelia Capitolina*. Although contradicting historical references, recent discoveries of the colony's coins in hoards from Second Revolt contexts suggest that its establishment predated the outbreak of the Second Revolt (also: Dio 69.12.1).

III.10a – Warren's expedition

A cheekpiece from the collections of the PEF (VI.4/A.1), the records of which conjectured it has originated in Warren's excavations. Captain Charles Warren conducted a series of archaeological explorations between 1867-1870 in the Old City and its environs. However, as James noted in the publication of the object, there is no evidence to support (or negate) this suggestion (James 1986a).

III.10b – Bliss and Dickie's expedition

During the closing of the 19th century (1894-1897), Bliss and Dickie conducted archaeological excavations throughout the area city. Several findings of military orientation may be traced in their publication (Bliss and Dickie 1898).

Catalogue

B. Armour

Laminated armour ('*lorica segmentata*')

1. Buckle hinge plate **PL. III.10: 2**
Site:.....Jerusalem
Provenance:...Unknown
Expedition:....Bliss and Dickie (1894-1897)
Material:.....Copper alloy
Dimensions –
Length:.....24mm
Width:.....12mm
Loop:.....13.5mm+
Length of tongue:...18mm

Published as bronze buckle (Bliss and Dickie 1898, 267; Pl. XXVIII: No. 63) the artefacts is a D-shaped buckle hinge of a '*lorica segmentata*'. Its loop is folded over and broken. It was found inside the gate near the Siloam.

V. Chariots and cart fittings

1. Iron tyre (not illustrated)
Site:.....Jerusalem, Lower City
Provenance:...Stepped street (leading down to the Siloam Pool)
Expedition:....Bliss and Dickie (1894-1897)
Material:.....Iron
Radius:.....254mm (10 in)
Width:.....44.45mm (1¾ in)
Thickness:.....31.75mm (1¼ in)

Fragments of the iron tyre were uncovered by Bliss and Dickie above the Tyropœon – the main stepped road of the Lower City of Jerusalem (Bliss and Dickie 1898, 267). The 'fragment of iron, which, when put together, turned out to be part of the tyre of a chariot wheel, having a 10-inch (254mm) radius. The pieces measured 1¾ inches (44.45mm) in width, and 1¼ inches (31.75mm) in thickness. They were perforated with holes, showing where the tyre had been riveted on to the wheel' (Bliss and Dickie 1898, 267). No illustration of the object was available. This example differs from the Western specimens, which were not nailed in place (Manning 1985, 70-71, Pl. 30, H30).

III.10c – Beth Zaitah

Map ref.: 1726 1319

History

In 1995, Eli Shukrun and Ronny Reich of the IAA conducted a small-scale excavation 60m east of the northeastern corner of the Temple Mount's compound (Shukrun and Reich 1999). One of the excavated layers contained the architectural remains of a neighbourhood of the Second Temple period, which the excavators identified with the neighbourhood of Beth Zaitah (Bezetha) (*BJ* 2.328; 530; 5.149, 151, 246). This stratum was destroyed during the Roman conquest of Jerusalem (AD70).

Militaria

In Area B, several *militaria* objects were uncovered, among which the excavators note *ballista* balls, slingshots, an iron arrowhead and possibly a lance butt. The importance of the finds lay in the pinpointed date of usage and their direct association with a well-documented historical event. In Jerusalem only relatively few artefacts may be directly ascribed to the time of the Roman siege, most notably the excavations in the Upper City (below: III.12). The objects still await publication.

III.11 – Jerusalem, Third Wall

References: *NEAEHL* II, 744-745

Geography and history

Towards the mid-1st century AD Jerusalem was fortified by three walls, the northern of which and the last to be erected is known as the 'Third Wall'. Josephus provides a detailed description concerning the course of the Wall, its nature and the circumstances that relate to its construction (*BJ* 5.147-155; 2.218; *AJ* 19.326-327). According to his accounts the building commenced under Agrippa I (AD41-44) and was concluded only during the First Revolt (AD66-70).

Robinson was the first to identify actual remains of the Wall (1838). It was mainly the archaeological work of Sukenik and Mayer (1925-1927, 1940), which exposed large sections of the Wall. The fierce debate that surrounded the interpretation of this line of fortification as Third Wall, around the mid 20th century, appears to be resolved following the excavation in the 1970's and the last decade that verified Sukenik and Mayer's suggestion (**PL. III.11: 1**).

Militaria

A single *ballista* ball was uncovered in adjacent to the wall during Sukenik and Mayer's excavation. The collection of the church of Saint Etienne contains two *ballista* balls.[33] The immediate relation to the Third Wall – the church is situated less than 100m south of the line of the Wall – may offer an elucidation for their origin.

Catalogue

M. Torsion artillery

Ballista balls

1. *Ballista* ball **PL. III.11: 3**

Site:.....The Third Wall
Provenance:.....Square E-15 (Adjacent to the Wall)
Expedition:.....Sukenik and Mayer (1925-27)
Excavation No.:....Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...300mm
Weight:.....~2350gr

The limestone ball, published in the excavation report (Sukenik and Mayer 1930, 43-44, Fig. 37) was unearthed adjacent to the wall segment excavated in square E-15 (**PL. III.11: 2**). It

[33] I wish to thank Boaz Zissu and David Amit for bringing the objects to my attention, and providing their measurements.

was found next to the south face of the Wall, that is within the city's boundaries. The stone relates to the category of large calibre shots (see also items 2 and 3).

2. *Ballista* ball (not illustrated)
Site:.....Saint Etienne church
Provenance:.....Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...~240mm

The stone from Saint Etienne belongs to the large calibre category (see also next item).

3. *Ballista* ball (not illustrated)
Site:.....Saint Etienne church
Provenance:.....Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...~190mm

See previous item.

III.12 – Jerusalem, Upper City

Other names: Jewish Quarter excavations **PL. III.12-III.12C**

Geography and history

The 'western-hill' of Jerusalem (Mount Zion), was first settled towards the end of the First Temple period (late 8th century BC). Following Nebuchadnezzar's destruction (586BC) it was deserted for nearly 400 years. The re-occupation of the hill was presumably commenced in the early 2nd century BC. The growing population, and consequently the overcrowdness in the 'City of David', was one of the reasons for the expending of the city westwards. It was also then that Hellenic spirits pushed their way into Palestine and particularly in Jerusalem. Hellenised Jewish groups, which held key positions, were the catalysts for the process that was best asserted by the development of the settlement at the 'Western Hill'. The desire to construct in Jerusalem, a settlement that will follow the Hellenic urban plan accorded well the wide-open area in the west. It was there that several Hellenistic institutes were constructed along with the Palace of the Hasmonaeans, all presumably set in an orthogonal plan. The area has become known as the Upper City of Jerusalem, and was occupied by its wealthiest citizens. The extensive archaeological work, which was carried out between 1969 and 1978 under the directory of Prof. Avigad, unearthed large parts of this area (**PL. 12: 1**; Avigad 1983).[34] Overcoming strenuous obstacles, the excavators revealed some of the most extraordinary evidences for the last days of Jerusalem, so vividly described by Josephus. In his account Josephus dedicated a distinguished part for the narration of the siege by Titus's army that climaxed in 8th of *Elul* (Gorpiaeus) AD70 (20 September AD70) (*BJ* 6.374-434).

Militaria

Military equipment was found in varied areas. Of interest are the finds from to the Herodian period, and particularly significance is the equipment that was found in the destruction layer of AD70.

Catalogue

* Please note that the material hereby presented, from the Jewish Quarter excavations by the kind permission of Hillel Geva, was not published, unless otherwise noted. Hence, it may not be used or reproduced elsewhere!

[34] Hilel Geva to whom I thank for the permission to analyse the military finds currently directs the study and the publication of the excavation.

B. Armour

Laminated armour – '*lorica segmentata*'

1. Buckle hinge plate (not illustrated)
Site:.....Jerusalem, Upper City
Expedition:.....Avigad
Excavation No.:...Area B: L213; B4579
IAA No.:.....82-349 (Neg. 155334)
Material:.....Copper alloy
Dimensions –
Width:...27mm

A complete D-shaped buckle with a single pin that fasten the folded over plate (see next item). Parallels in Palestine are reported from: Masada (III.19/B.5-6), Gamala (III.3/B.9-10) and Jerusalem (III.10/B.1). See next item.

2. Buckle hinge plate **PL. III.12: 4**
Site:.....Jerusalem, Upper City
Expedition:.....Avigad
Excavation No.:...Area E: L707; B7459
Material:.....Copper alloy
Dimensions –
Length:...15mm
Width:....18mm

D-shaped buckle. The hinge appears to be of iron. See previous item.

Composite armour

3. Fragment of an iron mail shirt coated by copper-alloy scales **PL. III.12: 2-3**
Site:.....Jerusalem, Upper City
Expedition:.....Avigad
Excavation No.:...Area E; L. 736; B. 7934 + 8247
Material:.....Iron and copper alloy (brass?)
Dimensions –
Length of scales:.....10mm
Width of scales:.....10mm
Thickness of scales:....~0.5mm
Diameter of holes:.....1-1.5mm

Two groups of 10-12 and 4-6 copper-alloy scales, the first of which still adheres to a rusted fragment of an undergarment iron mail. Along the axis of the minute scales (10mm long) runs a midrib, while three holes are located along its upper breadth. This find belongs to a composite type of armour, at times referred to as '*lorica plumata*' (Vol. I, pp. 49-50). This example is dated to the destruction of AD70. Examples are documented in 1st century AD date at Ausburg (DE) (*ibid.*, 173, Pl. 484), Ouddorp (NL) (*ibid.*) and Newstead (UK) (Curle 1911, 161, Pl. XXXVIII, Fig. 8; Robinson 1975, 173, Pl. 481 – upper). However, unlike the Jeruselmite example, the scales that relate to this type, normally feature 3 pairs of holes. Small scales with six (3 pairs) of upper link holes are known in the East at Tel Megiddo (IL)

(V.4/B.4) and from Dura-Europos (SY) (Clemetson 1993, 9). In the West: Corbridge (UK) (Anstee 1953; Robinson 1975, 154, Fig. 162, Pl. 439; Clemetson 1993, 8-9); Caerleon (UK) (Clemetson 1993, 9, note 7), Great Chesters (UK) (Allason-Jones 1996, 193, No. 37, Fig. 10), Vindobona (AU) (Neumann 1967, 54, Taf. XXXVI, 1) and Carnuntum (AU) (von Groller 1903, 103, Fig. 47).

F. Edged weapons

1. Sheathed *gladius Hispaniensis* **PL. III.12A: 1-4**
Site:.....Jerusalem, Upper City
Expedition:.....Avigad
Provenance:.....Plastered channel
Excavation No.:...Area T-6; L. 54; B. 918 (IAA No.: 94-2345)
Material:.....Iron + oxidised organic remains (wood and leather) + copper alloy
Dimensions –
Total length:.....730mm
Length of blade:.....596mm
Length of blade's point:.....230mm
Width of blade (max.):.....~46mm
Width of blade – at shoulders:.....39.5mm
Width of blade – at 93mm from shoulders:...38mm
Thickness of blade:.....~8-16mm
Length of sheath:.....586mm
Width of sheath's binding:.....~7mm
Thickness of sheath's binding:.....~12mm?
Length of tang:.....134mm
Thickness of tang (min.):.....9mm
Width of tang (min.):.....10mm
Diameter of pommel's rivet:.....23.5mm+
Length of preserved handle:.....90mm (59mm?)
Diameter of preserved handle:.....25mm

Complete sword, with U-binding scabbard. The sword belongs to the *gladius Hispaniensis* type. It was uncovered in a plastered channel (**PL. III.12A: 4**). Complete parallels are attested in Masada (III.3/F.1) and Beit Caiphus, Jerusalem (II.3/F.1). For the earliest example in mid-2nd century Palestine see: Stiebel 2004a. The near 600mm long blade (596mm) is waisted. A corroded remains of the handle that still adhere to the tang have preserved to the length of at least to 59mm, the entire length of the handle assemblage was 90mm long (**PL. III.12A: 3A-C**). The fastening rivet that crowned the pommel and the end of the tang is still visible.

The surface of the blade exhibits the corroded remains of the organic components of the scabbard. It had a U-guttering frame, typical of examples from Palestine and the Western examples of the Mainz-type (**PL. III.12A: 3C – note arrow**).

G. Belt fittings

1. Caterpillar stud **PL. III.12A: 5**
Site:.....Jerusalem, Upper City

Provenance:.....Above a Herodian floor (destruction in AD70)
Excavation No.:...Area E; L. 701; B. 7011 (15857)
Expedition:.....Avigad
Material:.....Copper alloy + Niello
Dimensions –
Length:.....26mm
Width:.....6mm
Thickness:.....4mm
Width of grooves:...1mm
Length of pins:.....5mm
Thickness of pins:...2mm

The only example yet uncovered in Palestine of the caterpillar stud is reported from Area E. The grooves on the face of the cast mount still retain niello, a phenomenon further attested in the West (Allason-Jones 1989). The object was found above a stone paving that was laid by Herod during the early years of his reign. The floor came to ruin in AD70. Its date *c*.30BC-AD70, accords the suggested appearance date of the type in the 1st century AD, previously believed to be the 2nd-3rd century AD (*ibid.*).

Parallels: Corbridge (UK) (*ibid.*, 10-11, Fig. 2: 1-3), South Shields (UK) (Miket and Allason-Jones 1984, 237-238, No. 3.878 – with references), Weißenburg (DE) (Oldenstein 1976, Nos. 727-729, Taf. 58), Évreux (FR) (Fauduet 1992, 106-107, Nos. 728-803).

Bone frogs

2. Bone frog **PL. III.12A: 6**
Site:.....Jerusalem, Upper City
Expedition:.....Avigad
Material:.....Bone
Dimensions –
Length:.....~35mm
Diameter of head:...~18mm
Width of shank:.....~19mm

A photo of bone frog was included in the popular publication of the excavations (Avigad 1983, Fig. 236 – centre). The triangular shank is pierced by a drilled circular hole (8mm). In Palestine, parallels are known at Masada (III.19/G.13-20) and Gamala (III.3/G.3).

H. Shafted weapons

1. Iron spear **PL. III.12B: 3-4; III.12C: 1-2**
Site:.....Jerusalem, Upper City
Provenance:.....Basement of the 'Burnt House'
Excavation No.:...Area B; L. 203; B.4718 (IAA No.: 82-2049)
Expedition:.....Avigad
Material:.....Iron
Dimensions –
Total length:.....425mm
Length of head:.....72mm
Thickness of head:...3-5mm
Width of shaft:.....20mm (18-23mm)

Thickness of shaft:...5mm (5-8mm)

During the excavations, a rare type of shafted arm was found in an extraordinary context. Uncovered in the destruction layer of a basement of a house (Area B), known as the 'Burnt House' (**PL. III.12B: 1-2**), the iron spear was exposed, leaning against the corner of one of its rooms, as it had been supposedly left by its owner (**PL. III.12B: 3**). The house was the residence of the priestly family Kathros, as attested by an inscribed weight found in its ruins. The Kathros family is documented in the ancient rabbinical sources. The date of the spear's deposition was seemingly 8th of month Elul (Gorpiaios?) AD70, when Titus' forces stormed the Upper City of Jerusalem (*BJ* 6.8-10). Josephus further refers to the atrociousness that accompanied the conquest, narrating to rivers of bloods that gushed down the stone-paved streets of the city. A more picturesque illustration for which is found in the forearm of a young woman exposed on the steps leading to the kitchen of the 'burnt house' (Avigad 1983, 137, Fig. 138). An iron spear was found leaning against on of the corners of Room 3 (*ibid.*, Fig. 139). Avigad interpreted this find: 'this may have been the personal weapon of one of the household, who had put it in a readily accessible place but never managed to use it' (*ibid.*, 125).

The hammered iron spear is composed of a 353mm rectangular-sectioned shaft that is crowned by a 72mm flat leaf-shaped head (over all length: 425mm) (**PL. III.12B: 4; III.12C: 1**). There is no evidence for the existence of a wooden haft, hence spear was seemingly simply held by hand (**PL. III.12C: 2**). The lack of a haft is supported by the position of the spear upon discovery. This fact as well as its outline seemingly suggest that the weapon was employed as a shock rather than a disposable weapon. Spears that had been designed as shock weapons were employed during the Second Revolt: the Site of 'Bypass Shoham' (V.10/H.1), and the Site of Nahal Yattir (V.33/H.1). The distinctly non-Roman traits as well as the spear's somewhat crude and simple construction appear to assign it to the local forces, suggesting it was manufactured in Jerusalem (*BJ* 2.649).

K. Slingshots

1. Leaden slingshot **PL. III.12C: 3**

Site:.....Jerusalem, Upper City
Provenance:.....Stratum 5
Excavation No.:...Area A; L. 41; B. 1852 (square G-12)
Expedition:.....Avigad
Material:.....Lead
Dimensions –
Length:.....32mm
Diameter (max.):...16-17.5mm
Weight:.....46.68gr

A Herodian dated leaden shot (Zitronblat and Geva 2003, M 51). Damaged surface. The funnel scar is visible. See also next item.

2. Leaden slingshot (not illustrated)
Site:.....Jerusalem, Upper City
Excavation No.:...Area J; L. 1310; B. 3463
Expedition:.....Avigad
Material:.....Lead
Dimensions –
Length:.....30mm
Diameter (max.):...20mm

The leaden slingshot was uncovered in a Second Temple period's context, with a *terminus ante quem* of AD70. See previous item.

Stone slingshots

3. Stone projectile **PL. III.12C: 4**
Site:.....Jerusalem, Upper City
Provenance:.....Stratum 4
Excavation No.:...No. 27, Area W, L.3099
Expedition:.....Avigad
Material:.....Stone

Stone projectile, possibly a slingshot. Dated to the mid 2nd–1st cent BC (Reich 2003, 269, No. 27, Pl. 8.5).

M. Torsion artillery

Catapult bolts

1. *Catapult* bolt? **PL. III.12C: 5**
Site:.....Jerusalem, Upper City
Provenance:.....Stratum 1
Expedition:.....Avigad
Excavation No.:...Area A; 3200; L. 86
Material:.....Iron
Dimensions –
Length:.....110mm
Width:.....20mm
External diameter of socket:...14mm

Iron socketed bolt (Zitronblat and Geva 2003, 355, M10, Pl. 14.1). The head has a square cross-section and the socket exhibits a narrow slit. It was erroneously compared with Manning's Type IIa, (Manning 1985: 170ff, Pls. 82-85: 141-253) and finds from Gamala (Gutman 1994, 96).

III.13 – Jerusalem, West Wall

PL. III.13

Some 35 stone balls were uncovered along the western sector of the First Wall in the 1970's by Magen Broshi (**PL. III.13: 1**; Shatzman 1989, 473). Only five stones were uncovered complete, a fact seemingly attesting the employment of the balls and the force of impact. Of the group, 10 balls appear to be slingshots: 3 weighs under 250gr, while 7 more shots fall under the category of the ammunition of the *funda librilia* (Chapter 5 (ii) *b*). The other 25 balls cluster between 600gr and 4.5kg, all seemingly dating to the siege of AD70.

III.14 – Jerusalem, the Armenian Garden

PL. III.14

Tushingham interpreted uncovered deposits in the excavations of the Armenian Garden, as the remains of *legio X Fretensis* (**PL. III.14: 1**; Tushingham 1985, 60-64). However, it is clear that his discussion is based on the traditional assumption that the camp of the Legion was located nearby on the Southern-Western Hill (Zion), one that should be rejected on varied grounds (most recently – Stiebel 1999). The only relevant remains, several broken stamped tiles of the legion, cannot serve as a concrete evidence.

Militaria

Tushingham associated two leaden slingshots and a large *ballista* ball with the activity of the Roman army (Tushingham 1985, 64, Fig. 70.34, Pl. 117). However, I find this determination difficult as none of these finds is indicative to the Roman period, nor was it uncovered in clean Roman contexts. Indeed, the pellet was found in a 'very mixed deposit' (*ibid.*), which cannot be of any assistance. Moreover, contrary to Tushingham opinion, these embalms on pellets were certainly not related to *legio X Fretensis*, and commonly appear on Hellenistic bullets. Winged *fulmen* motif, for example, decorates sling bullets from the nearby excavations of the Citadel of Jerusalem in a Hellenistic context (Sivan and Solar 1984, 114), as does the trident symbol. In Palestine, there is to date no evidence for the existence of decorated *glans*, in clean contexts, later than the 1st century BC.

Catalogue

K. Sling

Slingshots

1. Leaden slingshot **PL. III.14: 2**
Site:.....Jerusalem, Armenian Garden
Provenance:.....Fill (robbing of wall?)
Expedition:.....Tushingham 1961-1967
Excavation No.:...Unknown
Material.....Lead

The leaden slingshot was uncovered in a mixed deposit in the fill of the robbing of wall 312 in Square IV (Tushingham 1985, 64, Fig. 70.34). It bears the cast winged *fulmen* emblem that is commonly found on both Hellenistic and Roman *glandes* (Stiebel 1997b, 301).

2. Leaden slingshot **PL. III.14: 3**
Site:.....Jerusalem, Armenian Garden
Provenance:.....Fill (L A156.1)
Expedition:.....Tushingham 1961-1967
Excavation No.:...Unknown
Material.....Lead

Additional leaden slingshot was uncovered in a 'very mixed deposit on Ophel', the faces of which exhibit a winged *fulmen* and pointed *fuscina* (Tushingham 1985, 64, Pl. 117).[35] Although Tushingham linked the trident with the world of marine symbols that typified the *legio X Fretensis*, it once more must be stressed that the trident motif was not confined to the Roman period and is commonly found on Hellenistic lead pellets as well.

M. Torsion artillery

1. *Ballista* ball (not illustrated)
Site:.....Jerusalem, Armenian Garden
Provenance:.....Unknown
Expedition:.....Tushingham 1961-1967
Excavation No.:...Unknown
Material.....Limestone (?)
Dimensions –
Diameter:.....~80mm

Tushingham published a photo of a *ballista* ball 'similar to one published by Sukenik and Mayer 1930' (Tushingham 1985, Pl. 184). However, the diameter of 80mm clearly indicates that the stone belongs to the low calibre shots (Herodium: Stiebel 2003a, 217-218; Masada: Holley 1994, Table 1), unlike as the stone from the Third Wall that features the diameter of 300mm and weighs 23.5kg.

[35] See: http://www.thrace.0catch.com/slings_main.htm.

III.15 – Binyanei Ha'uma

Map ref.: 1693 1326

Other names: Binyaney Ha'ooma, Sheikh Bader, Giv'at Ram

PL. III.15-III.15B

Geography and History

The site of Binyanei Ha'uma is situated on the upper slopes of an elongated spur, 1.5 Roman miles west of the ancient city of Jerusalem, on the route of the road leading to the city (**PL. III.15: 1**). The excavations, which took place in 1949 and 1967 by Avi-Yona and more extensively in 1992 by Arubas and Goldfus, have revealed a legionary ceramic production and industrial area, that inherited a Jewish village of potters which came to ruins in AD67 (**PL. III.15: 2**). The Roman site lasted to the very end of the 3rd century AD when *legio X Fretensis* was relocated at Aila (Arubas and Goldfus 1994; Arubas and Goldfus 1995).

Militaria

The industrial site contained several military fittings: a typical terminal of a *gladius* scabbard, a reeded mount of scabbard and a harness heart-shape pendant. In addition, a possible model sword was there recovered. The terminal of the scabbard and the pendant were both found in the drying area of the clay products, a layer that sealed the Jewish settlement that came to ruins in AD70. This stratum dates between AD70 and the 3rd century AD.

Catalogue

F. Edged arms

Scabbards

1. Terminal of gladius's scabbard chape **PL. III.15A: 1**

Site:.....Binyanei Ha'uma
Provenance:.....Legionary *fabrica* – drying layer
Expedition:.....Arubas and Goldfus (1992)
Excavation No.:...L.5025; B.51128
Material:.....Copper alloy
Dimensions –
Length:.....18mm+
Height of terminal:.....11mm
Diameter of terminal.....15mm

The typical terminal of the *gladius*, scabbard chape. Slightly stout in proportions, the terminal has a small nipple. The corroded remains of the scabbard frame are visible. The object was fund in a thick and levelled layer of broken bricks and tiles, which was seemingly used as a drying level of the tiles fabrica of the *legio X Fretensis* (level: 821.77). This stratum sealed the walls of the Second Temple settlement, hence it postdates year AD70 and continued into the 3rd century.

In Palestine this type is attested mainly in First Revolt contexts (Gamala, Masada and Camp F – Masada). A silver plated example equipped L. Magus scabbard. Numerous parallels were documented throughout the Roman world (bibliography: Unz and Deschler Erb 1997, 17, Nos. 125-148). The object under discussion is not later to the mid-2nd century for the latest appearance of *gladius* scabbard is from a refuge cave of the Second Revolt (V.23/F.1), which corresponds well the lack of evidences to this type of edged arm in the 3rd century Dura-Europos.

2. Reeded mount of scabbard **PL. III.15A: 2**
Site:.....Binyanei Ha'uma
Expedition:.....Arubas and Goldfus (1992)
Excavation No.:...L. 6151 B. 61873/1
Material:.....Copper alloy
Dimensions –
Width:.....25mm+
Length:.....11mm
Thickness:...1-2mm

A Fragment of copper-alloy reeded mount. Parallels: Herodium (Stiebel 2003a, 223-224, Nos. 2 and 3b, Figs. 7and 8b), Masada (III.19/F.23-24), Camp F – Masada (III.20/F.4); Gamala (III.3/F.14-15). In the West: Vindonissa (Unz and Deschler-Erb 1997, 16-17, Nos. 78-110, with ample bibliography).

Q. Riding equipment

Harness pendants

1. Pendant **PL. III.15B: 1**
Site:.....Binyanei Ha'uma
Provenance:.....Legionary tiles *fabrica* – drying layer
Expedition:.....Arubas and Goldfus (1992)
Excavation No.:...L.4024; B.41255
Material:.....Copper alloy
Dimensions –
Length:.....60mm
Width:.....39mm
Thickness:.....1-2mm
Terminal:.....3x4mm
Length of loop:...16mm
Width of loop:.....7mm

Heart-shape harness pendant. The cast copper-alloy object has two lateral recesses and the typical bulbous tip. The simple loop is bent backwards. It was uncovered in a layer of yellowish viscous clay (3-5cm) – raw material, mixed with fragments of stamped tiles (Level:821.57). Like with the previous item, the stratum in which the pendant was found sealed the Jewish settlement that was destroyed during the First Revolt.

A parallel to the recess feature is reported from Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 1481, Taf. 54). Heart-shape pendants, for example: Augusta Raurica (CH) (Deschler-Erb 1999, Nos. 438-484), although differing in the loop's shape and its direction.

T. Cult utensils

1. Iron model sword? **PL. III.15A: 3**

Site:.....Binyanei Ha'uma
Expedition:.....Arubas and Goldfus (1992)
Excavation No.:...L. 4007; B. 41138
Material:.....Iron
Dimensions –
Length:.....120mm
Width of blade (max.):...10mm
Thickness of blade:.....0.5mm
Handle:.....4x4mm
Pommel:.....11x4mm

The object appears from first glance to be a razor or knife. However, it differs in shape from the reported types (*cf.* Manning 1985, 108-120). Alternatively, the object may have been used by the local craftsman in the production of pottery. Still, the great resemblance of the object to the Dacian *falx* (pommel, handle and blade) may suggest it was an *ex voto* model sword (for the Dacian sword: Lepper and Frere 1988, 272-273). Such a sword was found at Gamala (III.3/T.1).

III.16 – Wadi el-Mafjer, Cave VII/3

Map ref.: 19075 14215

Other names: 'Cave of the Sack' (Moses' Cave)[36]

PL. III.16

Geography and history

The cave is located in the northern cliff of Wadi el-Mafjer, 12m above the riverbed (**PL. III.16: 1-2**; Abeles 2002, Part 1, 134-135 (Hebrew); Part 2, 112-113). The mouth of the cave opens above the vertical face of the cliff. It was used for a prolonged period as attested by the abrasion signs on the interior of the passage's opening. The pottery is typical to the Early Roman period, seemingly from the 1st century AD. Two coins were found: Tiberius (Procurator: Valerius Gratus; AD17-24) and a Nabataean coin (AD25-106). It seems that the culture material points to the 1st century and perhaps the beginning of the 2nd century AD.

Militaria

A complete copper-alloy scale and the bottom part of another (Type 6) were found under an arranged pile of wood in the eastern sector of the anteroom (A), near the passage opening (**PL. III.16: 2**; Abeles 2002, 112).

Catalogue

B. Armour

Lorica squamata

1. A pair of copper-alloy scales **PL. III.16: 3**

Site:.....Cave VII/7
Provenance:.....Refuge cave (?)
Expedition:.....Abeles (1993)
Material:.....Copper alloy
Dimensions –
Length (scale A):.....18.5mm
Width (scale A):.....12mm
Diameter of holes (scale A):...1mm
Thickness (scale A):.....0.5mm
Length (scale B):.....9mm+
Width (scale B):.....12mm
Diameter of holes (scale B):...1mm
Thickness (scale B):.....0.5mm

The two scales were described as: 'two pieces of metal... probably scales from a soldier's armor' (Abeles 2002, 135, Fig. 8.2). Made of copper alloy, the complete and the fragmentary scales belong to the same rare type: Type 6. Identical parallel is reported from Augusta Raurica (CH) (Deschler-Erb 1999, No. 271, 147, Abb. 87 and Taf. 15). The Swiss example is

[36] Survey 1993, Cave 3.

associated with 'Auxiliarinfanterie mehrheitlich mit der der Legionärstruppen identische' (*ibid.*, 77).

III.17 – Khirbet Qumrân

Map ref.: 1935 1276

Other names: Mezad Hasidim (?)

PL.: III.17-III.17H

Reference: *TIRIP*, 210; *NEAEHL* IV, 1235-1241

Geography

The site of Kh. Qumran is situated upon a marl plateau above the northwestern shore of the Dead Sea (**PL. III.17: 1**). It is bordered from the south by Wadi Qumran and by small ravines from the west and the north. A large cemetery was surveyed and partly excavated east of the site. The site is famed by the archive of scrolls found in the nearby caves. An aqueduct fed the site's multi water-installations by the flesh floods' waters that run in Wadi Qumran.

History

The complex history of the site of Kh. Qumran is still in dispute (most recently: Magness 2002b) (**PL. III.17: 2**). In the debate concerning the nature of the site and its relation with the caves, in which the scrolls were uncovered, I place myself alongside the major group of scholars that perceive direct linkage between the site and the caves, regarding the inhabitants of which as the Essenes.

The major phase of the settlement that is of interest to us is de Vaux's Period II, which came to a violent end in the First Revolt. The site was taken over during the campaign of Vespesian's forces in the northern part of the Dead Sea in June AD68 (*BJ* 4.437-439). It appears that the legionary force that participated in this battle was manned by soldiers of the *legio X Fretensis*, which camped in Jericho that year. De Vaux dated Period III between AD68 and 73/74, the year Masada was taken. Interestingly, a legionary brick is reported from Ein-Feshkha (V.5), possibly indicating Roman military presence that controlled and ensured the safety of the perfume industry, similarly to the force that manned 'Ein Gedi (Stiebel forthcoming b). Few coins from the Second Revolt suggest temporary presence at the site, which appears to be more apparent in the near by caves of FQ37 (III.18) and GQ 19-5 (see below).

Militaria

The military equipment from Kh. Qumran still awaits publication (Donceel and Donceel-Voûte 1994, 13-14). In the last year I was granted the permission to study this assemblage by Jean-Baptiste Humbert and Alain Chambon of the École Biblique, Jerusalem, to both whom I am most grateful. A review of the finds yielded of the 194 reported metal artefacts, the following results: 1 laminated armour's tie-hoop, a fragment of shield binding, 1 *pilum* head, 1 spearhead, 6 iron trilobate arrowheads, 1 *catapult* bolt a *sica*, two belt mounts and a frog.

We may further note equine equipment such as a girth hoop and a *phalera*. *Caliga* nails were gathered along the pass leading from the site northward, while a single light javelin head is reported from Cave GQ 19-5.

Most of the military fittings that were uncovered in the site derive from Period II. Of the over all 21 artefacts, 15 date to this level, while 3 more may origin from Periods III or II. An analysis of the military equipment's spatial distribution within the site clearly points out the main structure as the major place of origin for the *militaria*. The fact the tower and its nearby rooms – mainly L.30 were targeted, illustrates the defensive function they have naturally fulfilled during times of conflict.

As detailed below, the finds comprise some military fittings typical of legionary panoply. This attribution is further strengthened, in light of the discovery of a *catapult* bolt. The latter indicates the participation of light artillery machines, which were operated by the legions, in the conquest of the site in AD68.

Catalogue

* Please note that the material from Kh. Qumran hereby presented, by the kind permission of the École biblique et archeologique francaise de Jérusalem, was not published. Hence, it may not be used or reproduced elsewhere!

** All the drawings, but KhQ 294 (below G.3), were made by Alain Chambon.

A. Helmets

1. Handle? **PL. III.17A: 1**

Site:.....Kh. Qumran
Expedition:.....de Vaux
Excavation no.:...Trench W; KhQ 614
Material:.....Iron
Dimensions –
49x59mm

A possible helmet handle (for the identification problems: Vol. I, pp. 30-31). The iron object has a circular cross-section and simple tapering terminals. It was uncovered in Trench W (tranchée Ouest).

B. Armour

1. Tie-hoop **PL. III.17A: 2**

Site:.....Kh. Qumran
Provenance:.....Tower
Expedition:.....de Vaux
Excavation no.:...L. 10; KhQ 349
Material:.....Copper-alloy

Dimensions –
Length:.....40mm+
Width:.....22mm
Height:.....22mm
Thickness:.....2mm
Diameter of hole:...2mm

A fragmented large tie-hoop of '*lorica segmentata*' armour. The loop has an extended terminal, which is aligned with the tie-hoop's body. The fragmented body still exhibits one attachment hole. The object was uncovered in the upper level of L. 10, the north-east room of the Tower (Humbert and Chambon 1994, 295-296, Fig. VII). It presumably originated in Period III (68-73/74AD). This fitting belongs to a type of armour that is commonly associated with the legionary forces (see also: Masada (III.19/2-4) and Samaria (I.6/B.1)). It provides further example for the presence of citizen soldiers at the site (see above, H.1 and M.1). If indeed the fitting derives from the period of the garrison that manned the site following the conquest of the site to AD73/74. Such large examples are known from Gamala (III.3/B.14-15), and see also an example from Samaria (I.6/B.1).

D. Military dress and footwear

Caliga hobnails

1. Group of 60 *caliga* hobnails **PL. III.17A: 3**

Some 60 iron hobnails were uncovered along a pass that led between the site and the caves to its north (Eshel and Broshi 1997; Bordowicz 2001, 39-42). No finds, latter of the Second Temple Period, were detected along the pass. The excavators assumed that the nails dropt from both military and civilian sandals. The examined 53 hobnails comprise four types: 'Small, with flat head', 'small simple', 'mushroom', 'mushroom with flat head' (*ibid.*, 39-42, Figs. 13-16 – respectively).

E. Shield

1. Fragmented shield binding **PL. III.17A: 4**
Site:.....Kh. Qumran
Provenance:.....Passage
Expedition:.....de Vaux (1955)
Excavation no.:...L. 99; KhQ 2498
Material:.....Copper-alloy
Dimensions –
Length:.....76mm+
Width:.....23mm
Thickness of U-binding:....12mm
Length of bent rivet:.....29mm
Diameter of rivet:.....9-11mm

A fragment of a copper-alloy shield's binding. The slightly carved object still retains one of the attachment flat-head rivets. In Palestine, parallels are known from Masada (III.19/E.8-9). The fragment was uncovered in a passage (L. 99) and appears to belong to Period Ib, with the *terminus post quem* of 31BC (Humbert and Chambon 1994, 322, Fig. XVIII). It therefore seemingly presents a shield fitting from the reign of Herod the Great. For the shield motif on Herod's coins and a possibly Herodian sculpted evidence from Sūr (Sahr) (SY) (Butler 1907, 445, ill. 387, Fragment L), see: Vol. I, 74.

F. Edged weapons

Daggers

1. *Sica* **PL. III.17B: 1 – III.17C: 1-2, 2a**

Site:.....Kh. Qumran
Provenance:.....'Scriptorium'
Expedition:.....de Vaux (1953)
Excavation no.:...L. 30; KhQ 452
Material:.....Iron
Dimensions –
Length:.....215mm
Width of blade:.....35mm
Thickness of blade :...5mm
Thickness of tang:.....3mm

A markedly curved, nearly angled, iron blade of a *sica* was uncovered in the centre of L. 30 (milieu) 'sur le sol'. It has a short tapering tang. This type of edged weapon is commonly found in gladiatorial representations. A close sculpted parallel is depicted on a tombstone from the 2nd century AD, in the Musée du Louvre (FR) (**PL. III.17C: 2 and 2a**). This curved edged weapons further depicted being held by a *thraex* (Junkelmann 2000a, Fig. 42; Junkelmann 2000d, Figs. 93, 110, 128, 182, 183 - left) and as part of gladiatorial equipment on a 1st century AD lamp in the BM (Junkelmann 2000a, Fig. 20; Junkelmann 2000d, Fig. 58). Additional example, though with a less curved blade was uncovered in Cave 2, Nahal David (I.8/F.1). For the *sica* in the Roman world and particularly in Judaea, see: Vol. I, pp. 113-114.

The *sica* from Kh. Qumran appears to date from the end of Period II (AD68). This room further yielded an iron spearhead (H.4), a *catapult* bolt (M.1) and a girth buckle (Q.1).

G. Belts

A pair of belt plates, apparently from the same set, was uncovered at Kh. Qumran in the tower – Loci 9 and 9a.

1. Hinge belt plate **PL. III.17C: 3**

Site:.....Kh. Qumran

Provenance:.....Tower
Expedition:.....de Vaux (1953)
Excavation no.:...L. 9; KhQ 554
Material:.....Copper-alloy
Dimensions –
Length:...45mm
Width:....25mm

A copper-alloy hinge plate. The hinge consists of three loops and is defined by two parallel grooves. Its other three edges have shallow recessed perimeter. Four attachment short rivets are visible on the back of the plate. A hinges belt plate was uncovered at Masada (III.19/G.1). *Cf.* Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 41, No. 1067).

The plate was found in Locus 9A, the north-west room of the tower (Humbert and Chambon 1994, 295, Fig. VII, Photo 17). The latest coin in locus 9A inférieur was Procurators under Tiberius (KhQ 593). It may be carefully suggested that the balteus set dates from the Early 1st century AD. See next item.

2. Belt plate **PL. III.17C: 4**
Site:.....Kh. Qumran
Provenance:..... Tower
Expedition:.....de Vaux (1953)
Excavation no.:...L. 9A; KhQ 558
Material:.....Copper-alloy
Dimensions –
Length:.....67mm
Width:.....39mm
Length of rivets:.....5mm
Diameter of rivets' heads:...4mm

A copper-alloy rectangular belt mount. Short four attachment rivets are discernable on the plate's back. Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 42-43, Nos. 1081-1137 – with ample bibliography). In all likelihood, it was part of the same set of belt plates as the pervious item. For context, see previous item.

3. Frog **PL. III.17C: 5**
Site:.....Kh. Qumran
Provenance:.....Small room
Expedition:.....de Vaux (1953)
Excavation no.:...L. 15; KhQ 294
Material:.....Copper-alloy
Dimensions –
Length:.....26mm
Diameter of shank:...11mm
Diameter of head:.....36mm

A, now lost, copper-alloy frog with a looped shank was found at L. 15 – a small room in the south-west sector of the main structure that was built in Period III (AD68-73/74), above the

'scriptorium' – L. 30 (Humbert and Chambon 1994, 298, Fig. XI, Photo 108).[37] This date accords well the known paralleling examples from Gamala (III.3/G.6), Masada (III.19/G.13), and siege Camp F, Masada (III.20b/G.1) (see: Vol. I, pp. 127-129).

H. Shafted weapons

1. *Pilum* head **PL. III.16E: 1**

Site:.....Kh. Qumran
Provenance:.....Elongated room
Expedition:.....de Vaux (1951)
Excavation no.:...L. 6; KhQ 135
Material:.....Iron
Dimensions –
Length:.....246mm+
Length of head:.....42mm
Head:.....13x13mm
Diameter of shaft:...11-15mm

An iron *pilum* head is reported from the site. A head with rhomboid cross-section crowns a long circular shaft. This find is of a particular interest being a *fossil director* of the legionary panoply. It was uncovered in locus 6, angle N-W, sur le sol inférieur' (Humbert and Chambon 1994, 293-294, Fig. IX). It was uncovered in an elongated room of the Northeast unit of the main structure, east of the Tower. The context appears to be Period II, with the *terminus post quem* of AD68.

2. Light javelin head **PL. III.16F: 1**

Site:.....Kh. Qumran
Provenance:.....Cave
Expedition:.....de Vaux
Excavation no.:...GQ 19-5
Material:.....Iron
Dimensions –
Length:.....166mm
Length of blade:.....100mm
Thickness of blade:...6mm
Width:.....40mm
Thickness of tang:.....8mm

A collared leaf shaped javelin head with faceted blade. The tapering tang exhibits a rhomboid cross-section. The head was found in Cave 19 – 5 some 1km north of Kh. Qumran (Fig. XXXI). Parallels are reported from the Second Revolt contexts, most notably a head from the Murabba'ât caves (V.16/H.1 – *cf.* VI.8/H.2). These examples indicate that the caves were in use during the Second Revolt.

3. Spearhead? **PL. III.16F: 2**

Site:.....Kh. Qumran

[37] The latest coin dates to the Procurators under Nero.

Provenance:.....Cell in courtyard
Expedition:.....de Vaux (1955)
Excavation no.:...L. 141; KhQ 2443
Material:.....Iron
Dimensions –
Length (bent):.....170mm+
Length (estimated):...240mm
Width:.....24mm

Long iron projectile, with circular cross-section. The item was uncovered in L. 141, a small cell in the southeastern sector of the large open courtyard in the northwest part of the site from Periods Ib-II (Humbert and Chambon 1994, 337, Figs. XIX-XX, Photos: 247-248, 251).

4. Spearhead **PL. III.16F: 3**
Site:.....Kh. Qumran
Provenance:.....'Scriptorium'
Expedition:.....de Vaux (1953)
Excavation no.:...L. 30; KhQ 433
Material:.....Iron
Dimensions –
Length:.....104mm+ (137)
Width:.....45mm+ (50)
Width (estimated):.....50mm (65)
Thickness:.....10mm
Diameter of socket:.....20mm
Thickness of socket:...6mm

Much corroded, iron socketed leaf-shaped spearhead. Most of the socket and the perimeter of the blade are missing. The head was unearthed in the centre of L. 30 – the 'scriptorium' – seemingly dating to the end of Period II (AD68). A *sica* (F.1), a *catapult* bolt (M.1) and a girth buckle (Q.1) were further uncovered in this locus.

Ferrules

4. Spear butt **PL. III.16D: 1**
Site:.....Kh. Qumran
Provenance:.....Unknown
Expedition:.....de Vaux
Excavation no.:...KhQ 3655
Material:.....Iron
Dimensions –
Length:.....120mm
Diameter:.....47mm
Thickness:...6mm

Iron conical ferrule. Unknown provenance.

5. Spear butt? **PL. III.16D: 2**
Site:.....Kh. Qumran
Provenance:.....Sounding, north of the site
Expedition:.....de Vaux (1953)
Excavation no.:...Tranchée A; KhQ 332
Material:.....Iron

Dimensions –
Length:.....85mm+
Diameter:.....34mm
Thickness:...5mm

A possible ferrule, the dorsal and proximal edges are damaged. It was unearthed in 'Tranchée A, Couche 6', a sounding conducted north of the site (Humbert and Chambon 1994, 339-340, Fig. II). Three of four coins were that of Alexander Jannaeus, while one is Seleucid (222-187BC).

I. Archery equipment

The discovery of iron arrowheads is noted by the excavator: 'Iron arrow-heads have been recovered, and almost everywhere a layer of a powdery black substance gives evidence of the burning of the roofs' (de Vaux 1973, 36; also de Vaux 1954, 213). The find of the arrows was attributed to the Roman soldiers alone:

> 'The destruction of Khirbet Qumran will therefore have been at the hand of Roman soldiers, whose arrow-heads have been found there as well as certain of the coins which they had received in their pay, the coins of Caesarea (and of Dora nearby), where they were stationed in the course of the year A.D. 67/68.' (*ibid.*)

Another reference to arrowheads from Qumran was made in 1994, noting that the metal ware included 'small three edged 'arrowheads'...' (Donceel and Donceel-Voûte 1994, 13).
My preliminary examination of the metal ware indicates the presence of six iron trilobate tanged arrowheads (III.17/I.1-6). Most of the arrowheads were uncovered in the central structure, in Period II context, indicating that the enemy's main effort was targeting this sector.
The trilobate type is typical of both the First and Second Revolts' contexts: Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91). Refuge caves of the Judaean Desert – the Cave of Letters (V.24/I.1-3) in Nahal Hever, the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b), the Cave of the Pool in Nahal David (V.20/I; Avigad 1962, 183, Pl. 18c), Har-Yishai Cave (Stiebel 2004b), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

1. Trilobate arrowhead **PL. III.17G: 1**
Site:.....Kh. Qumran
Provenance:.....Northeast unit

Expedition:.....de Vaux (1953)
Excavation no.:...L. 19; KhQ 324
Material:.....Iron
Dimensions –
Length:.....35mm+
Length of tang:...2mm
Width:.....15mm

Trilobate arrowhead, with rounded wings (sub-type E). One of the wings is damaged. It was found in 'L.19 supérieur'. The northwest room of the northeast unit of the main structure, east of the tower. The arrowhead belongs either to Period II, or III. The latest coin is from the Procurator under Nero (Humbert and Chambon 1994, 299, Fig. IX, Photo 44).

2. Trilobate arrowhead **PL. III.17G: 2**
Site:.....Kh. Qumran
Provenance:.....Potter workshop
Expedition:.....de Vaux (1953)
Excavation no.:...L. 45c; KhQ 833
Material:.....Iron
Dimensions –
Length:...33mm+
Width:....14mm

Trilobate arrowhead damaged wings and tang. It was uncovered in L. 45c – Period II, a small room in Potter workshop's wing at the southeast part of the site (Humbert and Chambon 1994, 307-308, Fig. XXVI).

3. Trilobate arrowhead **PL. III.17G: 3**
Site:.....Kh. Qumran
Provenance:.....Room with benches
Expedition:.....de Vaux (1953)
Excavation no.:...L. 4; KhQ 297
Material:.....Iron
Dimensions –
Length:.....28mm+
Length of tang:... 1mm
Width:.....12mm

Trilobate arrowhead, tip and most of the tang are missing. The wings are rounded (sub-type E). It was unearthed on the floor of the east part of L. 4, a room in the southwest unit of the main structure. Lower benches encircle the four walls of the room (Humbert and Chambon 1994, 293, Fig. XI, Photo 133). Additional arrowhead was uncovered in this locus (see next item). Both heads appear to date to Period II.

4. Trilobate arrowhead **PL. III.17G: 4**
Site:.....Kh. Qumran
Provenance:.....Room with benches
Expedition:.....de Vaux (1953)
Excavation no.:...L. 4; KhQ 302
Material:.....Iron

Dimensions –
Length:.....40mm+
Length of head:...32mm
Width:.....12mm

Trilobate arrowhead, with tapering wings (sub-type B). The tang is broken and bent due to impact. One of the wings is damaged. It was uncovered in L. 4, Period II. Lower benches encircle the four walls of the room (Humbert and Chambon 1994, 293, Fig. XI, Photo 133). Additional trilobate head was uncovered in the east part of the room (see previous item).

5. Trilobate arrowhead **PL. III.17G: 5**
Site:.....Kh. Qumran
Provenance:.....Small room
Expedition:.....de Vaux (1953)
Excavation no.:...L. 33; KhQ 592
Material:.....Iron
Dimensions –
Length:.....41mm+
Length of head:...30mm
Width:.....12mm

Trilobate arrowhead, with straight wings (sub-type A). The tang is broken and bent due to impact. It was uncovered in 'L. 33 supérieur', a small chamber built in Period II in the centre of the central unit of the main structure (Humbert and Chambon 1994, 303, Fig. X, Photo 63). The fact it was found in the upper level of the locus presumably attributes the arrowhead to Period III.

6. Trilobate arrowhead **PL. III.17G: 6**
Site:.....Kh. Qumran
Provenance:.....Chamber
Expedition:.....de Vaux (1956)
Excavation no.:...L. 41; KhQ 715
Material:.....Iron
Dimensions –
Length:.....35mm+
Length of head:...31mm+
Width:.....13mm

Trilobate arrowhead, with rounded wings (sub-type E). The tang is broken as is its tip. It was uncovered 'L. 41 supérieur', dating from either Period II or III (Humbert and Chambon 1994, 306, Fig. IX, Photos 38-40).

M. Torsion artillery

Catapult bolts

1. Socketed *catapult* bolt **PL. III.16G: 7**
Site:.....Kh. Qumran
Provenance:.....'Scriptorium'
Expedition:.....de Vaux (1953)

Excavation no.:...L. 30; KhQ 462
Material:.....Iron
Dimensions –
Length:.....160mm+
Length of head:.....74mm
Head:.....26-30mm
Diameter of shaft:...28mm

A single iron socketed *catapult* bolt. The head of the bolt is square in cross-section with rounded tip. The proximal end of the socket is damaged. It was found 'près du sol' of the south part of L. 30, an elongated room known as the 'scriptorium' (Humbert and Chambon 1994, 302-303, Fig. XI, Photo 112). It appears to belong to the destruction of Period II, as a result of the Roman conquest of AD68. This find reflects the employment of light artillery machinery during the site's conquest.[38] The fact such machinery was operated by the legions serves as an additional indication for the participation of citizen soldiers in the assault. The Roman operated artillery in the conquest of small settlements: Meroth (III.1/M.1) and Kh. Ziphiyon (V.8/M.1), as well as refuge caves: Cave of the Pool (V.20/M.1) and the el-Jay (V.13/M.1).

Q. Riding equipment

1. Girth buckle **PL. III.17H: 1**
Site:.....Kh. Qumran
Provenance:.....'Scriptorium'
Expedition:.....de Vaux (1953)
Excavation no.:...L. 30; KhQ 434
Material:.....Iron
Dimensions –
66x58mm
Thickness:...4-10mm

A large D-shaped girth buckle. The loop is circular in cross-section, the tip of the tongue is corroded near the centre of which. A close parallel is reported from 'Ein Rachel (IV.6/Q.1), Bishop 1988, 105; Hyland 1993, 49-50. The item was uncovered in 'L. 30 milieu, sur le sol'. Dated to the end of Period II (AD68), it was found alongside a *Sica* (F.1), an iron spearhead (H.4) and a *catapult* bolt (M.1).

2. *Phalera* **PL. III.17H: 2**
Site:.....Kh. Qumran
Provenance:.....Chamber
Expedition:.....de Vaux (1953)
Excavation no.:...L. 39; No. 738
Material:.....Copper-alloy
Dimensions –
Diameter:...72mm
Height:.....14mm

[38] For the use of bolts: Section II M.2.2.1.

Circular copper-alloy *phalera* with bossed centre. The boss is encircled by two grooved concentric circles, while three grooves decorates the perimeter of the *phalera*. It was found in the lower part of L. 39, (Humbert and Chambon 1994, 305, Fig. IX). The object appears to date to Period II, the latest coin there uncovered is that of Herod Archelaus. In the nearby Rooms, Loci 19 and 41, two iron trilobate arrowheads were uncovered.

U. Tents

Pegs

1. Iron peg **PL. III.17H: 3**
Site:.....Kh. Qumran
Expedition:...Eshel and Broshi 1997
Material:.....Iron
Dimensions –
Length:.....120mm
Width:.....67mm
Thickness:...3mm

Iron peg, the lower part of which is bent. Discovered in the marls north of Qumran, it was reported as a 'tent peg' (Eshel and Broshi 1997, 132; Broshi and Eshel 1999, 336, Fig. 3.3).[39] According to Josephus the Esseans used to dug: 'a trench a foot deep with a σκαλίς – such is the nature of the hatchet which they present to the neophytes – and wrapping their mantle above them, that they may not offend the rays of the deity, sit above it. They then replace the excavated soil in the trench. For this purpose they select the more retired spots' (*BJ* 2.148-149). See also Deut. 23.12-14.

[39] It should be noted that five wooden poles of tents are reported from Cave 17 near Qumran (*DJD* III, 16-17, Pl. VII.3). For a possible tents encampment north of Kh. Qumran, see: Broshi and Eshel 1999, 336, 338-339

III.18 – Cave FQ37

Map ref.: 1935 1263

Geography and history

PL. III.18

The cave is located *c.* 1 km south to Kh. Qumran, high in the cliff. Explored in January 1989, the excavators identify it with cave 37 of the 1952 survey expedition (**PL. III.18: 1**; Patrich 1994, 91-93, Fig. 1). They suggested that the cave was used by one member of the Qumran's sect living in seclusion, and during hazardous days it presumably served as a shelter (*ibid.*, 92).

In front of the cave's opening a terrace was excavated, where a Roman coin, an iron nail and a variety of glass and pottery fragments were found. Patrich noted that 'the corpus as a whole belongs to the last years of the Second Temple Period' (*ibid.*). However, as he himself further asserted, the coin dates from the 1st and the 2nd centuries AD and some of the pottery types 'can be post-70 C.E.' (*ibid.*). Since the iron javelin head appears to be typical of the Second Revolt we may carefully suggest that the cave been have also inhabited by Bar-Kokhba's rebels, the presence of which is attested in the nearby site of Qumran.

Militaria

A rare find of a complete reed *stele* was uncovered in the cave. This main-shaft, which was found to date in the Judaean Desert incomplete, enables us to accurately reconstruct the length of the arrow. Two iron arrowheads and a light javelin head are further reported.

Catalogue

H. Shafted weapons

Light javelin head

1. Tanged iron javelin head **PL. III.18: 2**

Site.....Cave FQ37
Provenance:.....Terrace in front of the cave's opening
Expedition:.....Patrich and Arubas 1989
Excavation No.:...Unknown
Dimensions –
Length.....50mm+
Maximum width:...13mm
Length of tang:.....30mm
Length of collar:...15mm

The fragmentary tanged iron flat section head was originated in the terrace in front of Cave FQ37 – *c.* 1 km south to Kh. Qumran. Only the collared tang and the lower part of the blade with slightly tapering edges towards the tang have preserved. Published as a 'leaf shaped arrowhead' (Patrich 1994, 92, Fig. 16), this low-shouldered fragmentary head is too large and heavy to be an arrowhead. Its size and shape clearly identifies it as a light javelin head (Type

VII). Similar heads are known from Second Revolt refuge caves: the Large Caves Complex (V.15/H.1), Wadi Murabba'ât (V.16/H.4) and the Sela' Cave (V.27/H.1).

I. Archery

Arrowshafts

1. Arrow stele **PL. III.18: 4**
Site.....Cave FQ37
Provenance:.....Terrace in front of the cave's opening
Excavation No.:...Unknown
Dimensions –
Length.....762mm (30 inches)

The photograph of a painted arrow stele is included in an article that was dedicated to surveys conducted in the Judaean Desert Caves (Patrich 1998). Beside its length no further details concerning this find are provided. The reed stele is painted red (cresting: Stiebel 2004b, 123ff, Pl. 3). The part presented in the photograph is its proximal end, in which one may observe the notch and the glue marks of the fletching. The complete stele is 762mm long. This measure allows us to reconstruct the full length of the arrowshaft: *c.* 850-900mm (*cf.* James 1990, 87).

Arrowheads

Iron arrowheads

2. Iron trilobate arrowhead **PL. III.18: 3**
Site.....Cave FQ37
Provenance:.....Terrace in front of the cave's opening
Excavation No.:...Unknown
Dimensions –
Length.....25mm
Maximum width:...8mm
Length of tang.....11mm

A small trilobate iron arrowhead was found in the terrace. Its vanes are much drawn back – strongly barbed (Type D). This rather rare design tends to be very small in dimension.

Parallels: Cave of Letters (V.31/I.1) and in Herodium (Stiebel 2003a, Nos. 70, 97, 119, 122, 128). Additional head was uncovered in the Murabba'ât Caves (V.16/I.1).

3. Iron bodkin arrowhead **PL. III.18: 5**
Site.....Cave FQ37
Excavation No.:...Unknown

A bodkin iron arrowhead was found in the cave. It has a relatively stout tang. Parallels from the First Revolt were reported from: Meroth (III.1/I.1-7); Gamala (III.3/I); Magdala (III.4/I.1); the Site of the Caves (III.5/I.1-35). From Second Revolt context: Sandal Cave (V.14/I.1); the Spear Caves (V.17/I.1).

III.19 – Masada

Map ref.: 1837 0804

Other names: es-Sebbe, Mezada, Massada

PL. III.19-III.19AB

References: *TIRIP*, 180; *NEAEHL* III, 973-985

Geography

The mount of Masada is situated in the eastern outskirts of the Judaean Desert, near the west shore of the Dead Sea. It is a geological horst which rose and detached from the cliff. It is bordered from the west by Nahal Ben-Ya'ir and from the south and east by Nahal Masada (Wadi e-Sabbah). The mountain's top is a plateau, *c.* 650m long and *c.* 300m wide. It raises 450m above the level of the Dead Sea (elevation: *c.* +60m). The marl plateau (*havar* formation), which is the product of the ancient Lisan Sea, east and north of the site, is furrowed by numerous ravines.

Masada is located near two ancient roads: one that crossed the Judaean Desert and led to Moab and a second that connected between Edom, Moab and the Arabah to 'Ein Gedi and Jerusalem. The natural fortification and its distance from the settled land made Masada a superb location for a fort. The only disadvantage of lack of flowing water in the immediate vicinity was over came during Herod's rein in the construction of several water cisterns on top of the mountain, in addition to a system of dams and two aqueducts that fed flesh folds' waters into 12 cisterns, with the capacity of some 40000 m^2. The climate is very arid, which contributed to the excellent preservation of the culture material including objects made of organic materials.

History

According to Josephus, Masada was first fortified by 'Jonathan the High Priest', which was identified with Alexander Jannaeus (103-76BC), whose coins were uncovered at the site. Some scholars tend to identify the founder with Jonathan, the brother of Judaeus Maccabaeus that was nominated as High Priest in 152BC. No clear archaeological remains from the Hasmonaean period were yet uncovered at Masada.

King Herod that ruled between 37-4BC, learned about the potential of the site during the very early stages of his fight over the crown. In 40BC his family that found shelter at Masada came under siege of his opponent, Mattathias Antigonus. Following his raise to power Masada became an important placial fort. In addition to its leisure merits, the site was intended to be used as a refuge place against both internal and external threats. Alongside the lavish palaces and bathing installations, the fortified site was equipped with large storerooms, well stocked with weapons, raw materials and foodstuffs.

Following the removal of Herod Archelaus from the throne and the annexation of Judaea into the Roman Empire (AD6), Masada was garrisoned by a small Roman unit. One of the first clashes to take place during the eruption of the First Revolt was the conquest of Masada by a group of Sicarii, under the command of Menahem son of Yahuda (AD66). The composition of the rebel community at Masada was varied and dynamic throughout the years of the revolt. In addition to the dominant group of the Sicarii, we learn about the presence of Simon son of Gioras as well as members of the Essenes and Samaritans. The rebels used the casemate wall and part of the Herodian small palaces and storerooms for dwellings. They have constructed religious structures and installations. A wealth of culture material and epigraphic finds was uncovered from that period.

According to Josephus, Masada was the last rebellious stronghold in Judaea. In AD73/74, the Romans, under the command of Silva Flavius, laid siege on the site. The besieging force, comprised of *legio X Fretensis* and auxiliary units, which were deployed in eight temporary camps around the site. The Roman assault efforts concentrated at the west sector of Masada, which topographically was more accessible. A siege ramp was erected upon a natural spur allowed the Romans to draw a tower and a battering ram near to wall. The excavations of the Roman breach revealed numerous projectiles and missiles. According to Josephus the rebels constructed in advance a barricade in the image of a wooden and soil wall. The latter was set on fire by torches that were hurled by the Romans. The collapse of this wall determined the end of the battle, for according to Josephus the rebels decided during the following night to commit suicide.

The Romans left a small garrison that seemingly stationed on the mountain for several months, in order to clear the mountain. A small camp (F_2) was erected in the north-west quarter of Camp F. According to Yadin it was manned until the early years of the 2nd century AD (*terminus post quem*: AD111), when the camp was abandoned following the establishment of Provincia Arabia (AD106) (see below III.20).

Militaria

A wealth of military fittings was uncovered at the site. The finds, produced from a wide range of raw materials including rare organic remains, represent most of the categories of protective and offensive equipment. We were able to identify weapons from most of the military phases of the site. The study of the spatial distribution of the fittings, such as the *ballista* balls (Vol. I, p. 167ff), shed new light upon the position of the forces and the course of battle.

Several artefacts were subject to scientific analyse which advanced our knowledge concerning the production of weapons. Worthy of noting is the archaeometallurgical study of Ponting and

Segal (Ponting and Segal 1998; Ponting 2002a) and the DNA data extracted from bone and leather military fittings (Kahila Bar-Gal 2000, 63-64; Appendix 1.1).

Catalogue

* The format of the following section differs slightly from that used in the rest of the dissertation, for it was extracted from the forthcoming publication of the *Masada Final Reports* series.

A. Helmets

1. Cheekpiece of cavalry helmet **PL. III.19A: 1**

Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Tower room (rebels)
Excavation No.:.....L.1118; B.1912/2
Material:.....Copper alloy
Dimensions –
Length:.....75mm+
Width:.....53.5mm
Thickness:.....0.5mm
Weight:.....7.41gr

This copper-alloy fragment from a tower room in the eastern section of the casemate wall represents the upper part of a cheek defender (*Masada* III, 548, Plan 55). The fragment clearly belongs to Robinson's Cavalry Sports I, or Type Weiler-Guisborough (Robinson 1975, 133-135; Feugère 1994, 104-117). These highly decorated helmets were used by the cavalry from the first to third centuries AD. Complete examples indicate that the cheekpieces were designed to protect the lateral face and the ears. Embossed ears are thus very popular, though a few examples lack this feature. Although supposedly used in combat, the splendour of these helmets and the flimsiness of their cheekpieces suggest that they functioned more as parade helmets in events such as the *Hippika Gymnasia* (For a hypothetical table of the evolution of the cavalry helmet *cf.* Feugère 1994, 110; on the *Hippika Gymnasia cf.* Hyland 1993). The parallels to the cheek defenders indicate that the Masada fragment represents the upper part of a left cheekpiece, as attested by the pattern of the cabled border. The raised cable line that encircles the perimeter of the plate is a characteristic feature of this type. As the complete examples show, the main motif that decorated the object (missing on the Masada piece), which was usually mythological in nature, was placed within the bordered space. A shell, palmette, or solar design, the outline of which is framed by the cabled border, is embossed in the centre of the Masada fragment (the upper part of the complete plate). This pattern was very popular on this type of helmet. It occurs on cheekpieces from Gloucester (Robinson 1975, Fig. 406), Brough, Nottinghamshire (*ibid.*, Fig. 401), Yredoorn (*ibid.*, Fig. 399), river Waal (*ibid.*, Fig. 269), Leicester (Feugère 1994, 106), Wels (Feugère 1994, 114),

Theilenhofen (*ibid.*, 115) and Sarmizegetusa Regia (Petculescu 1990, 843-844, Fig. 2). A variation of this design decorates a helmet from Frankfurt-Heddernheim (*ibid.*, 117), in the shape of a half-rosette. This element appears to be represented on other cheekpieces from Theilenhofen (Robinson 1975, 286), Gerulata (Krekovic 1994, 211; Fig. 1), and Regensburg (Garbsch 1978, 76 (O_{78}), Pl. 33: 3), where it has become an integral part of the border.

A floral pattern flanked both sides of the shell design, only the left of which has survived. Few remains of the main design are preserved, which are too scant to offer any clue as to the complete image. The upper and left margins indicate that the edges were folded backwards to hold the original backing. Such folds are a common feature on helmets of this type, apparently due to the thinness of the metal (*ibid.*, Figs. 399-404; Bennett 1985, 110). The copper-alloy piece, which has a golden face, was subjected to strong chemical treatment in the 1960's. As a result, any additional features that might have been present, such as tinning have long disappeared (Tinning was observed on the Stanwix cheekpiece (Bennett 1985, 110)). The artesian used a combination of techniques including punching and incision to create the decorative motifs.

Cheekpieces of this type are recorded from the northern and eastern *limes* (Abdul-Hak 1954-5, Pl. VII; Robinson 1975, 133). Most are dated to the 2nd and 3rd centuries AD, although at least one cheekpiece originated in a context of the second half of the 1st century AD (a cheekpiece from Gloucester; *cf. ibid.*, Fig. 406). The Masada piece points to the relatively early appearance of this type.[40]

A socketed spearheads was further found in this locus (III.19/H.1).

2. Cheekpiece (not illustrated)
Site:.....Masada
Expedition:.....Netzer and Stiebel (1996)
Provenance:.....Rebel dwellings
Excavation No.:...N7.15; B.115
Material:.....Copper alloy

The storeroom that was inhabited by rebels revealed a large number of copper-alloy finds, among which a fragmentary cheekpiece, currently undergoing a conservation and reconstruction process which will hopefully allow us to determine its type.

3. Crest support **PL. III.19A: 2**
Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Rebel room (Building IX)
Excavation No.:...310-250
Material:.....Copper alloy
Dimensions –

[40] A 1st to 2nd century AD date has now been suggested for the Stanwix cheekpiece, instead of the previously proposed 3rd century AD date.

Length:.....41.5mm
Width:.....34mm
Maximum height of ridges:...3mm

This is a crest support of the Imperial-Gallic or Weisenau type of helmet (Feugère 1994, 86-97). The copper-alloy rectangular plate has two raised parallel ridges, which were intended to hold a double-tongued slide-in crest support.[41] Support holders of this kind were generally riveted to the helmets (Robinson 1975, Figs. 62-63, Pls. 110, 116, 119, 125-126). However, a support holder from Rheingönheim (DE), like the object under discussion, exhibits no traces of such holes. The absence of holes for attachment suggests that these pieces were originally soldered to the helmet crown. In fact, some patches of the soldering agent are visible on the rear face of the Masada piece. Though many crest supports holders were riveted to the helmet, the usage of soldering is well-attested. For example, the bronze helmet of L. Lucretius Celeris of the *legio I Adiutrix* has soldering remains on its crown. The fact that holes for attachment are not visible led Robinson to suggest that a slide-on crest holder was fastened to the helmet by means of soldering (*ibid.*, 46, 58; Pl. 140). It is worth noting that the deposition of this helmet was dated by Klumbach to 71-83 AD (*ibid.*, 58; crest holders, though of a different type, were similarly soldered to the crowns of the Imperial-Italic type (*ibid.*, Pls. 151, 156, 158)).

An examination of the ridges of the crest support holder from Masada reveals that one end is 3mm high and the other is almost flat. This appears to reflect the original position of the object, with the opened end designed to accept the slide-in support. This object comes from a unit of two small rooms west of Building IX dating to the time of the revolt (*Masada* III, 228-229, Pl. 15). Interestingly, three more military finds were discovered in the immediate vicinity (see below, IN 311-407/1, 360-645 and 324-57/2).

4. Helmet fastening loop (?) **PL. III.19A: 3**
Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Rebel occupation, adjacent to the casemate wall
Excavation No.:...1273-1748/3
Material:.....Copper alloy
Dimensions –
Length:.....27mm
Diameter of loop (external):...15mm
Thickness of loop:.....2.5mm
Length of plate:.....16mm
Width of plate:.....9mm
Thickness of plate:.....0.5mm
Diameter of pin's head:.....8mm

[41] For a reconstruction of crested helmets *cf.* Robinson 1975, Pls. 129, 134-135; for representational evidence *cf. ibid.*, Figs. 150-157; Peterson 1992, 29.

The copper-alloy ring is held by a rectangular plate. The plate is folded in two around the ring, with its halves secured by a circular head pin. Similar objects functioned as cheekpiece fastening devices, as demonstrated by numerous helmets (mainly Robinson's Imperial-Gallic and Imperial-Italic types). A pair of loops from Vindonissa (CH) was recently published under this category, while two more loops attached to fragmented cheekpieces come from that site (Unz and Deschler-Erb 1997, Nos. 584-585; for attached loops *cf.* Nos. 571-572). However, such loops also occur on the inner side of the neck guards of helmets as well as above the neck guard and the forehead, as crest fasteners on Imperial-Gallic helmets (For early examples: Feugère 1994, 70-71; for early Roman occurrences: Robinson 1975, Figs. 28, 37; Pls. 118-119, 134-135, 194, 209, 217, 225, 230; Feugère 1994, 83, 86). In addition, similar loops were placed along the edges of greaves.[42] The Masada piece comes from an area in front of tower room L1264 in the western casemate wall (*Masada* III, 450, Plans 17, 41), which also yielded a bone handguard (see below IN1273-1787/1). Another loop was unearthed in L531 (see below IN 531-247).

The multiple uses of these objects, as detailed above – and these are the military ones alone – means that their identification as helmet fastening loops is problematic.

5. Helmet fastening loop (?) **PL. III.19A: 4**

Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Corridor, Western Palace
Excavation number:...531-247
Material:.....Copper-alloy
Dimensions –
Length:.....29mm
Diameter of loop (external):...17mm
Thickness of loop:.....2.5mm
Length of plate:.....16mm
Width of plate:.....9mm
Thickness of plate:.....0.5-1mm
Diameter of pin hole:.....2.5mm

This is very similar to the previous object. The plate's edges are slightly chipped, and the fastening pin is now lost. It was found in a corridor in the western palace adjacent to room L443, at the entrance to which a large assemblage of copper-alloy objects was uncovered (*Masada* III, 284-285, Plans 17-18; for Room 443, see: p. 285). The later produced a fragmentary bone handgrip of a sword (see below IN 443-152/2; III.19/F.6).

[42] For greaves *cf.* Robinson 1975, Pls. VIII, 506-507, 523, 527; Garbsch 1978, Abb. 5 and Nos. Q5, Q15.

Helmet carrying-handles (?)

All of the Masada handles were found detached from the main objects to which they were originally attached. They all appear to be slightly less than three fingers wide, though they are stylistically close to western examples. Since no definite criterion for the identification of such handles has been established, and, in fact, similar handles have been found attached to mirrors, the association of the Masada handles with helmets is uncertain (Mirror handles: Hayes 1984, Nos. 269, 321, 324). Moreover, the relatively large number of handles, all of which come from contexts associated with Jewish rebels, and the absence of their direct association with helmets or other military equipment at Masada, suggest that they may not come from helmets.[43]

6. Handle **PL. III.19A: 5**

Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Tower in casemate wall
Excavation number:...1264-2061/1
Material:.....Copper alloy
Dimensions –
Length:.....38mm
Maximum width:.....52mm
Thickness of handle:...4.5mm

A handle with a circular section that tapers to neatly decorated terminals with a pomegranate-shaped tip. Aside from the other objects from Masada described below, its ridged and grooved decoration is paralleled by finds from Corbridge and South Shields (UK), and the Rhine at Mainz (DE) (Robinson 1975, Figs. 79-80; South-Shields: Allason-Jones and Miket 1984, Nos. 3:424-425). Early examples are reported from the Republican site of Cáceres el Viejo (ES) (Ulbert 1985, Nos. 103-108). The handle comes from a tower room of the southwestern section of the casemate wall (*Masada* III, 449-450; Plans 17, 41). The area in front of the entrance to the room yielded the hand-guard of a sword (IN 1273-1787/1), and the fastening loop (?) of a helmet (IN 1273-1748/3).

7. Handle IN 233-1920/1 **PL. III.19A: 6**

A round-sectioned handle with ridged and grooved terminals. One arm is slightly twisted. For parallels see the previous object. It was found in a room used as for dwelling by the rebels (*Masada* III, 570-571; Plan 2). A *phalera* was uncovered in this room (233-1911/6) and a bone ear-lath (233-1857).

[43] Two handles found in Yadin's excavations were not included in the present account (IN 1230-1174; 616-127). They are much too large to be identified as helmet carrying-handles and will be included in the copper-alloy report.

Dimensions – length (distorted): 40mm; maximum width (distorted): 50mm; thickness of handle: 4mm.

8. Handle IN 1248-170/2 **PL. III.19B: 1**

A slightly twisted, rhomboid-sectioned handle. The parts close to the ridged and grooved terminals have a round section. The object comes from casemate room L1248 in the southwestern section of the wall. The room was occupied at the time of the revolt (*ibid.*, 461-462; Plans 42-43).

Dimensions – length: 41mm; width (external): 54.5mm; width (internal): 37.5mm; thickness of handle: 2-4.5mm.

9. Handle IN 1035-30/3 **(not illustrated)**

A rhomboid-sectioned handle with ridged and grooved terminals. It is wider then the other handles under discussion. It comes from a small room in the north-western section of the wall that had clear evidence of rebel occupation (*ibid.*, 425; Plan 36).

Dimensions – length: 31mm; width (external): 65mm; width (internal): 46mm; thickness of handle: 2-3mm.

10. Handle IN 542-836/1 **PL. III.19B: 2**

A round-sectioned handle with ridged and grooved terminals. It comes from a service wing of the western palace that underwent changes during the time of the revolt. The room contained several typical installations from that period, including a stove and two *tabuns* (baking ovens) (*ibid.*, 316-318; Plans 17-18).

Dimensions – length: 36mm; maximum width: 48.5mm; thickness of handle: 5mm.

11. Handle IN 1021-1527/2 **(not illustrated)**

A round-sectioned handle with ridged and grooved terminals. It comes from a Byzantine residential unit (*ibid.*, 434-435; Plan 38).

Dimensions – length: 37mm; maximum width (damaged): 40mm; thickness of handle: 4mm.

12. Handle IN 232-2120/2 **PL. III.19B: 3**

A rhomboid-sectioned handle with ridged and grooved terminals. One arm is lost and the other is distorted.

Dimensions – length (damaged): 28mm; maximum width (damaged): 46mm; thickness of handle: 4mm.

13. Handle IN 1045-1612 **PL. III.19B: 4**

A round-sectioned handle with one missing terminal. It comes from an elongated casemate in the north-western section of the wall that yielded a rich assemblage of finds from the time of

the revolt. A two-meter high conflagration layer, evidence of the intense fire that destroyed the room, contained many finds including about 70 *ballista* balls (*ibid.*, 395-397; Plans 1, 34). Dimensions – length: 39mm; maximum width (damaged): 36mm; thickness of handle: 3.5mm.

B. Armour

Scale armour (*lorica squamata*) PL. III.19B: 5; III.19C: 1-8; III.19D: 1-15

Over 1000 scales were uncovered at Masada (1090 examples) and are thoroughly discussed in Vol. I, Ch. 3 *ii*.

Laminated armour ('*lorica segmentata*')

1. Lobate hinge **PL. III.19E: 4**

Site:.....Masada
Provenance:.....Open area or room near the Casemate Wall
Expedition:.....Yadin (1963-1965)
Excavation No.:...1052-475/2
Material:.....Copper alloy and iron
Dimensions –
Body:.....32x30mm
Diameter of hinge:.....3-4mm
Diameter of pins' heads:...6mm
Height of pins:.....8mm
Thickness of plate:.....3mm
Weight:.....13.69gr

Copper-alloy fully lobate hinge with no central fret (Thomas 2003, type Fiv), to the back of which still adhere ferrous fragments of the plate. In Palestine, parallels are known from Gamala (III.3/B.7-8). The object was found in a beaten earth floor of an open area or a small room to the east of Casemate 1039 (*ibid.*, 423-424, Pl. 36, Ills. 662-664). The same locus retained a harness decoration (III.19/Q.7), two knives[44] and some 90 *ballista* balls.

Dimensions – hinge: 32x32mm; with plate: 35x35mm.

2. Girdle-plate tie-hoop IN 1169-1552/1 **PL. III.19E: 1**

This tie-hoop was originally attached to lesser shoulder guards. It was found in a rebel dwelling unit in the eastern section of the casement wall (*ibid.*, 556-557, Plan 56). One of the edges is chipped, and the inner end is damaged as well. The hook still retains one of the fastening rivets. Two concentric punches encircle the rivet holes, a common feature on objects of this type. The circles may be the impressions of the tool used for the piercing. It may therefore be interpreted as a production element rather than a decorative one (Jackson 1990, 29: 29).

[44] Not a sword as was noted in the report.

Dimensions – maximum length (damaged): 43mm; maximum width: 12mm; thickness of plate: 0.5mm; diameter of loop (external): 10mm; width of loop: 3mm; diameter of rivet's head: 4.5mm; diameter of hole: 2mm; diameter of large circle: 13mm; diameter of small circle: 5mm.

3. Girdle-plate tie-hoop IN 1169-1552/2 **PL. III.19E: 2**

This copper-alloy piece is very similar to IN 1169-1552/2, and certainly comes from the same cuirass. The two fastening rivets are still attached, but the hoop is deformed, presumably as a result of its detachment from the girdle-plate.

Dimensions – maximum length (deformed): 47mm; maximum width: 13.5mm; width (inner end): 9mm; thickness of plate: 0.5mm; width of loop: 3mm; thickness of loop: 1.5mm; diameter of rivet's head: 5mm.

4. Girdle-plate tie-hoop IN 126-235/2 **PL. III.19E: 3**

This is a fragmented tie-hoop that retained its loop and a small part of the elongated plate. The loop's tip is soldered to the plate. It has two side-by-side attachment holes instead of the usual single hole. This irregularity may have been necessary to strengthen a problematic point or perhaps represents a secondary replacement fitting. The tie-hoop comes from a storeroom where clear evidence for post-revolt activity was observed. A 1.2m high mound of refuse occupied a large part of the storeroom (*Masada* III, 53-55, Plan 2).

Dimensions – length (damaged): 22mm; maximum width: 16mm; thickness of plate: 0.5mm; maximum diameter of loop (external): 1.5mm; width of loop: 4mm; thickness of loop: 2mm.

Buckle hinge plates

5. Buckle hinge plate IN 1276-1915/4 **PL. III.19E: 5**

This is part of a fastening set consisting of a buckle plate and hinge plate by which the breast units of the '*lorica segmentata*' were attached to each other[45] and to the uppermost girdle plates.[46] The buckle is constructed from a double length copper-alloy strap folded back on itself, fastened by a disc-headed rivet. The partial split in the rear face of the strap probably occurred during the course of the riveting. A round section pivot, placed at the axis of the folded strap, secures the rectangular section D-shaped hoop and the flat section tongue. The pivot is slightly distorted, indicating that considerable pressure must have been applied by the unit to which it was attached. The buckle was apparently still clasped to the leather strap, whose resistance caused the deformation of the pivot. The buckle plate's end was cut and bent

[45] Corbridge type A-C (Robinson 1975, Figs. 178, 180).
[46] Corbridge type A only (*ibid.*, Fig. 17).

to fit between the two bent projections of the now missing hinge plate. The tongue's tip is slightly chipped.

This type of object is very common at Roman military sites, and may be compared with numerous examples throughout the West (Ulbert 1969a, 45, Taf. 33: 23-38 – with references; Bishop and Coulston 1993, 13-20, Fig. 52). The buckle under discussion is very similar to a buckle of the celebrated collar fragment from London of the 1st century AD (Robinson 1975, Pl. 485). It was excavated in L1276, a tower room that was converted into an industrial installation during the time of the revolt. The fill in this room was rich in organic material and other finds, including military equipment, which are thought to have been looted and collected by the Roman soldiers. The *militaria* included fragments of shields, a few arrowheads and *ballista* balls (*Masada* III, 440-445, Plan 40).

Dimensions – maximum length: 30mm; maximum width: 21mm; maximum length of body (folded): 15mm; maximum width of body: 15.5mm; length of loop: 17mm; width of loop: 18mm; length of tongue: 14mm; maximum thickness of tongue: 2mm; maximum height of tongue: 5mm; width of hinge: 5.5mm; length of pin: 21mm; thickness of pin: 2mm.

6. Buckle hinge plate IN 1110-1535/3 **PL. III.19E: 6**

A D-shaped buckle secured by a round-sectioned pivot to a poorly preserved plate. The round-sectioned hoop is folded over the corroded plate, while the tongue remained in its original position. Similarly bent buckles have been documented at Corbridge (UK) (Allason-Jones and Bishop 1988, Figs. 25, 42-43, 48, 51-52, 55, 58-59), Rheingönheim (DE) (Ulbert 1969a, Taf. 33:29, 35-36), Exeter (UK) (Holbrook and Bidwell 1991, 247:37, Fig. 110). This piece was discovered in tower room L1110 in the eastern section of the wall, which contained many remains associated with rebels activities (*Masada* III, 552-553, Plan 56). A ferrule was further uncovered in this locus (1110-1505).

Dimensions – maximum length: 15mm; maximum width: 18.5mm; length of body (damaged): 13mm; width of body: 14mm; length of pin: 18.5mm; diameter of pin: 2.5mm; length of loop: 15mm; width of loop: 18.5; length of tongue: 14mm; thickness of tongue: 1mm; diameter of rivet's head: 2mm.

E. Shields

Remains of at least ten shields were found during Yadin's excavations.[47] The main assemblages were recorded in three loci, which contained rich collections of dumped objects. One set of fragments comes from the debris in Casemate Room L1039 (the 'casemate of the scrolls'). The other group originates in Tower Room L1276 ('the tannery'). Additional

[47] Future study of the leather remains from Masada may reveal more fragments of shields and other organic military fittings.

assembly was found in L92 – a Square south to the Northern Palace, which was the focus of massive dumping activity (*Masada* III, 112-114, Plans 2, 3). In addition, a well-preserved painted fragment was found in one of the caves of the southern cliff – L2050.
Shields have rarely been found at Roman sites due to the perishable nature of the wood, cloth, leather and fibres from which they were made. Outside the celebrated shields assemblage from 3rd century AD Dura-Europos, the Masada collection is the largest known from the Roman world (Cumont 1926: 261-263; Hopkins 1931: 72, 74-75; Brown 1936: 456-63; Brown 1939: 328-331). As in Dura-Europos, the arid conditions at Masada contributed much to the preservations of the shields including elements such as paint.

Two major types of shields are represented in Masada. The most common type is constructed of three layers of pressed wood or fibre layers, covered on both sides with leather. Evidences from L1276 clearly indicate that it had rectangular outlines with leather binding, very close in shape to the shields uncovered in Vindonissa (CH), both according well with the standard shield of the Legionaries – the *scutum* (Gansser-Burckhardt 1942, 74-79, Abb. 49-53). It should be emphasise that the corner represented on the leather facing (IN 1276-1785) is slightly rounded, in a like manner to the Vindonissa examples as well as to the outlines of the shield from Doncaster (UK), and the recently discovered covers from Roomburg (NL) (van Driel-Murray 1999, 49ff). The fact that the well preserved fragment of the *scutum* (IN 1276-1785) shares the same construction method with the rest of the associated fragments, in particular the usage of vegetal fibres in the production of the board, seemingly suggests that they should all similarly identified, i.e. as *scuta*. Part of the examples of this type had painted leather facing (IN 1039-139 and 1039-151).

A possible variant of this type was found in L1276 and L2050. It characterised by the employment of plywood planks rather than vegetal fibres. A copper-alloy U-binding sheathed a board of two plywood layers angled to each other in 90° (IN 1276-1802), which were coated on both sides by fibres (palm?). The latter may have served as a base for leather facings. The fragment was too small for determining whether leather facings indeed existed. An additional example is presented by one specimen (IN 2050-11/4), consisting of two layers of wooden planks on top of which was laid a pale fabric, soaked with glue, that acted as a binding agent for the leather painted facing. The group of shields that comes from the excavations at Vindonissa is apparently constructed of lightwood with a covering of linen and leather, which was glued in place (Gansser-Burckhardt 1942, 73-89).
The producer of shield 2050-11 used, in addition to the glue soaked textile, a tiny copper-alloy pin for the attachment of the leather facing to the board. A unique construction method

of wooden pins and accommodating holes was observed on the plywood planks of shield 1039-61. The pins fastened the planks to each other.

From the discussion above it is obvious that, at Masada, leather sheets were used as an integral facing of the shield (*ibid.*, 74). Both the front and rear faces were coated with leather (also in Doncaster-Buckland 1978, 251). This clearly differentiates the Masada assemblage from the west, where most leather fragments, associated with shields, appears to be interpreted as covers. The different climatic conditions may account for this variation, as the arid climate of east makes the employment of covering unnecessary. The account of Josephus Flavius of the dire hunger in Jerusalem illustrates the local employment of leather facing for shield construction:

> 'Necessity drove the victims to gnaw anything, and objects which even the filthiest of brute beasts would reject they condescended to collect and eat: thus in the end they abstained not from belts and shoes and stripped off and chewed the very leather of their bucklers' (*BJ* 4.196-197).

The second type is somewhat difficult to characterise, as only few fragments of it have preserved. Excavated in L92, the seven fragments, nevertheless, testify to the existence of a shield board constructed from relatively thick wooden planks. Though it is impossible to assert the exact outlines of the shield as none of the edges has preserved, their resemblance to the oval plank shields from Dura-Europos, as is discussed below, suggests a reconstruction of oval shield seemingly with leather edging (Brown 1939). A certain fragment of the type is documented in the Cave of the Pool (V.15/E.1). If indeed identified as such the fragments from Masada are the earliest representation of the type, ante-dating the Duranic examples some eighteen hundred years and the Second Revolt specimen by six decades.

Decoration

Other than applied red paint on three shields, no definite decoration has noticed on the shields from Masada. The leather facing of IN 2050-11/4 was painted crimson red. Faint remains of red paint were observed on the facings of two additional shields, IN 1039-139 and IN 1039-151. Other leather facing may have been painted as well, but the colour has long perished. In the Roman period, painted shields were reported to date from Dura-Europos alone (Cumont 1926, 262-263, Rostovtzeff et al. 1936, 327-337; Rostovtzeff, Brown and Welles 1936, 456-466; 326-369). In the Hellenistic period, a single example of painted shield was unearthed at Ai Khanoum in Afghanistan (Bernard 1973).

Several consecutive stitching holes on a leather facing from L1276 (IN 1276-1785) mark the outlines of a now unfortunately perished *ansata* appliqué which in complete parallels from the

west manifest the unit designation (van Driel-Murray and Gechter 1983, 35-36; van Driel-Murray 1999, Fig. 3). An embossed strip upon the face of a large fragment of a shield (IN 1039-139) may have been an ornament, though it seems more appropriate interpret it as an imprint of a reinforcing bar.

Edging techniques

Most of the shields' perimeters have not preserved. However, from the few available evidences it is clear that two different methods were used for the shields' edging. There are two distinct examples for leather binding along the shields' perimeter. In addition, copper-alloy U-sectioned bindings are recorded at Masada. Flat-headed copper-alloy nails fastened the binding to the shield board. The nails were inserted through holes pierced in the binding, rather than through lobate expansions that extended from the binding, a more popular method in the Roman west (Bishop and Coulston 1993, 82; Groenman-van Waateringe 1967, 72, Fig. 18).

Bosses and gripping devices

There is no record for bosses at Masada and little did any evidence of gripping devices come down to us. Nevertheless, one example of a reinforcing bar/grip (1103-1751) while an impression of possibly a reinforcement bar may be observed on the leather layer of shield IN 1039-139 (see below).

1. Shield fragment IN 1039-139 **PL. III.19F: 1-2**

The fragment is preserved to a maximum length of 580mm and a maximum width of 330mm. It consists of three thin layers of pressed wood or plant fibres (seemingly palm), both sides of which are covered with leather. It is intriguing to learn which of the leather layers was originally the front facing and which the rear. The answer appears to be linked with an element discernible on one of the leather facing. There, a faintly impressed empty strip, 20mm wide, preserved for a length of 480mm (note arrows in **PL. III.19F: 1-2**). It may be interpreted as a decoration, as in some cases leather coverings of the shields from Vindonissa is marked by faint impressions that originally bore applied decoration (Gansser-Burckhardt 1942, 76-89). However, when compared with the shields from the Roman west, it seems right to offer a more practical function for it. On one of the leather facing from Vindonissa, a long impressed strip was observed and identified as the imprint of the shield's reinforcing strip (Vindonissa: Gansser-Burckhardt 1942, Abb. 56-57; Bishop and Coulston 1993, 82). The length and straight elongated shape of the element on the Masada shield, compares well with the Swiss example, suggesting this leather covering to be the rear facing. A close examination of the other facing layer reveals remains of red paint. This appears to accord with the above

mention reinforcing bar imprint, which identifies its bearing covering as the rear facing. Furthermore, the later exhibit no trace of paint. It therefore seems safe to determine that it is the front facing which was painted red (much like IN 2050-11/4), while the rear facing, other than the attachment of the reinforcing strip, was not subjected to any additional treatment.

The shape of the shield is untraceable due to the lack of the shield's edges. Nevertheless, the construction method, which appears very akin to 1276-1785, clearly suggests that this is a fragment of a *scutum* (see discussion above). The alignment of the wooden or fibre layers appears to follow the standard arrangement. The medial layer, of IN 1039-139, is laid 90° to the front and rear layers, a common arrangement that provided the shield with better resistance to missiles.

Dimensions – 580 x 330mm; thickness of leather facings: 1mm; thickness of wooden layers: 0.5-1mm.

2. Shield fragments IN 1039 (?) **(not illustrated)**

There are three pieces of wood, one of which is just a plain irregular plank 160mm long x 30mm wide x 5mm thick (maximum dimensions). The other two pieces of wood are covered with what appears to be bitumen to which pressed wood or fibres and leather still adhere. The maximum dimensions of these two pieces of wood are 190mm x 70mm x 1mm and 15mm x 6.4mm x 1mm.

These notes were taken some years ago for fragments from L1039 (by Jodi Magness). Nevertheless, the exact context is not clear, as they are not available at present. It may belong to basket 124, as the basket list noted the find of shield fragments of plywood and leather under this registration. However, the existence of the bitumen and the number of the fragments involved appears to indicate that in fact these are the items described below in No. 6.

3. Fragments of shield board IN 1039-61 **PL. III.19G: 1**

Some fifteen shields' fragments of plywood are reported from L1039. They were all registered under one number and according to the basket list they were considered by the excavators as fragments of the room's ceiling. The locus card refers to this find, noting that the fragments were stratified directly under the upper most collapse of the walls, in the top of the rich layer of dumped material, which included scrolls, papyri, a hoard of 17 silver coins and numerous other objects, most notably organic finds (*Masada* III, 416-422, Plan 36).

The sizes of the fragments vary, yet all were worked, as attested by the clear tool marks on some of the remains, small attachment holes for wooden pegs, and bevelled edges of three fragments. Due to the fact that some of the fragments were mended together it seems

reasonable to assume that all had belonged to one common board. Should this is indeed the case, than one may provide a fair idea on the image of the shield.

One fragment is of particular importance as it exhibits two layers laid at right angles to each other. The layers were strengthened by way of a unique constructional feature – fastening minute wooden peg that was inserted through small holes. Such holes are visible on several more fragments of the group. This method reminds the employment of small copper-alloy nails for rather similar purpose noticed on shield fragment IN 2050-11/4 (see below).

None of the plywood strips has preserved to its complete length. Only one fragment appears to display its original breadth – 70mm. If we compare it to the dimensions of the Republican shield from Kasr el-Harit, Fayum (EG) (Kimming 1940), the fragment clearly falls in the range of the vertical strips.

The edges of three pieces were bevelled, thus denoting the shape of the shield was rather oval. Nothing in the edges testified for the existence of stitching holes or any other sort of binding. The thickness of the fragments varied from 1.5mm to 3mm. The fragments of the edges were 3mm thick.

Summing up, IN 1039-61 consists of fragments of an oval shield that was constructed from at least two layers of plywood strips. The strips were arranged in right angle to each other. We have no information with regard to the facing of the plywood body nor do we posses any knowledge of the manner the edges were bound, if at all.

IN 1039-61/1

Dimensions – 59x79mm; thickness: 1.5-2mm

IN 1039-61/2

Dimensions – 142x40mm; first plank: 142x30mm; thickness of first plank: 1.5mm; second plank: 40x28mm; thickness: 1-1.5mm.

IN 1039-61/3

Dimensions – 103x31mm; thickness: 1.5mm

IN 1039-61/4

Dimensions – 172x101mm; first plank: 172x52mm; thickness 1.5mm; second plank: 101x40mm; thickness: 1.5mm.

IN 1039-61/5

Dimensions – 120x71mm; thickness: 3mm

IN 1039-161/6

Dimensions – 136x29mm; thickness: 15mm

IN 1039-161/7

Dimensions – 143x34mm; thickness: 2mm

IN 1039-161/8

Dimensions – 142x73mm; thickness: 2mm

IN 1039-161/9

Dimensions – 136x47mm; thickness: 2mm; diameter of attachment hole: 1mm

IN 1039-161/10 (edge)

Dimensions – 90x21mm; thickness: 2mm; diameter of attachment hole: 1mm

IN 1039-161/11 (edge)

Dimensions – 106x20mm; thickness: 3mm

IN 1039-161/12 (edge)

Dimensions – 109x22mm; thickness: 2.5mm

IN 1039-161/13

Dimensions – 120x54mm; thickness: 2mm

IN 1039-161/14

Dimensions – 93x33mm; thickness of first plank: 1.5-2mm; diameter of attachment hole: 1mm; second plank: 17x18mm; thickness of second plank: 1mm

IN 1039-161/15

Dimensions – 82x25mm; thickness: 1mm

4. Fragment of bound shield board IN 1039-151 **PL. III.19G: 2**

Described in the basket list as 'wood nailed with bronze', the poorly preserved object is in fact a small fragment of shield board whose edge is bound by copper-alloy U-binding. The body consists of at least two plywood layers. The front layer is vertically aligned with regard to the binding, while the rear layer is laid in right angle. On the upper most layer remains of thin leather facing, parchment-like layer, whose face is dyed red. In Masada red paint adorned the front leather facing of the shield fragments from 2015-11/4 and 1039-139.

The fragment has three copper-alloy nails, one of which is still fastened to the fragmentary binding. The tips of the nails' shanks are bent, thus providing us with the original thickness of the body of the shield – 7mm, verified from a minute preserved fragment.

Dimensions – 110x35; length of U-binding (damaged): 35mm; width of U-binding: 12mm; diameter of nail head: 6mm; thickness of shield board: 7mm.

5-6. Fragments of two shields from L92 **PL. III.19G: 3-4; III.19H: 1-2**

The second group of fragments comes from L92, the open square to the south of the Northern Palace. As noted above, a rich assemblage of finds was there dumped. Fragments of two shields were uncovered, including overall number of eight fragments.

The largest fragment of the group presents the first shield (**PL. III.19G: 3-4**). Its maximum dimensions are 290mm x 215mm. The fragment is made of three layers of pressed wood or fibres laid at right angles to each. These layers of wood or fibres are covered on both sides with leather facings. The later bear no traces of decoration. A small section of the shield's edge, 60mm long, has survived, featuring a leather binding. The shield is edged by a bound hem: a leather strip, about 26mm wide, that was folded over and stitched to the perimeter of the shield. One line of stitching holes was pierced through both the leather facings and three wood pressed or fibre layers in accordance with the holes in the binding strip. Four holes, 9mm apart, having the stitching threads still in place, are visible. For sewing of the binding, the shield maker used two threads simultaneously – executing a running stitch. This method was also applied on shield IN 1276-1785, differing from the shield under discussion in the employment of thin leather strips for the stitching (see below).

A pair of leather bands pierces the shield's wooden body, some 140mm from its above mentioned edge. The exact nature of this feature is not clear. Due to the state of preservation it is not possible to determine whether the bands pierced the leather facing as well. Should the answer is negative, the bands may have served as a stabilising mean for the wooden part of the shield, which was later concealed by the coverings. However, if this bands run through the exterior leather layers, creating two adjacent loops, it could have functioned as a sort of clasp. The later may held a carrying strap or a gripping device. Two fragments of a corded strap were included in the same basket. If they are indeed associated with the shield fragment, they may present a corded gripping device, though the last notion seems highly speculative.

Some chunks of what appears to be bitumen are adhered to a small section of the exterior face of one of the leather layers. They do not appear to be part of the original structure of the shield.

The remains of the second shield of L92 consist of seven wooden plank fragments (**III.19H: 1-2**). Tool marks are observable on some of the fragments. The thickness of the planks ranges between 5mm to 6mm. There is no evidence that the shield was construct from more than one layer of wooden planks. The planks were presumably glued to each other. It is difficult to determine the outlines of the shield as none of the fragments is from the shield's edge.

Nevertheless, its structure is very similar to that of the celebrated oval wood plank shields from Dura-Europos, suggesting the second shield from L92 had oval shape. The question of facing is even more puzzling. Three of the fragments bear chunks of bitumen-like substance. However, this, as with the first shield from L92, may have nothing to do with the original facing of the shield. First, the material is not proving to be a constant coating layer. In addition, the other four fragments bear no sign for such a treatment. It therefore appears reasonable to assume that this origin of the material involves a post-deposit process, taken into consideration the extensive scale of dumping activity that took place in the L92. Still, a small copper-alloy nail that is attached to one of the fragments may hint to the existence of leather covering. This assumption is based upon the small copper-alloy nail noticed on the fragment from 2050-11/4, which was used to secure the leather covering to the body of the shield.

The measurements of the fragments are:
130x61mm; thickness: 5mm.
150x71mm; thickness: 5mm.
258x34mm; thickness: 6mm.
249x28mm; thickness: 5mm.
150x60mm; thickness: 5mm.
145x34mm; thickness: 5mm.
164x27mm; thickness: 5mm.

7. Shield fragment IN 1276-1785 **PL. III.19I: 1-2; III.19J: 1-3**

The most distinctive shield remains were unearthed in L1276 ('the tannery'). Two large fragments of leather front facing, and some nine smaller segments, with remains of attached wood and vegetal fibre layers, were there found. The label on the box that contained the fragments read 'leather shirt'. The main interest, in addition to the actual existence of another shield at Masada, lays in the fact that parts of the edges of both fragments have survived, allowing us to reconstruct or identify the shape of the shield. It is not certain whether both fragments belong to the same buckler as mending the two together proved impossible. Still they were registered under the same basket number and feature very similar characteristics.

The first large fragment, with the maximum dimensions of 300x210mm, was torn from the curving section of a shield. Its apex is very slightly curved, nearly straight, while the side appears to be straight. Judging from its outlines and dimensions, compared with western example, it is clear that this fragment is one of the corners of a rectangular shield. This type is reported to date from Vindonissa (CH), Doncaster (UK), and Roomburg (NL) (Vindonissa (Gansser-Burckhardt 1942, 74-81); Doncaster (Buckland 1978); Roomburg (van Driel-

Murray 1999). The fragment had leather binding that was ripped from the main body, as attested by the remains of the stitching holes. In all likelihood a bound hem edged the shield as is visible on the second fragment and in shield IN 1039-139. The facing of the shield is covered with numerous straight scratches, which may be the result of combat or simply usage. Two parallel impressions run horizontally across the width of the fragment, 200 and 240mm below its apex. Their nature is obscure, yet we should not overrule the possibility of post deposition processes as the cause for their existence. The back of the fragment exhibits the clear remains of the plywood layer to which it was most probably glued. Between the leather facing and the plywood layer scant remains of vegetal fibre layer are visible. The latter had the function of attachment agent, similarly to the textile layer identified on shield IN 2050-11/4. This layer is clearly recognisable on the second large fragment (see also below IN 1276-1802).

The second substantial segment measures 460x390mm. A fine example of leather binding (150mm long) has preserved. A leather thread was used for it's stitching. A rare feature, of stitching holes arranged in a square-like manner, is visible on the damaged edge of the facing, no doubt the remains of an *ansata* appliqué (~75x28mm). Unfortunately, no sign of letters is traceable. In the light of the parallels from the west that retain *ansatae*, the fragment under discussion seemingly constituted part of the upper left segment of the leather facing. The fragment's back exhibits remains of the wooden layers.

Several more fragments of the same board were recovered. Their measurements are: 240x120mm; 160x70mm; 78x97mm; 120x130mm; 61x66mm.

8. Shield binding IN 1276-1802 **PL. III.19K: 1**

Two fragments of copper-alloy U-binding are recorded in L1276. The large fragment consists of two plywood layers, which are covered on both sides by layers of vegetable fibres (presumably palm). The employment of such matrix is common at Masada, similarly to the, noted above, employment of textile. The fibres were soaked in glue in order to improve the attachment of the leather facing to the wooden board. Due to the dimensions of the fragment and its state of preservation, it is impossible to determine whether leather facings covered the board. Two copper-alloy nails attached the U-binding to the board. The shanks of the nails were bent over the rear face of the binding.

The small fragment did not preserved well (not illustrated). One can notice two wooden layers and fragmentary copper-alloy U-binding with one copper-alloy nails still in place.

Dimensions of large fragment: 67 x 20mm; length of binding (damaged): 67mm; width of binding 15mm; width of binding (unfolded): 29mm; diameter of heads of nails: 7-8mm; thickness of wooden layer: 2mm.

Dimensions of small fragment: 51 x 15mm; thickness fragment: 6mm; diameter of head of nail: 6mm.

9. Shield binding IN 1276-2268/1 **PL. III.19K: 2**

Additional copper-alloy binding was unearthed in L1276. Preserved to the length of 240mm, the structure of this U-binding is more flimsy from the previous item. The edge of the bindings is slightly folded over itself. Eight attachment holes are spaced along the object, one of which contains the flat headed copper-alloy nail. The distance between the holes varies between 27mm to 32mm.

Dimensions – length (damaged): 240mm; width 20mm; width (unfolded): 40mm; diameter of head of nail: 5mm.

10. Shield fragment IN 2050-11/4-3 **PL. III.19K: 3**

This exquisitely preserved fragment (2050-11/4) comes from a cave in the south cliff of Masada (the locus is not included in *Masada* III). Its facing consists of a very thin layer of animal skin. The skin was painted crimson red, like that of the leather scabbard discussed above (see above IN 1244-210). It was laid on top of soaked glue khaki coloured textile. The textile is glued to the wooden board of the shield, which is constructed of two layers of plywood. Each of the plywood layers is 2.5mm thick. The outer layer was laid at a 90° angle to the inner one; the latter is too small to determine its original orientation. The plywood layers were attached using glue and tiny copper-alloy nails. One headless nail visible in the upper layer has a stem just long enough to pierce two plywood layers. The method of construction used for the Masada shield is remarkably close to that found in Polybius' description of the *scutum*: 'It is made of two planks glued together, the outer surface being then covered first with canvas and then with calf-skin' (*Hist.* 6.23.3). An additional small leather fragment of the frontal facing (2050-11/3) has preserved. This very thin fragment was found detached from the main body and the paint is now lost.

The arrangement of the wooden layers strengthened the shield's durability against missiles. The textile layer provided additional reinforcement, though its primary task was to bind the facing skin and the plywood boards. In the Roman period, the only evident parallel to the painted leather facing outside Masada comes from the rich assemblage at Dura-Europos.

Dimensions (2050-11/4): 129x67mm; thickness: 5mm; upper plank: 55x64; thickness of upper plank: 2mm; lower plank: 94x16mm and 129x22mm; thickness of lower plank: 2-2.5mm.

Dimensions (2050-11/3): 36 x 39mm; thickness: ~0.5mm

11. Shield strengthening bar **PL. III.19K: 4**
Site:.....Masada
Expedition:.....Yadin (1963-1965)
Excavation number:....1103-1751
Material:.....Iron
Dimensions –
Length:.....486mm+ (333+153mm)
Width:.....16mm (terminal: 18mm)
Thickness:.....2mm
Diameter of pins heads:...12, 13, 12-15mm
Weight:.....103.27gr

F. Edged weapons

1. Sword (*gladius Hispaniensis*) IN 145-1510 **PL. III.19L: 1-2**

This sheathed sword was uncovered in a conflagration layer above the floor of the western corridor (L145) of the storeroom complex. The excavators suggested that the sword fell together with numerous other objects found in its vicinity from shelves. The conflagration layer is the result of the fire that destroyed the storerooms at the end of the revolt (*ibid.*, 61-63, Plan 2). A lunate pendant was also uncovered in this locus (145-1315/1; below III.17/Q.9).

The iron sword was found in a poor state of preservation, and was conserved and mended shortly after the end of the excavations. A re-examination of the sword has indicated that it was improperly restored, with some parts having been incorrectly placed. This, however, does not prevent us from determining its type. Though initially identified as a *spatha* (Magness 1992, 64), the stout rhomboid section (i.e., with two working edges) and dominant tapering tip clearly indicate that it is a *gladius*. The versatility that the double-edged blade provided for slashing and the tapering tip for stabbing is described by Polybius (Polyb. *Hist.* 3.114). This kind of infantry sword, which is the traditional legionary weapon, has several sub-types (Ulbert 1969b). The Mainz-type, popular during late Republican times to the mid-1st century AD, was followed by the Pompeian-type (Bishop and Coulston 1993, 69, 71). In the recent years several examples of the earliest version of the type, known as the *gladius hispaniesis*, were discovered. The latter two types differ from the *gladius hispaniesis* in their blade length and shape, with that of the early type being longer and noticeably more waisted.

Sheathed in a copper-alloy U-section guttering, the sword from Masada has a broken tang of ovoid section from which the blade with sloping shoulders extends. The blade is 610mm long and its upper, best-preserved part has a double-edged construction. Though concealed by the scabbard binding and suffering from the swelling of the iron, the blade appears to be

waisted.[48] It terminates in a long tapering tip. Except for the length, these traits are indicative of a Mainz-type sword. However, this identification and the *terminus ante quem* of 73-74 AD provided by the sword's context seem to be inconsistent with what is known about the *gladius* during the second half of the 1st century AD. As Feugère illustrated, this type appears to grow smaller over the course of time (Feugère 1993, 99 (bottom), 140 (table)). The 610mm length of our blade suggests that the sword antedates the time of First Revolt. Based on what is known about the evolution of the double-edged sword, our sword should be assigned to the second half of the 1st century BC. The length of the blade falls between that of the Delos blade (631mm) of 69 BC and a blade from Bonn RLM (591mm).[49] Josephus's account may help to resolve the confusion surrounding the apparent inconsistency in the sword's dimensions and the date of its context. Josephus narrates that when the Jewish rebels conquered Masada, they found weapons of all kinds that had been stored there by King Herod the Great: 'sufficient for ten thousand man' (*BJ* 7.299).[50] It is not unlikely that our sword was originally part of Herod's arsenal of weapons, which later fell into the hands of the Jewish rebels. The long life of military equipment is a well-known phenomenon in the Roman world (Künzel 1994, 33-58).

Dimensions – total length: 650mm; length of tang (damaged): 40mm; length of blade: 610mm; length of tapered tip: 170mm; width of tang: 17-20mm; width of blade: 46-52-62mm; thickness of blade: 17-25mm; length of sheath (damaged): 385mm width of sheath: 13mm.

2. Sword blade IN 1138-1362/2 **PL. III.19M: 1**

Fragments of a second sword come from L1138, a tower on the eastern side of the casemate wall, which showed clear signs of rebel occupation (*Masada* III, 536-537). This locus is of particular interest because a group of three iron objects was found just inside the entrance to the room: this sword, a spear (IN 1362/1), and a mortise chisel (IN 1362/2). The sword is very corroded and consists of one relatively large fragment and a number of tiny pieces. In shape the sword appears to have been long and flat, with no central rib discernible. Due to the poor state of preservation, it is impossible to determine whether this is a *gladius* or a *spatha*.

Dimensions (of the large fragment): maximum length: ca. 194mm; maximum width: 42mm; thickness: 20mm; total weight of all the fragments: 157.10 gr.

3. Sword IN 1201-371 **(not illustrated)**

[48] A sculptured example of this feature is attested on a late Augustan relief from Plazzo Ducale, Mantua; *cf.* Robinson 1975, Pl. 450.
[49] A group of examples is noted in Connolly 2000.
[50] See also the discussion of the bronze arrowhead and the conclusion below.

The third sword comes from L1201, a casemate room on the southeastern side of the mountain that was occupied at the time of the revolt. It was rich in pottery and other finds, including what was interpreted as a group of medical instruments (*ibid.*, 501-504). The sword consists of three fragments. Its original shape and outline cannot be determined because of its poor state of preservation.

Dimensions (of the largest fragment): length: ca. 95mm; width: 48mm; total weight of all three fragments: 101.46 gr.

4. Sword? IN 861-298 **(not illustrated)**

A group of corroded and fragmentary iron pieces from L861 may constitute the remains of a fourth sword. They come from a room constructed at the time of the revolt (*ibid.*, 356-357).

5. Dagger **PL. III.19N: 1**

Site:.....Masada
Expedition:.....Yadin (1963-1965)
Provenance:.....Casemate Room
Excavation number:...1204-748 (IAA No. 93-2726)
Material:.....Iron
Dimensions –
Total length:.....225mm+
Length of blade:.....190mm
Width of blade:.....36mm
Thickness of blade (distorted):...200mm
Thickness of tang (distorted):.....320mm
Weight:.....192.47gr+

A very corroded iron dagger. The tapering blade is swollen due to corrosion, both its tang and tip are missing. It was uncovered in Casemate Room that was occupied by the rebels (*Masada* III, 498-499, Pl. 47).

Sword handgrips

Fragments of six handgrips were uncovered at Masada, three of which derive from the complex of the Western Palace. All grips but one are made of bone, while the additional example is of wood. The wooden grip and four of the bone specimens belong to the well-defined ribbed type, customarily associated with the *gladius* (Greep 1984, 122-123). Three bone examples share the characteristic octagonal cross-section. The grips are too fragmentary to determine whether they were indeed produced from cow's longbone as the evidences in the Roman west show rather conclusively (Greep 1989, 20; Bishop and Coulston 1993, 71, 193). Complete examples are recorded throughout the empire, the decisive part of which are made of bone, though several wooden grips are as well reported (Bone handgrips: Unz and Deschler-Erb 1997, 15, 25-43 with extensive bibliography; Greep 1989, 20, Figs. 3-5; Ulbert 1969b, 97-99, Taf. 17, Abb. 1, 3, Taf. 18, Abb. 1a-b; Greep 1984, 122-123; Gerhartel-

Witteveen and Hubrecht 1990, 99, 102, Figs. 2-4; Boube-Piccot 1994, 142-143, Nos. 234-236; Vanden Berghe 1996, 84, 86, Fig. 15: 2; Feugère 1997, 3-6, Fig. 2: 1-3).

6. Bone handgrip IN 443-152/2 **(not illustrated)**

A very small bone fragment of a *gladius* handgrip was uncovered at Room 443, which consists part of the Side Entrance Wing I of the Western Palace (*Masada* III, 284-285, Plans 17-18). In the room the excavators identified 'three foci of particularly fierce burning', which 'may attest to the deliberate incineration of various objects' taking place towards the end of the Roman siege (*ibid.*, 285).

The face of the well-polished object exhibits burning signs, which may by held responsible for its destruction. The octagonal cross section is detectable via the three vertical ridges that run along the object. Also visible is one of the typical ribs that were produce to allow better gripping. Examination of one of the object's vertical edges reveals an extremely thin section. This, presumably unintentional fault of production, certainly did not contribute to the strength of the grip. For parallels see above.

Dimensions – maximum length (damaged): 29mm; maximum width (damaged): 19mm; thickness: 1.5-7mm.

7. Bone handgrip IN 458-69/2-3 **PL. III.19O: 4-5**

Two fragments of a bone handgrip were uncovered at the Reception Room of the Western Palace, also known as the 'Throne Room'. The unique room in the Palace's core was the focus point of a raging fire that consumed a large number of furniture. The object presents the typical ribs and vertical ridges, of both two ribs and ridges have survived. One the fragment (IN 458-69/2) features one end of the handgrip. An additional fragment of a *gladius* handle was uncovered in the same locus (IN 458-85).

Dimensions (458-69/2) – maximum length (damaged): 38mm; maximum width (damaged): 18mm; thickness: 4-7mm.

Dimensions (458-69/3) – maximum length (damaged): 40mm; maximum width (damaged): 15mm; thickness: 2-5mm.

8. Bone handgrip IN 458-85 **(not illustrated)**

The 'Throne Room' has yielded a bone fragment of an additional handgrip. Like the previous item (IN 458-69/2-3) this grip is severely scorched. One of the grip's rims is visible. It has a dominant horizontal rib but no vertical ridges. Similar phenomenon is indicated on bone grips from Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 32 and 41).

Dimensions – maximum length (damaged): 37mm; maximum width (damaged): 20mm; thickness: 4-6mm

9. Bone handgrip IN 441-1112 **(not illustrated)**

A much burnt small fragment of a bone handgrip was excavated at L401 of the Western Palace. Its condition is not surprising as the courtyard it originated in suffered a very strong conflagration (*Masada* III, 240). The two typical vertical ridges and one rib that survived the consuming fire, confirm its identification. For parallels see above.

Dimensions – maximum length (damaged): 25mm; maximum width (damaged): 13mm; thickness: 3-5mm.

10. Wooden handgrip IN 1276 **(not illustrated)**

A single example for wooden sword's grip was unearthed in Tower Room 1276, which during the revolt was modified into a Tannery (*ibid.*, 440-445, Plans 17, 40). The inner space of the room contained an exceptionally large number of artefacts, most notably organic material, a phenomenon only paralleled by L1039 ('The Casemate of the Scrolls'). This fill was interpreted as an intended accumulation dumped by the Roman soldiers, following looting activity of the site (*ibid.*, 445). Unfortunately, the sole record available for the object is the locus where it was found.

Parallels – Ribbed handle from Vindonissa (Unz and Deschler-Erb 1997, 15, No. 44).

Dimensions – maximum length (damaged): 53mm; maximum width (damaged): 23mm; thickness: 3-6mm.

11. Bone handgrip IN 336-87 **PL. III.19O: 6**

A fragment of a bone grip whose face is decorated by incised vertical bands was found in a room of residential building No. IX. In this room a rich assemblage of artefact of high quality nature was revealed. Netzer suggested that the room was occupied by a wealthy family of rebels or may have functioned as an assembly point for the looting Roman soldiers (*Masada* III, 208).

Only the lower half part survived, including the rim of the artefact. We may determine the original orientation of the grip that widens to accommodate the grasping hand, according to the dimensions of the vertical hole. The nearly square sectioned hole is narrowing from the lower rim forward. Its inner face still retains signs of iron oxidation, undoubtedly from the iron tang.

Dimensions – length (damaged): 41mm; width (damaged): 18-22mm; thickness: 5-7mm; width of vertical decorative bands: 1.5-2mm.

Sword handguard

A rare type of sword handguard was uncovered at Masada. Made of bone or ivory it features a V-like decoration that adorns its frontal face. At Masada, a total number of four similarly marked handguards were discovered. In the western part of the early Empire these objects were also made of wood and ivory (Bishop and Coulston 1993, 71, Fig. 37). The Masada handguards are paralleled by a nearly identical bone handguard from Rheingönheim (DE), where another V-marked handguard has been reported (Ulbert 1969a, 56; Abb. 6: 1; Taf. 60: 1-2). Recently, three more V-marked handguards were published from Vindonissa (CH) (Unz and Deschler-Erb 1997, 14-15, Nos. 22-24; Pl. 2 – with bibliography).

12. Bone handguard IN 1273-1787/1 **PL. III.19O: 1C, 2C**

This is a well preserved, carefully carved and polished bone handguard found just east of tower L1264 (*ibid.*, 450, Plan 41). It is semi-circular in section. The surviving half has a decorated band consisting of two raised ridges encircling its base. The upper part of the centre has a curved, V-shape. The rectangular opening for the tang is visible on the upper and lower faces. The two side holes and the inner face are, in fact, the negative of the bone soft tissue that was removed. We have no information regarding the method used to close the side holes (possibly by bone plugs?)

Dimensions – width 65.5mm; height: 26mm; side hole (left): 15mm; side hole (right): 12mm; thickness 7mm; width of tang's hole (upper): 14mm; width of tang's hole (lower): 16.5mm; height of the decoration band: 3mm.

13. Bone handguard IN 1054-837/1 **PL. III.19O: 1D**

A fragment of bone handguard was uncovered in a pit next to the south wall of the synagogue (*ibid.*, 413; Plans 34, 36). The adjacent area yielded a few *ballista* balls (*ibid.*, 413; Holley 1994, 365). Somewhat more crudely finished than the previous object, the well-polished handguard has a schematic triangular mark, while remains of the soft tissue are visible on its inner face. The removal of the latter left the piece with two holes on its sides. The hole for the sword tang is circular. See above for parallels.

Dimensions – width: 62mm; height (damaged): 25mm; thickness: 10mm; diameter of tang's hole: 6mm.

14. Bone handguard IN 176-75/1 **PL. III.19O: 1E**

This is a small fragment of a bone handguard that still bears the marks of a triangular decorative motif. The decoration of the more complete example represented by IN 1273-1787/1 (see above) suggests that this is a fragment of the upper part of a handguard. Like the

previous three handguards, the inner soft tissue was removed, which would have left two side holes when it was complete. The hole for the sword's tang is circular. See above for parallels. This piece comes from a storeroom annexed to Building No. VII. This room is part of a three-room complex, the entrance to which was strictly controlled by guardroom L179. On the basis of an architectural analysis, Netzer has suggested that Herod's arsenal (mentioned in Josephus' account) was located in storerooms L175-177, adjacent to Building No. VII (*Masada* III, 175-176; Plan 1).

Dimensions – width: 53mm; height (damaged): 13mm; thickness: 8mm; diameter of tang's hole (upper): 7mm; diameter of tang's hole (lower): 8mm.

15. Ivory handguard IN 126-277 **PL. III.19O: 1B**

This is a fragmentary ivory handguard with triangular decoration from storeroom L126 (*ibid.*, 53-55; Plan 2). Only the right part, in high relief, and a section of the triangular decoration have survived. The selection of ivory as the raw material may account for the visual differences between this object and the three previous handguards. For example, since this object had no soft tissue like the bone handguards, it has no side holes. The inner face of the rectangular tang hole has traces of iron patina, undoubtedly from the oxidised sword's tang.

Dimensions – width (damaged): 38mm; height (damaged): 28mm; thickness (damaged): 16mm; internal length of tang's hole (damaged): 8mm; internal width of tang's hole (damaged): 8mm.

Sword Pommels

Both bone pommels presented at Masada shares the same characteristics of main and small crossing holes and exhibit decoration of incised horizontal grooves. The horizontal hole may have used as a mean to strength the pommel to the tang. The two objects suffered much from fire as attested by their scorched black body.

16. Pommel IN 456-396 **(not illustrated)**

This round pommel is made of fine polished bone with two flat ends. Its blackened exteriors the result of intense burning. It was found in the heart of the western palace, in a room that was destroyed by a strong fire (a 50cm thick conflagration layer covered the mosaic floor) (*ibid.*, 249-250). The room also contained dozens of iron arrowheads and several wooden foreshafts (see below). Little more than half of the originally circular pommel has survived. It has two holes; the main one is a result of the removal of the natural soft tissue of the bone shaft's centre, while the horizontal one has been drilled through. The main hole was designed to accept the sword's tang. A grove was incised around the object's centre as a decorative

element – River Waal (NL) (Gerhartl-Witteveen and Hubrecht 1990, Fig. 1); Rheingönheim (DE) (Ulbert 1969a, 44-45; Taf. 32:1, 56:1); Vindonissa (CH) (Fellmann 1966, Abb. 1-3). Pommels of similar proportions can be found in the West. In the Netherlands, two swords are crowned by small round pommels, as is a *gladius* from Pompeii (Gerhartl-Witteveen and Hubrecht 1990, 99, 102, Figs. 3-4; Ulbert 1969b, Taf. 17). The use of bone for hilt assemblages was popular in the early Empire, though such elements were often made of wood or ivory (Bishop and Coulston 1993, 71). At Masada, there is only a single example of wooden grip (see above wooden grip L.1276). Instead, most of the hilt elements are made of bone, and the rest are of ivory.

Dimensions – height: 24mm; maximum width: 24mm; diameter of main hole: 11-12mm; diameter of horizontal hole: 6.5-8mm.

17. Pommel IN 1039-305/3 **PL. III.19O: 1A**

The 'Casemate of the Scrolls' (*Masada* III, 416-422, Plan 36) has yielded a bone pommel, broken in half and badly burnt. It has a horizontal hole piercing the pommel's body. An incised line is decorating the equator of the pommel, connecting the above mention holes. Such line adorns wooden pommels from Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 8-11; p. 15 for parallels).

Dimensions – height: 21.5mm; maximum width: 26.5mm; thickness: 7mm; diameter of main hole: 11-13.5mm; diameter of horizontal hole: 6mm.

Scabbards and scabbard fittings

18. Leather scabbard IN 1244-210 **PL. III.19P**

A unique leather scabbard was unearthed in a rebel dwelling at the western section of casemate wall (*Masada* III, 465, 467, Plans 43-44). Its exceptional state of preservation provides us with rare details about the construction of such items. The scabbard is composed of two elongated trapezoidal – nearly triangular – parts. Originally sewed together, the two parts created a pouch. Stitching holes were pierced along the edges of both parts. The edges were folded inwards and then sewed together. What appears to be the front part, dyed crimson, is decorated by an openwork, netlike pattern, on its lower section. The decoration consists of two series of three vertical orders of narrow rectangular pattern, which flanks an un-pierced vertical band. The lower part of the object is ornamented by an additional order that runs horizontally and defines its layout. As noted above, the lower part of the artefact is straight rather than triangular as one would expect. This shape may have intended to allow the attachment of a metal scabbard chape to the extremity of the leather object.

The netlike motif in openwork technique is characteristic to the Mainz-type scabbards. For example, two elements from a Mainz-type scabbard from Vindonissa (CH), exhibit such a pattern (Unz and Deschler-Erb 1997, Nos. 49, 51).

In the light of this resemblance, this leather object may have adorned a Mainz-type scabbard. This, however, is merely a suggestion, as no similar finds are yet known to exist.

The back part has not preserved as well as the front piece has. Nevertheless it appears to exhibit a much similar cutout netlike design. Unlike the part detailed above, it lacks any traces of colour. In addition there are few more painted fragments which present the remains of the bound seams that fastened both faces to each other.

Several Roman sheathed swords exhibit organic remains, wood as well as leather. However, to the best of our knowledge, merely a single undecorated leather sheath (*vagina*) was unearthed to date Vindonissa (CH) (Gansser-Burckhardt 1942, 73, Abb. 34c).

Dimensions – length (damaged): 102mm; maximum width (damaged): 60mm; thickness: 0.5-1.5mm.

19. Scabbard chape IN 1196-296 **PL. III.19Q: 1**

The bronze chape of a sword sheath was found in a tower room of the southeastern casemate wall. The room was filled with collapse and contained a number of installations from the time of the revolt (*Masada* III, 514-516). The front of the chape is decorated with a delicate cutout design and lightly incised lines, and the back is partially open. There is a hole in the upper edge of the front side to provide for its attachment to a leather-covered wood sheath. Despite the strong chemical treatment the object underwent in the 1960's, traces of tinning are still observable on its reverse side (*ibid.*, 514-517, Plan 50).

The chape is of interest because it belongs to a type of *gladius* sheath found in the Villa of the Mysteries at Pompeii and at Roman sites elsewhere in Europe (Ulbert 1969b; Bishop and Coulston 1993, 71). The bronze, which was originally tinned or silvered, is decorated with delicate cutout designs. The details are incised and would have been gilded. The cutout designs formed either purely ornamental patterns such as vegetal motifs, or depicted figures such as griffons, *tropaia*, gods and soldiers.[51] The dark leather backing would have been visible through the cutout areas and would have created a strong contrast with the silvered and gilded bronze overlay (Ulbert 1969b, 99-102). Like some of the Pompeian-type sheaths, the sides of the chape from Masada terminate in palmettes (such an ornament was uncovered at Masada – see below IN 491-2082/2) (*cf.*: *ibid.*, 114; Pls. 17-19, 26; Brailsford 1962, 1 Nos. A14-A15; Fig. 1).

[51] It is difficult to identity the pattern on the Masada chape, though the symmetry of the design suggests a floral or vegetal motif.

Though the bronze overlays of the sheaths of Pompeian-type are decorated with cutout designs, most of the chapes are not decorated in this manner (Ulbert 1969b, Pls. 17-19). Ulbert illustrates one chape from Rottweil (DE) that is decorated with a cutout pattern (*ibid.*, 125, Fig. 4). This chape closely resembles the Masada piece in size, in the manner of decoration, and in the way the sides terminate in palmettes. Presumably the Masada chape also once had a bulbous tip. However, the chape from Rottweil is angular in form, while that from Masada has straight sides, reflecting a difference in the proportions of the tips of the swords they once held.[52] A closer parallel from Rhine at Mainz (DE) (Bishop and Coulston 1993, 73, Fig. 37:4).

The sheaths with cutout designs are associated with Pompeian-type *gladii*, which date from the reign of Claudius through the time of Domitian (Ulbert 1969b, 118-119; Manning 1985, 152; Lang 1988, 200). Therefore, the chape from Masada was manufactured either shortly before or during the revolt. I would be cautious associating the chape to an Roman officer due to its allegedly elegant construction (Magness 1992, 67).

Dimensions – length: 85mm; maximum width: 33mm; thickness: diameter at top (front to back): 25mm; weight: 24.88 gr.

20. Scabbard chape IN 1186-2385/2 **PL. III.19R: 4**

This tip of a scabbard chape comes from a rebel room in the eastern section of the casemate wall (*Masada* III, 546, Plan 54). It retains a small portion of the U-shaped binding that terminates in a semi-circular tip, decorated by incised lines. Such tips, which adorned sword scabbards, exhibit some variations – Rheingönheim (DE) (Ulbert 1969a, 43, Taf. 31: 4-6 (with references)); Oberstimm (DE) (Schönberger 1978, Taf. 21: B124); Kempten (DE) (Krämer 1957, Taf. B:26). The pattern on our piece, which resembles a flower, is closely paralleled by an object from Aislingen (DE) (Ulbert 1959, 10), and a large group from Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 131-132, 141-147; p. 17 – bibliography).

Dimensions – length (damaged): 29mm; width of binding: 5mm; height of domed tip: 8mm; diameter of domed tip: 12.5mm; thickness of binding: 0.5mm.

21. Decoration of scabbard chape IN 491-2082/2 **PL. III.19R: 3**

This thin copper-alloy object, shaped as a palmette, adorned the mid-upper section of a Pompeian-type sword scabbard. The palmette motif was created by fourteen incised lines. Such ornaments crowned scabbard chapes; complete examples from Pompeii display the

[52] The chape from Masada has the proportions characteristic of Ulbert's 'Pompeian-type', which means that the gladius it held had parallel edges and a relatively short point (Ulbert 1969b, 97-128; Lang 1988, 200; Bishop and Coulston 1993, 71).

exact position (Ulbert 1969b, Taf. 17:1, 3; 19:1b, 2b, 3; for representation see: *ibid.*, Pl. 29). The neatly designed object was originally accompanied by a scroll-like pattern on its base, and was crowned by a loop for its attachment to the scabbard (*ibid.*, 111-115; Abb. 2; Taf. 25). The palmette from Masada, one from Oberstimm (DE) (Schönberger 1978, Taf. 21:B 130), and few palmette decorations from Vindonissa (CH) lack both elements (Unz and Deschler-Erb 1997, Nos. 149, 155).[53]

The Masada piece comes from a courtyard in the western palace, where a 50 cm thick conflagration layer attests to an intense fire. The fire appears to consume a group of objects collected here during the final hours of the revolt (*Masada* III, 295; Plan 17).

Dimensions – length (damaged): 23mm; width: 18.5mm; thickness: 1mm.

22. Ornamental locket of *gladius* IN 334-183/1 **PL. III.19R: 1**

A fragment of a copper-alloy locket that sheathed a Pompeian-type *gladius*, was unearthed in one of the rooms flanking on the east the central courtyard of Residential Building No. IX (*ibid.*, III, 204; Plan 15). The room was constructed during the early stage of the Herodian phase of Masada and under went some minor changes during the revolt.

Though much corroded, the object still reveals the typical decoration of this type: cut-out body parts of figures associated with warfare (such as Mars, Victory *etc.*) (Künzel 1994, 52, Table 4). Unfortunately, due to its poor state of preservation the decorative motif of the punched out openwork cannot be identified (see also its x-ray image). Two parallel copper-alloy bands were horizontally soldered to the upper section of the locket's body. One band has two raised incised perimeters. The other, slightly wider, band exhibits a more elaborate design, which involves in addition to the incised raised perimeters a further raised band that is accompanied by a line of dots. The two bands divide the locket's face into two fields, one of which, as aforesaid, retains the typical voids that consist part of the original decorating scene. Compared with complete examples, the element of two adjacent bands indicates the fragment under discussion is a medial part of the locket (Ulbert 1969b; Künzel 1994, 51-53, Abb. 21; Gerhartel-Witteveen & Hubrecht 1990, 102-3, Fig. 5; Unz and Deschler-Erb 1997, 15, No. 61). Affixed to its rear face are burnt remains of organic substance, seemingly wood, which consisted part of the scabbard body.

Dimensions – 49x79mm (damaged); thickness: 1-1.5mm; upper band: 6.5x32mm; lower band: 8x33.5mm; weight: 15.20 gr.

23. Scabbard mount IN 245-552/1 **PL. III.19Q: 2-3**

[53] More complete examples: Unz and Deschler-Erb 1997, Nos. 150-154, 156-160, 163-164; additional parallels are listed on p. 17.

Scabbard suspension mount with reeded decoration on its upper surface. The mount suffered an impact on its right, which damaged the decoration. The two side loops that accommodated the rings attached to the soldier's belt are now distorted. Similar objects are reported throughout the Roman Empire (Unz and Deschler-Erb 1997, Nos. 78-110; p. 17 – bibliography). See also below, No. 26.

Dimensions – length: 82mm; width: 11mm; thickness: 1mm.

24. Scabbard mount IN 1039-316/14 **(not illustrated)**

A copper-alloy band with four embossed ridges. Four attachment holes are spaced along its deformed body, whose both ends are now missing. Interestingly, the same basket contained a dagger suspension loop (IN 1039-316/9) and silver stud – 'apron' mount? (IN 1039-316/11), discussed below. Embossed mounts are known from Vindonissa (CH) (*ibid.*, Nos. 88, 95, 108-109).

Dimensions – length (damaged): 113mm; width: 13mm; thickness: 0.5mm; diameter of attachment holes: 1-3mm

25. Scabbard mount IN 489-2824 **(not illustrated)**

A massive copper-alloy band with three attachment holes was unearthed in room 489, which served as an entrance room to the Intermediate Wing of the Western Palace (*Masada* III, 294-295, Plan 17). A decoration of four parallel incised lines, along 75mm of the band. Similar ornamenting motif is visible on mounts from Vindonissa (CH), which were assigned by Unz and Deschler-Erb to the scabbards of the Pompeian type (Unz and Deschler-Erb 1997, 111-114; also Nos. 79, 82, 96).

Dimensions – length (damaged): 115mm; width: 12-13mm; thickness: 1mm.

26. Scabbard mount IN 692-114/2-4+5 **PL. III.19R: 2**

Two fragments of the loop of scabbard mount. The face of the mount exhibits two horizontal ridges both of which are notched (**PL. III.19R: 2** – right). An attachment hole is spaced near the beginning of the loop. For parallels, see No. 23.

Dimensions – length (damaged): 34mm; width: 11mm; thickness: 2mm.

27. Dagger scabbard suspension loop IN 523-344 **PL. III.19S: 4**

A suspension loop of a dagger was found in entrance room 523, the side entrance of wing I of the Western Palace (*Masada* III, 282-4, plans 17-18). The loop held a leather thong that attached the scabbard to the belt's frog. Neatly preserved, the elaborate suspension loop is made of copper alloy. It consists of a square sectioned bar that was shaped in the form of

internal scrolls that meet in the centre, much akin to Grew and Griffiths's group D. The bent bar's tips sheath two pins as a decorative element. The bar is secured by two additional pins to the external scrolls, one of which is partly damaged. This embracing element has two projecting parts through which runs a round-sectioned rod that acts as a hinge. A plain flat band is folded over the latter, designed to secure the suspension loop to the dagger's sheath. This was achieved by means of a pin, now lost, whose existence is testified by a hole that pierces the band.

A lavish example of such a set was excavated at Velsen (NL) (Morel and Bosman 1989, 182-183, Figs. 8, 9B). Other examples are reported from Vindonissa (CH) (Unz and Deschler-Erb 1997, 18-19: 209), and the UK (Grew and Griffiths 1991, 50, Nos. 157-162, Fig. 15).

Dimensions – main bar: 23x16mm; thickness of main bar: 2x3mm; Diameter of the decorative pins' heads: 1.5mm; width of external bar (damaged): 27mm; maximum thickness of external bar: 2mm; length of hinge: 15mm; diameter of hinge: 1mm; dimensions of the folded securing band: 10x10mm; dimensions of the unfolded securing band: 18x10mm; diameter of hole in the securing band: 1.5mm.

28. Dagger scabbard suspension loop IN 1039-316/9 **PL. III.19S: 5**

This is a rhomboid section bar that was curled into a scroll design, with the ends fitted to hold studs. It is part of the suspension loop of a *pugio* scabbard (see IN 523-344, for parallels). A method of fastening the loop to the sheath, which did not require soldering, appears on a dagger sheath from northern France (Feugère 1994, 163 (upper right)). Hinges may also have been used on the Masada piece, as it lacks any signs of soldering or riveting. It is worthy noting that the object is not symmetrical, as one of its curls is broader than the other is.

The object originated in L1039 (the so-called 'casemate of the scrolls'), a casemate room that yielded some of the most significant finds from Masada. This locus is taken to be a damping point where culture material of varied sorts was there accumulated during the very last stage of the revolt and the successive months following the Roman conquest of Masada. The *militaria* include shield fragments, a silvered mount, hundreds of *ballista* balls, and several rolling stones (*Masada* III, 416-422, Plan 36; *Masada* II, 18-20).

Dimensions – 17x22mm; thickness: 1-2mm

G. Belt

1. Belt mount IN 1235-499/1 **PL. III.19S: 7**

This is a copper-alloy hinged belt mount covered with thin silver foil. Such mounts were designed to hold the belt buckle. Three grooves were cut in the plate's narrow edge, which

was then folded to create a loop for the buckle's pin (Unz and Deschler-Erb 1997, Nos. 1045-1058, 34-6, Pl. 41). Four holes in the mount's corners were used for its attachment to the leather belt. Two of three spike-like corroded elements undoubtedly represent the remains of the attachment pins. The third element, located next to the attachment hole, seems to be the corroded negative of a lost pin. The reverse side of the plate is very corroded. Its front face was similarly preserved until a mechanical cleaning indicated that it was plated with thin silver foil. The silver-plated, hinged mount is well-paralleled by the one buckle mount and two frog mounts of the splendid Velsen set (NL) (Morel and Bosman 1989, 180-181: C1-C3; Figs. 5: 1-3, 6: 1-3). Silvering and tinning were popular among Roman soldiers (Bishop and Coulston 1993, 96, 191-192).[54] This is attested by Pliny the Elder, who refers to silver tabs that decorated soldiers' belts (*NH* 33.54.152).[55] From the sources we also learn that silvered mounted belts not only had decorative value, but also could used as a substitute for money (Tacitus, *Hist.* 1.57). The Masada mount comes from a rebel complex adjacent to swimming pool L711 in the southern part of the site (*Masada* III, 479, Plan 45).

Dimensions – width of plate: 28-29.5mm; length of plate: 58mm; thickness of plate: 2mm; width of hinge: 8-10mm; length of hinge: 30mm; diameter of hole 2.5mm; height of corroded pin: 3mm.

2. Belt buckle-tongue IN 1271-1252/1[56] **PL. III.19S: 9**

This is a tongue of fleur-de-lis type. Decorated with a punched design, the tongue has a looped hinge and stepped tip. Such tongues are associated with the scrolled decorated buckle that is regarded as a typical military type. Parallels to this popular item include examples with tongues from Kalkriese (DE) (Franzius 1995, Abb. 8: 6), Kempten (DE) (Krämer 1957, Taf. B: 18), Verulamium (UK) (Frere 1984, Fig. 13: 96), Camerton (UK) (Jackson 1990, 32: 48-49, Pl. 5).

Dimensions – length: 40mm; width: 18mm; maximum thickness: 3.5mm; diameter of loop: 3mm.

3. Belt buckle-tongue IN 1039-1631 **PL. III.19S: 8**

This is a tongue of fleur-de-lis type. It has an asymmetrical body whose tip is adorned with a circular terminal. A close parallel is published from Kalkriese (DE) (Franzius 1995, Abb. 8: 9; parallels with bibliography: Unz and Deschler-Erb 1997, 37, Nos. 1186-1188). This object

[54] For examples of silver plated belt mounts *cf.* Velsen (Morel and Bosman 1989, C4-C8), Kalkriese (Germany): Franzius 1995, Abb. 8: 10.
[55] 'baltea lamnis crepitent...'
[56] L1271 is not included in the final report: *Masada* III.

comes from L1039 (the 'casemate of the scrolls'), which yielded numerous *militaria* (*Masada* III, 416-422, Plan 36; *Masada* II, 18-20).

Dimensions – length: 37.5mm; maximum width: 24mm; thickness: 3mm; thickness of loop: 2mm; diameter of loop (external): 6.5mm; diameter of loop (internal): 3.5mm; weight: 3.23 gr.

4. Silvered stud – 'apron' mount (?) IN 1039-316/11 **PL. III.19S: 6**

This is a circular copper-alloy stud whose upper face was silver plated.[57] A short conical spike protrudes from the centre of the flat rear face, on which two blurred concentric circles are visible. Similar objects have been identified in the Roman West as 'apron' mounts (Camerton (UK) (Jackson 1990, 30; Nos. 32-36; Pl. 4); Rheingönheim (DE) (Ulbert 1969a, 42; Taf. 29:27-37 (with references)). One of the most extravagant pieces of equipment of the Roman soldier, during the Julio-Claudian period the 'apron' consisted of three to eight straps suspended from the soldier's belt (Grew and Griffiths 1991, 52-53; Bishop 1992, 81-104). A variety of circular and rectangular mounts fastened to the straps were often richly decorated. Various patterns in silver and niello are known (*ibid.*). The popularity of silver among the Roman *militis* is well-attested (Bishop and Coulston 1993, 97, 191-192).

Nevertheless, the identification of this stud as an 'apron' mount is not definite. This is because silvered studs adorned other types of military equipment. For example, a *gladius* sheath from Pompeii (AD79) was decorated with eleven pairs of silvered studs (Ulbert 1969b, Taf. 17: 2; 18: 2a; 19: 2b). The tombstone of Caius of the *legio II Adiutrix* from Aquincum (Budapest) portrays a baldric ornamented with similar circular mounts (Robinson 1975, Pl. 470). These examples indicate that such studs could have been fastened to various military objects, including sword sheaths, baldrics, and horse harnesses. The stud from Masada, found alone, should therefore be identified simply as the decorative element of military object.

Dimensions – diameter of stud's head: 26mm; thickness of head: 1.5mm; length of spike: 7.5mm; thickness of stud: 1-3mm.

Frogs

Copper-alloy frogs

5. Copper-alloy frog **PL. III.19R: 5C**

Site:.....Masada
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.176; B.715 (IAA No.: 93-1958)
Material:.....Copper alloy
Dimensions –

[57] Found in the 'casemate of the scrolls' (*Masada* III, 416-422, Plan 36; *Masada* II, 18-20).

Length:.....38mm
Diameter of head:.....26mm
Thickness of head:.....2mm
Shank:.....28mm
Thickness of shank:...4mm

Frog with triangular shank. The upper face of the head is decorated by three concentric rings. For copper-alloy frogs in Palestine, see: Vol. I, pp. 127-129. In the West: Wild 1970, Type Va.

6. Copper-alloy frog **PL. III.19R: 5B**
Site:.....Masada
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.1270; B.1047/2 (IAA No. 93-1960)
Material:.....Copper alloy
Dimensions –
Length:.....36mm
Diameter of head:.....23mm
Thickness of head:.....2mm
Shank:.....27mm
Thickness of shank:...3mm

Frog with triangular shank. Near complete, shank is broken. Head is decorated by four raised concentric rings. For parallels: see previous item.

7. Copper-alloy frog
Site:.....Masada **PL. III.19R: 5E**
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.1035; B.30/10
Material:.....Copper alloy
Dimensions –
Length:.....36mm
Diameter of head:.....24mm
Thickness of head:.....2mm
Shank:.....26mm
Thickness of shank:...3mm

Frog with triangular shank. Complete. The head feature four raised concentric rings. For parallels: see No. 6.

8. Copper-alloy frog **PL. III.19R: 7**
Site:.....Masada
Provenance:.....Casemate room
Expedition:.....Yadin (1963-1965)
Excavation No.:...L. 1180; B. 2278/1
Material:.....Copper alloy
Dimensions –
Length:.....30mm+
Thickness of head:.....1.5mm
Shank (bent):.....29mm
Thickness of shank:...3mm

Frog with triangular shank. Damaged. Most of the head is missing. Four concentric raised rings adorn the head. For parallels: see No. 6.

9. Copper-alloy frog **PL. III.19R: 5D**
Site:.....Masada
Provenance:.....Rebel occupation
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.1047; B.550/5
Material:.....Copper alloy
Dimensions –
Length:.....38mm
Diameter of head:.....24mm
Thickness of head:.....2mm
Shank:.....29mm
Thickness of shank:...3mm

Frog with triangular shank. Complete. The head exhibits three raised concentric rings. For parallels: see No. 6. The frog was seemingly uncovered above a floor from the time of the revolt (*Masada* III, 399-401). It seals a cave from the Herodian period that came to ruin in the earthquake of 31BC, and was recently excavated by our expedition.

10. Copper-alloy frog **PL. III.19S: 1A**
Site:.....Masada
Provenance:.....Casemate
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.1139; B. 2252
Material:.....Copper alloy
Dimensions –
Length:.....27mm+
Diameter of head:.....24mm
Shank:.....23mm+

Frog with triangular shank. Damaged. The triangular part of the shank is missing and the perimeter of the head is chipped. The cast head exhibits three concentric raised rings. For parallels: see No. 6. The object was found in a casemate room in the southeastern section of the wall that was occupied by the rebels (*ibid.*, 534-535, Plan 53).

11. Copper-alloy frog **PL. III.19S: 1B**
Site:.....Masada
Provenance:.....Courtyard
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.92; B. 255
Material:.....Copper alloy
Dimensions –
Diameter of head:...~24mm

Fragmentary frog with a triangular shank. Badly damaged. Large part of the shank and half of the head are missing. The cast head exhibits two concentric raised rings. For parallels: see No. 6. For L. 92: *ibid.*, 112-114, Plans 2-3.

12. Copper-alloy frog **PL. III.19R: 5G**
Site:.....Masada
Provenance:.....Room (Building VII)
Expedition:.....Yadin (1963-1965)
Excavation No.:...156-477 (IAA No. 93-1959)
Material:.....Copper alloy
Dimensions –
Length:.....34mm
Diameter of head:.....24mm
Diameter of shank's loop:...16mm

Frog with looped shank. The head is decorated by two concentric raised rings. A similar item is reported from Camp F, west of Masada (III.20/G.1) and Kh. Qumran (III.17/G.2). See: Vol. I, pp. 127-129. The object was unearthed in a small room of Building VII, which was occupied during the revolt but possibly also by Roman soldiers, following the conquest of Masada (*ibid.*, 9, Plan 8, and note 13).

13. Copper-alloy frog **PL. III.19R: 6**
Site:.....Masada
Provenance:.....'Tannery' – tower in casemate wall
Expedition:.....Yadin (1963-1965)
Excavation No.:...L.1276; B.1915/6
Material:.....Copper alloy
Dimensions –
Length:.....30mm
Diameter of head:.....19mm
Shank:.....25mm
Thickness of shank:...1-2.5mm

Slightly pointed dome-head frog with a looped shank. For parallels: Augusta Raurica (CH) (Deschler-Erb 1999, Nos. 791-797, Taf. 41). See previous item. The frog was uncovered in tower room 1276 (*ibid.*, 440-445, Plans 17, 40), which yielded many shield fragments, buckle hinge plate (III.19/B.7) and a wooden handgrip.

Bone frogs

14. Bone frog **PL. III.19S: 2A**
Site:.....Masada
Provenance:.....Casmate
Expedition:.....Yadin (1963-1965)
Excavation No.:...1250-897 (IAA No.: 93-747)
Material:.....Bone
Dimensions –
Length:.....35mm
Diameter of head:....20mm
Width of shank:.....20mm

Complete. Circular flat head has three concentric raised rings, presumably following the design of the metal specimen. The triangular shank is pierced by semi-circular fastening hole. In Palestine, parallels are known in Jerusalem (III.12/G.2) and Gamala (III.3/G.3). It was

found in a casemate room that was inhabited during the revolt (*ibid.*, 458-459, Plan 42). Another example was found in the room to the north L1251 (see next item.)

15. Bone frog **PL. III.19S: 2F**
Site:.....Masada
Provenance:.....Casemate
Expedition:.....Yadin (1963-1965)
Excavation No.:...1251-896
Material:.....Bone
Dimensions –
Length:.....21mm+
Diameter of head:...16mm
Width of shank:.....13mm+
Length of shank:.....14mm+

Similar to previous item. The shank is broken. It seemingly had a circular central hole. The object was found in casemate room 1251 that had been inhabited by the rebels (*ibid.*, 457, Plan 42).

16. Bone frog **PL. III.19S: 2B**
Site:.....Masada
Provenance:.....Casemate
Expedition:.....Yadin (1963-1965)
Excavation No.:...1134-2491 (IAA No. 93-746)
Material:.....Bone
Dimensions –
Length:.....26mm
Diameter of head:...15mm
Width of shank:.....17mm
Length of shank:.....17mm
Circular hole:.....5mm
Height:.....9mm

Complete. Circular dome head with raised perimeter and central hole. Its triangular shank is pierced by a small circular fastening hole. A line is incised through the shanks width and the hole's centre. For parallels see No. 14. The frog was unearthed in Casemate 1134 (ibid., 544, 546, Plans 54-55). The east part of the room slid down the slopes and part of the stones were seemingly plundered by the Byzantine monks for the construction of the walls around cistern 1907.

17. Bone frog **PL. III.19S: 2E**
Site:.....Masada
Provenance:.....Courtyard
Expedition:.....Yadin (1963-1965)
Excavation No.:...242-309 (IAA No.: 93-745)
Material:.....Bone
Dimensions –
Length:.....29mm
Diameter of head:...16mm
Width of shank:.....19mm

Complete. Circular dome head with three raised concentric rings. The triangular shank is pierced by a semi-circular fastening hole. An oblique line is incised along the shanks width near adjacent to the round part of the hole. For parallels see No. 14. The fitting was found in the courtyard leading to Tower 233 (*ibid.*, 181, Plans 1-2).

18. Bone frog **PL. III.19S: 2D**
Site:.....Masada
Provenance:.....Room (Building IX)
Expedition:.....Yadin (1963-1965)
Excavation No.:...326-242
Material:.....Bone
Dimensions –
Length:.....26mm
Diameter of head:...16mm
Width of shank:.....19mm

Near complete, damaged head. The circular dome head has three raised concentric rings. Its triangular shank is pierced by a semi-circular fastening hole. For parallels see No. 14. The frog was found in rebel layer in room 326 – central room of unit VI of Building IX (*ibid.*, 215-216, Plan 15).

19. Bone frog **PL. III.19S: 3B**
Site:.....Masada
Provenance:.....Cistern
Expedition:.....Yadin (1963-1965)
Excavation No.:...1063-1711/1
Material:.....Bone

Broken, only the shank with a circular hole has survived. For parallels see No. 14. The fitting was uncovered in Cistern 1063, seemingly originated in the casemate 1062 that was built over the cistern (*ibid.*, 390-391, Plans 1, 34).

20. Bone frog **PL. III.19S: 3A**
Site:.....Masada
Provenance:.....Room, Western Palace
Expedition:.....Yadin (1963-1965)
Excavation No.:...464-957/1
Material:.....Bone
Dimensions –
Length:.....31mm
Diameter of head:...19mm
Width of shank:.....*c.* 20mm

One of a pair of bone frogs that were found in this locus – see next item. Damaged. Circular flat head with defined perimeter and central hole. The wide part of the triangular shank is broken. For parallels see No. 14. Room 464 is an anteroom to room 465, north of the open reception room 521 in the core of the Western Palace (*ibid.*, 243-244, Plans 17-18).

21. Bone frog **PL. III.19S: 2C**

Site:.....Masada
Provenance:.....Room, Western Palace
Expedition:.....Yadin (1963-1965)
Excavation No.:...464-957/2
Material:.....Bone
Dimensions –
Length:.....24mm+
Width of shank:.....18mm

Part of a pair of frogs – see previous item. Damaged. Only the triangular hank has survived. It has a semi-circular fastening hole. For parallels see No. 14.

H. Shafted weapons

Spears

1. Spearhead IN 1118-1362 **PL. III.19T: 1-2**

Iron socketed spearhead. The blade is much damaged. The leaf-shape head has a mid-rib. The lower part of the socket is damaged. The object was uncovered in a tower room in the eastern section of the casemate wall (*Masada* III, 548, Plan 55). A cheeckpiece of a cavalry helmet was uncovered in this locus (III.19/A.1).

Dimensions – length: 246mm+; length of head: 110mm; width of head: 23mm+; Diameter of socket: 12-20mm.

2. Spearhead IN 1041-1305 **PL. III.19T: 3**

Iron tanged spearhead. The head has a very prominent mid-rib with short flanges. The head was uncovered in the first casemate room south of the synagogue (*Masada* III, 413-414, 416, Plans 34-36). The room was inhabited during the revolt and exhibits clear signs of a post-revolt presence. A harness pendant was found in the locus (III.19/Q.3).

Dimensions – length: 90mm; length of head: 60mm; width: 21mm; thickness: 9mm

Spear-butts (ferrules)

3. Spear-butt IN 1110-1505 **PL. III.19T: 5**

Iron ferrule. It exhibits an open socket with a square attachment hole. The circular socket tapers to a square-sectioned point. A similar object from Augusta Raurica (CH) was published as a socketed *pilum* head (Deschler-Erb 1999, No. 51, Taf. 4). It was found in a tower room in the Eastern section of the casemate wall that was inhabited during the time of the revolt (*Masada* III, 552-553, Plan 56). This room yielded also a buckle hinge plate (III.19/B.6).

Dimensions – length: 149mm; width of socket: 25mm; thickness of socket: 3-5mm; point: 10x10mm; hole: 7x7mm.

4. Spear-butt ? IN 1159-1520 **PL. III.19T: 4**

Iron socketed object. It exhibits a leaf-shaped flat blade and a broken elliptical socket. Despite its resemblance to a spear head, the blunt edges of the blade-like feature appears to negate this identification. It was found in a room that formed part in a cluster of rooms nicknamed the "transit camp", dated to the period of the revolt (*ibid.*, 525, Plan 52).

Dimensions – length: 93mm; width of blade: 21mm; width of socket: 14mm; thickness of blade: 22mm.

I. Archery

Bow

1. Bow ear-lath IN 162-146 **PL. III.19U: B**

Complete, bone ear lath. The DNA of the object was extracted and successfully identified as that of an *Ibex*, which was endemic during the classical periods to southern and eastern Israel, Jordan and southern Syria (Appendix I – 1.1). Two more fragments were found at Masada (see below). A grip lath was uncovered at Wadi Murabba'ât Caves (V.16/I.1). Additional pair from the Byzantine period was found at Nessana (IL) (Colt 1962, 52, Pl. XXI: 27). The ear-lath was uncovered in Room 162, in the cistern under which, were further found some 400 scales (*ibid.*, 24-25, Plan 1).

Dimensions – length: 150mm; width: 11-16mm; thickness: 3mm; notch: 5mm.

2. Bow ear-lath IN 233-1857 **PL. III.19U: A**

Bone ear lath. Its curving proximal end is broken, possibly the next fragment. For parallels, see previous item. The irregular room is situated in the Eastern section of the Casemate wall, embracing the eastern wall of Building VIII. It was in use during the revolt (*ibid.*, 569-571, Plan 2). The room yielded a handle and a *phalera* (233-1911/6).

Dimensions – length: 142mm+; width: 14-18mm; thickness: 5mm; notch: 6mm.

3. Bow ear-lath (unknown origin) **PL. III.19U: C**

Fragment of proximal end of ear-lath. Possibly part of the same lath as the previous item.

Q. Riding equipment

1. Junction loop and ring junction IN 1156-1230/2 **PL. III.19Y: 4**

The intact junction loop still retains its ring junction. This find is of particular interest, since the two fittings are usually found separately (Bishop 1988, 102-103). The object is made of a copper-alloy strap that has been folded over to create a loop that held the ring. The front part of the strap has a semi-hemispherical section decorated with three horizontal prominent ribs. A pin soldered to the back of the front part was originally riveted to the back plate through a leather strap. An identical junction loop was found at Risstissen (DE) (Bishop's type 4b), of

which only the upper plate has survived (Ulbert 1959, 72-73; Taf. 62: 13). The Risstissen example is slightly longer and wider, but is otherwise remarkably similar. Given the similarity in style and dimensions on one hand and the rarity of this sub-type on the other (only these two examples are known), it is possible that they come from the same workshop.

The object's place on the harness may be determined on the basis of the size of the ring. Rings with an external diameter of 30-50mm are believed to have served as harness junctions. Smaller rings were presumably junctions of bridles or reins (Bishop 1988, 94). Hence, the object under discussion seems to represent the latter. This unique object comes from tower room L1156, which is called the 'Josephus' room because three impressions of that name in Latin were stamped on its south wall (*Masada* III, 527-529; on the stamp see *Masada* II, 211, Pl. 44: 936).

Dimensions – weight: 9.09 gr.; thickness of ring: 2-4mm; inner diameter of ring: 20-21mm; external diameter of ring: 25-26mm; length of body (upper part): 31.75mm; width of body (upper part): 7mm; maximum thickness (upper part): 3.5mm; length of body (lower part): 33.5mm; width of body (lower part): 6mm; thickness of body (lower part): 1mm; length of pin: 6mm; thickness of pin: 2-3mm.

2. Junction *phalera* IN 360-645 **PL. III.19Y: 3**

This circular cast copper-alloy disc with four peripheral rings represents a junction *phalera*. The slightly convex *phalera* has a domed centre. The circular boss and the *phalera*'s perimeter were emphasised by incised circles. The object comes from a two-room unit that was part of a complex added to the west of Building IX during the time of the revolt or later. An additional harness fitting – a neatly decorated *phalera* – was found in an adjacent courtyard (IN 311-407/1) (*Masada* III, 229; Plan 15).

The external four-loop *phalera* belongs to Bishop's *phalerae* Functional Type 5a (Table 5 and Fig. 42). This rare type is known as early as the Augustan period (Oberaden (DE) (Albrecht 1942, Taf. 47: 5-6); Kempten (DE) (Krämer 1957, Taf. B: 23), and reappeared in the late 1st century to mid-2nd century AD (Newstead (UK) – Curle 1911, Pl. LXXIV: 6). The late examples are notable for their large dimensions, more than double those of the Augustan examples. On the basis of the criterion of size, the Masada piece belongs to the early group, although its domed centre cast as one piece with the *phalera* is found on the later four-loop *phalerae*. However, the Newstead (UK) *phalera* has a domed stud that was riveted in its centre. One of the equally spaced peripheral rings on the Masada piece was found detached from the main body. The same phenomenon was observed on the *phalera* from Newstead mentioned above. This kind of damage is typical of other harness looped articles (such as junction loops), mainly as a result of metal fatigue (Bishop 1988, 102).

Dimensions – weight: 12.08gr; height: 14mm; width: 58mm; maximum diameter of round body: 36.5mm; thickness of round body: 2mm; thickness of rings: 2-3mm; inner diameter of rings: 6.5-7mm; external diameter of rings: 11-12mm.

3. Harness decoration IN 311-407/1 **PL. III.19X: 2**

A richly decorated circular copper-alloy *phalera*. Its front face has a flat, narrow border with a convex middle section surrounding a concave centre. The reverse face has a flat border with a concave middle section surrounding a flat centre. A hole was pierced through the centre of the *phalera*. Each side of the reverse face has a soldered rivet, placed horizontally on the same axis as the central hole. A small hinge made of two parallel loops was soldered at the bottom of the rear face. The *phalera* was fastened to a leather strap by a rivet through the hole in the disc's centre. The two reverse rivets secured the attachment. The Masada object is a variant of Bishop's two-loop *phalerae* (*ibid.*, 95). The use of two rivets for attachment is attested on a *phalera* from Alesia (Musée Alesia 2627, FR) (Rabeisen 1990, 78; Fig. 4: 4). The front face of the Masada piece is richly decorated with inlaid niello designs. These consist of a combination of three dots and a wavy line that repeats alternately four times at regular intervals on the frontal convex part. Two more inlaid niello wavy designs decorate the central hole. These somewhat abstract elements, which symbolise viticulture, are common on harness fittings of the 1st century AD (Brouwer 1982, 149; Abb. 4; Bishop 1987, 118; Bishop 1988, 115). The three dots motif represents a cluster of grapes, while the wavy line should be interpreted as a vine or tendril. Bacchic motifs are also attested on other harness fittings (see below, pendants IN 1173-2199/1 and IN 1138-1354/3). The Masada object comes from a courtyard and room built during the revolt and in the post-revolt period (*Masada* III, 229, Plan 15). A few *militaria* were found in the adjacent rooms (see IN 360-645, 324-57/2, 310-250).

Dimensions – maximum diameter: 32mm; height: 4mm; diameter of hole: 2.75mm; thickness of hinges: 4mm; width of hinges 6.5mm; height of hinges: 7mm; diameter of hinge holes: 3mm; diameter of pins: 4-1.5mm, 4.5-2mm; height of pins: 5.5mm.

4. Harness decoration IN 1173-2199/1 **PL. III.19Y: 1**

A richly decorated copper-alloy *phalera* with traces of silver plating comes from a rebel unit annexed to tower room L1138 in the eastern casemate wall. Additional harness fitting was found in the latter (IN 1138-1354/3) (*ibid.*, 537-539, Plan 53). The perimeter of the object's upper face is slightly raised, the middle part is convex, and the centre is concave. The rear face is too corroded to determine its original form. The edges of the object have suffered damage, and three sections and part of the central hole are missing. Elaborate patterns are incised on *phalera*'s frontal face. These consist of grapes, tendrils, and vine leaves arranged

on the convex perimeter, and six petals incised around the central hole. Numerous examples of motifs associated with viticulture are attested on harness fittings throughout the Roman world, including two from Masada (IN 1138-1354/3, 311-407/1). The upper part of the Masada piece was plated with a silver foil, most of which has disappeared. The incised details were presumably inlaid with niello that has not survived. Traces of the underlying solder are still visible, especially in the centre. The use of silver instead of tin is generally associated with harness elements, whereas tin was favoured for infantry equipment, especially belt mounts (Bishop 1987, 115). The object under discussion appears to strengthen this notion. However, the fact that one of the belt mounts from Masada (IN 1235-799/1) is silver-plated suggests that this rule may not always apply to equipment in the Roman East.
Dimensions – diameter: 46mm; height: 6mm (damaged); diameter of hole: 5mm; thickness of perimeter: 2mm.

5. Harness decoration IN 324-57/2 **PL. III.19Y: 2**

The circular disc, which is perforated in its concave centre and has a convex perimeter, comes from a rebel context in Building IX, which was a residential building during Herod's time (*Masada* III, 214; Plan 15). As noted above, three military objects were excavated in the immediate vicinity (IN 360-645, 310-250 and 311-407/1). The frontal face of the *phalera* is decorated with two concentric circles. The strap was attached to the *phalera* by a rivet through the hole. This object appears to belong to Bishop's Functional Type 2h (Bishop 1987, Fig. 41). Such *phalerae* were probably intended for decorative rather than functional purposes. They presumably adorned the harness, as can be seen in Bishop's reconstruction of a Flavian parade harness (*ibid.*, Figs. 30-31).
Dimensions – diameter: 44mm; height: 6mm; diameter of hole: 6mm; thickness: 1mm; diameter of large decoration circle: 28mm; diameter of small decoration circle: 26mm.

6. Harness decoration IN 1138-1354/3 **PL. III.19X: 3**

A copper-alloy oakleaf-shaped pendant with acorn terminals. It comes from tower room L1138, in front of which a harness decoration was found (IN 1173-2199/1) (*Masada* III, 536-537; Plan 53). This pendant belongs to a very common type of harness pendants. Its main body is of teardrop shape, with an acorn-tipped terminal and two more stylised acorn terminals attached to its sides. Two semi-hemispherical holes are cut obliquely into its centre. Two eyes are fitted into the two side terminals. Traces of the pendant's suspending neck are visible on the mid-upper edge (Bishop's Type 1K). The frontal face of the pendant is densely filled with punched floral motifs. These include tendrils and grapevine or ivy leaf designs arranged symmetrically on the slightly convex body. The *punctim* technique, used for these designs, was popular during the pre-Flavian period, and was used on other types of harness

fittings, including the 'Bird-Headed' or 'winged' pendants (Bishop's pendant Type 7). This technique was also used in the decoration of a belt buckle-pin from Masada (IN 1271-1252/1). The symbolism of the Masada pendant is expressed by its shape and decoration (Bishop 1988, 118). The same combination of oakleaf, acorn, and viticulture motifs is common in the West, notably at Xanten (DE) (Jenkins 1985, Figs. 2, 3, 7, 10) and Doorwerth (NL) (Brouwer 1982, Abb. 4). A fine example from the East was uncovered at Nawa (SY) (Abdul-Hak 1954-5, 187-188, Pl. IX: 1-2). The viniculture designs, as attested also above (pendant 311-407/1) derive from the Bacchic world of images, which is associated with horses (Bishop and Coulston 1993, 105).

Dimensions – maximum length: 63.5mm; length of main body (excluding the broken loop): 62.5mm; maximum width: 50.5mm; maximum thickness: 3mm; weight: 30.45 gr.

7. Harness decoration IN 1052-1325 **PL. III.19X: 4**

A copper-alloy teardrop-shaped pendant. The flat-faced pendant has a suspending neck, now partly missing, and a knobbed biconical terminal topped with a prominent horizontal rib. Such pendants suspended from *phalerae*, while smaller examples functioned as an inter-pendant for the luna pendant. Numerous examples have been published from the Western Empire (Bishop's type 8f. Strasbourg (Forrer 1927, Taf. LXXXVII: 14)). In the symbolic world of the Roman cavalryman, lunate pendants represented the luna, and together with the round *phalera*, symbolised the eternal couple – the moon and the sun, femininity and masculinity. This popular design may also have been intended to protect the horse from evil forces (Bishop 1988, 108). The Masada object was found in a space to the east of and adjacent to the 'casemate of the scrolls' (L1039; see above) (*Masada* III, 423-424; Plan 36), in which were also uncovered a lobate hinge (III.19/B.1), two knives[58] and some 90 *ballista* balls.

Dimensions – total length: 44mm; length of broken neck: 6.5mm; maximum width: 24.5mm; width of neck: 4mm; thickness of terminal: 5mm; width of terminal: 4mm.

8. Harness decoration IN 811-86/2 **(not illustrated)**

This is a heart-shaped pendant with a domed head rivet in its upper centre. Two small triangular like coves are located in the middle of the object's sides. A close parallel to this shape is published from Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 1481). The tip of the pendant is now lost, as is the attachment loop. Rivets are sometimes found fastened to the frontal face of the pendant.[59] They may have been intended to secure the pendant to a leather backing. The Masada pendant comes from an annex to Building XIII that had clear evidences for rebel occupation (*Masada* III, 351; Plan 24).

[58] Not a sword as was noted in the report.

[59] For securing rivets on harness pendants *cf.* Unz and Deschler-Erb 1997, Nos. 1341, 1352, 1468, 1480.

Dimensions – length (damaged): 27mm; maximum width: 29mm; thickness: 1mm; diameter of rivet's head: 7.5mm.

9. Harness pendant **PL. III.19X: 5**

Provenance:.....Storeroom
Expedition:.....Yadin (1963-1965)
Excavation No.:...145-1315/1
Material:.....Copper alloy
Dimensions –
Length:.....25mm
Width:.....21mm
Thickness:...1.5mm (terminal: 3mm)

The small lunate pendent has lost most of its loop and one terminal is now missing. A hole occupies the pendant's centre, was intended to hold a round inner pendant. A *gladius Hispaniensis* was uncovered in this locus as well (Vol. I, pp. 107-109).

10. Fragmented leather Harness **PL. III.19X: 1**

The Roman harness, much influenced by the Celtic model, was a system of straps that met at four to five 'junctions' (Bishop 1988, 105-108, Fig. 27). The girth strap that held the saddle passed under the mount's belly (*infra* Q.4.3), while straps that extended round its breast and tail (crupper) prevented the saddle from slipping. Two pairs of haunch and shoulder junctions, spaced under the mount's shoulder line, are composed of these straps and the haunch and shoulder straps that pass towards the saddle.

The only remains of leather straps of horse harness from the principate were uncovered at Masada (III.19/Q.9). To date straps have been preserved as corrosion products on the back of pendants (Xanten (DE): Jenkins 1985, 148, Pl. X, B; Bishop and Coulston 1993, 105). The harness remains, presumably of a mount that served the rebels community, were found in the 'Southern fort' of Masada (**PL. III.19X: 1**; L1216: *Masada* III, 490-491). Mounts were held in this room that seemingly functioned as some sort of a stable, as is attested by the dung layer that covered most of the floor. The harness remains consist of four fragmentary leather straps, each pair of which is attached to an iron ring. Leather bands were folded along their axis and had their edges sewn together (13-14mm wide). A simple seam runs through slits 2mm long that are spaced 4mm apart. The ends of the straps were bound by short leather bands (100mm long), which formed a loop around the iron rings (diameter of 40-41mm and 4-5mm thick). The bands were secured by a thin leather thread that stitched through the four layers of the strap looped end (5-6mm wide). The fact that both rings were joined by two straps each, may be interpreted as representing a simple form of parallel junctions. Ring junctions of the 1st century AD are commonly reported from the West (Bishop 1988, 94 and Table 4; for reconstruction Bishop 1988, Fig. 29). If indeed so, the ring junctions from Masada are the first ferrous examples as in all cases the rings are made of copper alloy (see

also the ring junction from Masada – III.19/Q.1). Nonetheless, the iron rings may have been part of a bit to which the bridle's cheekpiece straps and reins were attached. The small dimensions (25-26mm) of the ring junction from Masada (III.19/Q.1) seemingly suggest it belonged to either bridle or reins.

11. Horseshoe (not illustrated)

An iron horseshoe was uncovered in the upper layer of the sediment that filled the small water cistern 1216 at the southwestern section of the site during our recent excavations (*Masada* III, 490-491). The horseshoe is currently under going conservation treatment. It exhibits a simple U-shape structure with square fastening holes that are spaced along its body.

12. Harness pendant IN 333-459/6 **PL. III.19Z: 1**

Circular *phalera*, only half of which has survived. The upper face of the object is decorated by incised lines, seemingly representing the petals. It was found in a small room of Unit II of Building IX (*Masada* III, 206, Plan 15). The room was occupied during the revolt.

Diameter: 33mm; Diameter of central hole: 5mm.

13. Harness pendant IN 233-1911/6 **PL. III.19Z: 2**

A circular *phalera*, domed center with flange and damaged perimeter.

T. Ritual artefacts

1-2. Amulets of Isis and Harpocrates **PL. III.19Z: 3-4**

A pair of copper-alloy amulets were found at Masada. Featuring the images of *Isis* and *Harpocrates*, the original owners of the objects were definitely not rebels. The two amulets were found in two adjacent units, in the southeastern section of the Casemate Wall, that were inhabited by the rebels (*Isis*: L1139-2256/1; *Masada* III, 534-535, Plan 53. *Harpocrates*: L1180-23/5; *ibid.*, 536, Plan 53). It is thus more likely that the objects belonged to the slain soldiers of Garrison A, and were looted by members of the *sicarii* party. According to the Jewish ruling, an intentional mutilation of the amulets would have purified them, however, the corded condition of the objects does not allow us to determine whether this procedure has occurred.

Amulets are reported, for example, from Holland (Zadok-Josephus, Petters and Witteveen 1973, 49, Nos. 68-69) and Britain (Pitts 1979, 9, 77-78, No. 133, Pl. 23). The coupling of *Isis* and *Harpocrates* is not occasional, since following the Egyptian tradition the presence of a young god as a consort to *Isis* was required. The warship of the Egyptian goddess was very popular amongst the Roman army. Further evidence to the popularity of *Isis* is to be found in a silver pendant, presumably of *Isis*, that was discovered at Horvat Midras (V.12/T.1) (Kloner and Tepper 1987, 355, Figs. 160: 21, 168). Like the two amulets from Masada it may have

originally belonged to a Roman soldier as well. A bust of *Isis* fasten to a circular *phalera*, from Requemaure (FR) was identified as a military decoration (Feugère and Barberan 1997).

3. Pendant IN 1041-1564/4 **PL. III.19Z: 5**

The flat face of the copper-alloy item exhibits five stars that were incised on the background of a stylised image of the sun; hence representing the five planets of the solar system, known in ancient times: Mercury, Venus, Mars, Jupiter and Saturn. Along with the sun that was considered as a planet and the moon, they formed the 'seven planets' of ancient times. The planetary scene clearly dictates that this item was in the possession of a Roman soldier and as objects with the pattern of the sun, moon or dragon fell under the category of one the strictest religious prohibitions regarding idolatry (AZ 3.3).[60] The pendent was discovered in a room that was originally part of the Herodian casemate wall and under went changes during the time of the revolt, including the construction of several installations. Clear signs of a post-revolt presence are evident in the room (*Masada* III, 413-414, 416). A spearhead was uncovered in this locus (III.19/H.2).

[60] See also T AZ 5:1; BT AZ 42_b; PT AZ 3, 42_b. The 'seven planets' motive deserves further consideration, as it appears to be far more popular than has been previously realized. Many Hellenistic coins exhibit repeating motif of concentric circles, some with star in their centre, which are spaced along the coins' perimeters. (Bar-Kochva, 1985, 20). The traditional interpretation of this combination is merely referred to as concentric circle's halves, whose centres were decorated by a star. Yet, when examined the objects exhibit seven such combinations, presumably associating with the theme of 'seven planets'. If indeed so, the circles may be representing the orbits of the stars.

III.20 – Roman siege camps, Masada

PL. III.20-III.20E

The fortress of Masada came under siege in AD73/74. The Roman force deployed around the site (*BJ* 7.252, 274-276, 303ff.). The siege system comprises of eight camps, a siege-wall and an equipment compound ('Bauplatz') (**PL. III.20: 1**). It seemingly further involved the construction of a pass connecting the eastern and western sectors. The attack effort focused in the west, where the topographical conditions were relatively less harsh. The system was subject for several surveys, excavations and studies (Hawkes 1929; Schulten 1933; Richmond 1962; Gutman 1964; Roth 1995; Goldfus and Arubas 2002).

Militaria

Temporary camps are known to yield few military fittings. No military find was uncovered at the siege camps on the northern and Southern cliffs of Nahal Hever, nor in the small camps at Narbata. During the most extensive archaeological survey of the siege camps yet conducted by Schulten in 1932, one iron trilobate arrowheads was uncovered (Schulten 1933, 166). Further military fittings were uncovered by Gutman in Camp A, by Yadin and by Forester, Arubas, Golfdus and Magness in the excavations in Camp F (see below).

III.20a – Camp A

History

In 1961, Gutman conducted a short archaeological excavation at camp A, which lies on the southern bank of Nahal Masada (Wadi e-Sabbah), east to the plateau of Masada. The work of the expedition concentrated in the camp's wall sector alone. The excavation was followed by a reconstruction of the wall and several architectural elements that abut it. As no final report was ever reproduce, the only data available derives from Gutman's popular book – *With Masada* (Gutman 1964).

Militaria

The finds in Gutman's excavation reaffirms the assertion that 'temporary camps are notorious for the fact that they seldom produce any finds' (Bishop and Coulston 1993, 37). Few arrowheads in addition to several *caligae* hobnails are the only fittings found to date. Unfortunately, even this scanty assemblage is not available, as the shed in which it was stored has been washed away, several decades ago, during a winter flash flood of Gutman's Kibbutz.

Catalogue

D. Hobnails

Gutman notes twice in his account that iron *caligae* nails were found (*ibid.*, 115). The two groups are restricted to the eastern wall, on both the eastern gate's sides. The gate and the two staircases in its immediate vicinity are seemingly the reason for the presence of the nails.

I. Archery

Three iron arrowheads are reported, all from the north-west corner of the camp (*ibid.*, 115). Though no description of the group is given, the heads most probably belong to the popular trilobate type, which other than a single exception constitutes the entire assemblage of arrowheads unearthed at Masada.

Although, it may be dangerous to draw conclusions on the basis of such a small assemblage, as well as the relatively limited excavated area, the location of the unearthed arrowheads is seemingly not without significant. As noted above, all the heads derive from the north-west corner of the camp. Being the closest sector to the fort, and consequently to the enemy, it is the location where archers have been surely posted in.

III.20b – Camp F

History

The modern exploration of the Camp F, involved few probing pits and the clearing of several units with in and adjacent to the camp by Yadin's expedition (1963-1965). The more extensive excavation of Camp F (1995), provided sound information, concerning the history of Camp F and Camp F_2. In addition, metal detector survey, brought the unearthing of metal objects, among which a cheekpiece that may have been buried as an offer. Further worthy of noting are metal finds that derived from outside of the camp walls, some of which are production waste that appear to indicate the existence of production in the field (**PL. III.20D: 3**; Vol. I, pp. 247, 257).

Catalogue

A. Helmet

1. Cheekpiece **PL. III.20: 2-3; III.20A: 1-2**

Site:.....Masada, Camp F
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (Survey)
Material:.....Copper-alloy and iron
Dimensions –
Length:....176mm
Width:.....142mm
Weight:...102.38gr

Complete cheekpiece. It is a variant of the Imperial-Gallic type A (Robinson 1975, 51, Pls. 98-103), or Weisenau type (Feugère 1994, 88-89). Uniquely, not only the front edge of the eye and mouth cut-outs is embossed by but the entire perimeter of the cheekpiece is recessed, a feature that to the best my knowledge is yet unattested elsewhere. The cheekpiece was attached to two iron hinge-plates that were riveted to the bowl.

The circumstances of its deposition still needs to be dwell upon, as it was uncovered in a metal detector survey. It appears to be buried under a floor of a tent unit in camp F, therefore dating to the time of the siege prior to the establishment of camp F_2. It is hard to accept that the object reflects an incidental loss. Temporary camps are notorious for the scant yielded *militaria* (Bishop and Coulston 1993, 37). These circumstances are presumably applicable to the Masada's camps too, for a Roman cleanup seemingly took place prior to the departure of the major siege force. The fact no other part of the helmet, but the cheekpiece was uncovered, appears to suggest that it was intentionally buried, possibly as an offer.

C. Limb defences

1. *Manica* plate **PL. III.20A: 3-4**

Site:.....Masada, Camp F_2
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91042
Material:.....Copper-alloy
Dimensions –
Length:.....92mm (88mm – distorted plate)
Width:.....14-16mm
Thickness:...0.5mm

The terminating plate of a Roman armguard (*manica*). See Vol. I, pp. 61-63. It was found during a metal detector survey.

E. Shields

1. Fragment of shield binding **PL. III.20A: 5**

Site:.....Masada, Camp F
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91022
Material:.....Copper-alloy
Dimensions –
Length:...33mm
Height:...15mm

Copper-alloy binding with lobate expansions. It is the sole example of this type, yet uncovered in Palestine, in contrast to its popularity in the Roman West.

Parallels – Valkenburg (NL) (Groenman-van Waateringe 1967, 72, Fig. 18); Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 25, Nos. 548-554, 556(?), 558, 561 (ample bibliography on p. 27)). Flat-headed circular: Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 25, Nos.

547, 555, 557); Hofeheim (DE) (Ritterling 1913, 143ff. No. 1 and Taf. 18, 24); Zwammerdam (NL) (Haablebos 1977, 219, Nos. 19, 221, Abb. 17, 19).

F. Edged weapons

1. Scabbard chape terminal **PL. III.20A: 6**
Site:.....Masada, Camp F_1
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91010/2
Material:.....Copper-alloy
Dimensions –
Length:.....11mm
Diameter:...13mm

Copper-alloy terminal of a scabbard chape. A nipple-like feature occupies it centre.

Parallels – Gamala (III.3/F.5-6), Masada (III.19/F.20) – with references. In the West: Verulamium (UK) (Webster 1958, 90, No. 199, Fig. 7 – with references); Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 126-127, 136-140 and 172-173, Taf. 8-9 – see p. 17 for references).

2. Scabbard chape terminal **PL. III.20B: 1**
Site:.....Masada, Camp F (unit XXX)
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91058/2-2
Material:.....Copper-alloy
Dimensions –
Length:.....21mm
Diameter:...21mm

Corroded scabbard chape terminal of somewhat robust structure. Three horizontal ridges decorates the outer face of the socket. Similar to next item.

Parallels – Scabbard tip of the *gladius hispaniensis* from the House of Caiphus (PL. I.7C: 2).

3. Scabbard chape terminal **PL. III.20B: 2**
Site:.....Masada, Camp F (unit XXX)
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91059/2-1
Material:.....Copper-alloy
Dimensions –
Length:.....21mm
Diameter:...23mm

Similar to previous item, though uncovered in a much corded state of preservation.

4. Scabbard mount **PL. III.20B: 3**
Site:.....Masada, Camp F
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91058/2-3
Material:.....Copper-alloy
Dimensions –

Length:...55mm
Width:....18mm

Reeded scabbard mount, with two fastening holes. The copper-alloy band is folded over. In Palestine, parallels are documented at Gamala (III.3/F.15-16) and Masada (III.19/F.23-25).

5. Scabbard U-guttering **PL. III.20B: 4**
Site:.....Masada, Camp F_2
Expedition.....Foerster, Arubas, Goldfus and Magness (1995)
Excavation No.:...L. 9999 (survey); B. 91043
Material:.....Copper-alloy
Dimensions –
Length of the longest fragment:...90mm
Width:.....6mm

Fragments of copper-alloy U-guttering of a scabbard. In Palestine, parallels are known at Gamala (III.3/F.12-14).

G. Belt

1. Copper-alloy frog **PL. III.19R: 5F**
Site:.....Masada, Camp F
Expedition:.....Yadin (1963-1965)
Excavation No.:...L. 4022; B. 25
Material:.....Copper alloy
Dimensions –
Length:.....33mm
Diameter of head:.....24mm
Diameter of shank's loop:...13mm

Complete, with raised perimeter and looped shank. A similar frog was found at the fortress of Masada (III.19/G.13) and Kh. Qumran (III.17/G.2).

K. Sling and stones

Slingshots

Heaps of pebbles were recently uncovered next to the entrances of *contuberni* in Camp F_2 at Masada (Silberman 1996, 104). These groups of stones, clearly slingshots, seemingly served as ammunition reservoirs and their location allowed immediate access in time of need.

M. Torsion artillery

Ballista balls

One large calibre stone ball was uncovered in the excavations, presumably a *ballista* ball. No further details were available at the time of writing.

Q. Riding equipment

1. Pendant **PL. III.20C: 1**

Expedition:.....Arubas, Goldfus and Magness 1995
Provenance:.....F_2 u.II/4
Excavation no.:...L.6039; B.61084
Material:.....Copper alloy
Dimensions –
Total length:.....50mm
Length of pendant:...40mm
Width of pendant:....24mm
Thickness:.....0.5mm
Bulbous terminal:.....4x2mm
Thickness of loop:....1mm
Weight:.....3.05gr

Copper-alloy pendant of a stylised leaf shape. The cast body an openwork of four cuts. It has a bulbous terminal and a coiled neck that terminates in a loop, part of which is now missing. It seems to be akin to a pendant from Tangiers (MR) (Boube-Piccot 1980, 370, Pl. 129, Nr. 631) and to Bishop's Type 4e: Rheingönheim (DE) (Ulbert 1969a, Taf. 36: 14). The coiling of the pendant's neck appears also on an 'apron' pendant from Darmstadt (DE) (Bishop 1992, Fig. 16: 3).

2. Pendant **PL. III.20C: 2; III.20D: 1**

Expedition:.....Arubas, Goldfus and Magness 1995
Provenance:.....F_1 U.24 (wall)
Excavation no.:...W.819; B.81055
Material:.....Copper alloy
Dimensions –
Total length:.....92mm
Diameter of pendant:.....59mm
Thickness of pendant:.....2mm
Width of loop:.....6mm
Diameter of hanger:.....20mm
Thickness of hanger:.....0.5mm
Length of hanger:.....33mm
Diameter of pin:.....2.5mm
Thickness of *pelta* terminal:...1.5mm
Weight:.....21.84gr

Parallels: Bishop 1988, Types 3a-3b – Dura Europos (Rostovtzeff *et al.* 1949, 19, Pl. VII: 92); Doorwearth (Brouwer 1982, Nr. 281); Hüfingen (*ORL* 62a, Taf. XI: 75) Newstead (Curle 1911, Pl. LXXXI: 3). See also: Ulbert 1969a, Taf. 36: 18.

3. Pendant **PL. III.20D: 3**

Expedition:.....Arubas, Goldfus and Magness 1995
Material:.....Copper alloy
Dimensions –
Length:.....18mm+
Width:.....9mm+

The tip of a harness pendant. Only the bulbous tip and small fragment of the body have survived.

III.21 – 'Aro'er

Map ref.: 1479 0624

Additional names: Bir 'Ara'ir; Khirbet 'Are'ere; Jordan (?)[61]

PL. III.21-III.21A

Reference: *TIRIP*, 68; *NEAEHL* I, 89-92

Geography

The site of 'Aro'er is located some 22km southeast of Beersheba. It was built upon a natural hill, which rises 50m above its surroundings (**PL. III.21: 2**). The site dominates the width road that lead from the Negev Mountain to Arad and Beer-Sheba.

History

Excavated between 1976 and 1982, the excavators, Biran and Cohen, identified among its layers a Herodian settlement. Seemingly unprotected by walls, the defence of the Herodian settlement (10 dunams) depended on the fortress unearthed within its boundaries (**PL. III.21: 1**; Biran and Cohen 1981; Biran 1983). Though the exact date of the establishment of this phase is still vague, scholars linked the fortress's construction with King Agrippa I (AD37-44), or earlier – as part of the alleged fortified southern border of Herod's kingdom. In a thorough and scholarly discussion Shatzman utterly rejects Gichon's notion of Herodian *limes*, on archaeological and historical grounds (Shatzman 1991, 238-246).

On the other hand, the date of the settlement's destruction is beyond doubt. A clear conflagration layer, dated to the late 60's of the 1st century AD (AD67), suggests the site came to ruins during the suppression of the First Revolt.

Militaria

In the large courtyard adjacent to the fortress, a copper-alloy boss was uncovered (**PL. III.21A: 1-3**). It derives from the destruction layer, which was assigned to the First Revolt on the basis of numismatic and ceramic evidences (Biran and Cohen 1981, 271-272). Recognised as a shield boss, the object was paralleled with the sculptural evidence of Trajan and Marcus Aurelius Columns and a wall painting from Dura-Europos alone (Hershkovitz 1992, 315, 317). The rectangular outlines of the artefact and the round hemispherical bowl in its centre clearly denote it as an *umbo* of a legionary *scutum*. This *umbo* is the sole example, to date, of its type in Palestine, which for its self is not a surprising fact, bearing in mind that the type is rather scarcely represented in the archaeological repertoire (Bishop and Coulston 1993, 82).

[61] For a recent suggestion to identify the site with Jordan, see – Zissu 2001, 227-228.

Catalogue

E. Shields

1. Shield boss **PL. III.21A: 1-3**

Site:.....'Aro'er
Excavation number:....L.843; B. 3112/1
Expedition:.....Biran (1978)
Context:.....Courtyard (destruction layer)
Material:.....Copper alloy
Dimensions –
Length:.....223mm
Width:.....167mm
Diameter of bowl:.....128mm
Height of bowl:.....44mm
Thickness at perimeter:...2mm
Diameter of holes:.....3-4mm

The bronze boss of a *scutum* was found in a destruction level of the First Revolt of the settlement at 'Aro'er. The pottery is typical of the period of the First Revolt. A coin of the governor Antonius Felix (AD59), which was found in the courtyard, provides a *terminus post quem*. It was published as a shield boss, though no archaeological parallels were given (Hershkovitz 1992, 315, 317). This type clearly adorned the legionary *scutum*, as attested by the legend inscribed on the boss form South Shields (UK) (Allason-Jones and Miket 1984, 213-214, No. 3.724, Pl. VII). Even though the representational evidence marks it as the popular boss type of the legionary *scutum*, it is not a common find – South Shields (*ibid.*; for updated discussion see: Bidwell 2001); Mainz (DE) (Neeb 1912, 49, Abb. 5); Carnuntum (AU) (von Groller 1901, 118, Taf. XX: 11-14); Aquincum (HU) (Hoffiller 1912, 64, No. 12).

The *umbo* from 'Aro'er has lost two small fragments of its perimeter and exhibits green patina. The edges of the boss were not carefully manufactured, and the outlines are slightly winding. It has a slightly convex section, along its axis, which corresponds well with the structure of the *scutum*. The upper and lower parts of the perimeter are bent forward, presumably as a result of its rip from the shield board.

It is relatively slender in proportions, leaving narrow perimeter at the centre (21mm), very similarly to a boss from Carnuntum (23mm) (von Groller 1901, Taf. XX: 12).

Six attachment holes are discernible, though the boss had originally one more hole at its perimeter's centre, now missing (7 holes: Carnuntum – von Groller 1901, Taf. XX: 13). The orientation of the boss's attachment to the board may be deduced from a comparison with the archaeological and sculptured evidence (Vol. I, pp. 85-86).

Group IV (interrevolts period)

IV.1 – Caesarea

Map ref.: 1407 2124

Other names: Pyrgos Stratonos (Straton's Tower); Qesaria, Qaisariye

References: *TIRIP*, 94-96; *NEAEHL* I, 270-291

History

In 63BC, Pompeius handed the city of Straton to the gentiles. It seems that Gabinius partly restored the city, but it was Herod that gloriously rebuilt it between 22-10/9BC, naming it *Καισάρεια* (Caesarea) after Augustus. The jewel of this project was the construction of a large new harbour (*AJ* 9.331ff, 17.136ff; *BJ* 1.408ff). Following the removal of Herod Archelaus from the throne and the establishment of Provincia Judaea in AD6, Caesarea became the city in which the procurators' headquarter was set (**PL. IV.1: 1**). The presence of military contingents is attested in dedicatory inscriptions as well as in the *NT* (Vol. I, p. 14ff). The tense relation between the pagan population and the Jewish minority climaxed in riots during the reign of Felix and re-broke under Florus, ultimately leading to the eruption of the First Revolt. Caesarea became a colony under Vespasian.

Militaria

The artefactual evidence from the city is rather meagre and limited, to date, to bone buckles. The vast excavations that were recently conducted at the site will seemingly add more artefacts to those published to date. Additional information may be gleaned from representational sources, like a muscle armour (**PL. IV.1: 2**), a sword that equips a Tiche (AD125) (**PL. IV.1A: 1**), and a gem that depicts a composite bow (**PL. IV.1A: 2**) that were uncovered at Caesarea.

Catalogue

G. Belt

Bone buckles

1. Buckle **PL. IV.1: 3**
Site:.....Casarea
Expedition:.....Porat
Excavation No.:...8\5\30082
Material:.....Bone
Dimensions –
Length:.....35mm
Width:.....35mm
Thickness:...8mm

A complete bone D-buckle (Ayalon 2002, 68, No. 97). Bone buckles seemingly formed integral part of the military belt assemblage (Béal 1983, 255, 381, Pl. 44: 1341; Grew and Griffiths 1991, Nos. 129, 131, 152, 156; Unz and Deschler-Erb 1997, Nos. 1192-1193, 1194-1209, Taf. 44 – bibliography on p. 37[62]). See next item (IV.1/G.2). Additional complete example consist part of the Wolfe Family collection (VI.9/G.1). It is possible that bone buckles and frogs (above – G.1.1) were used together as part of a set.

2. Buckle **PL. IV.1: 4**
Site:.....Casarea
Expedition:.....Porat
Excavation No.:...8\5\27784
Material:.....Bone
Dimensions –
Length:.....25mm
Diameter:.....10mm
Thickness:.....3mm
Diameter of hole:...2.5mm

Only the bone tongue of the buckle survived (Ayalon 2002, 69, No. 99). See previous.

[62] See further: Nos. 2012-2035, Taf. 70 – bibliography on p. 54.

IV.2 – Jebel Abu Saraj cliff, Cave VI/52 Map ref.: 19070 14320

Other names: 'Cave of the Niche'[63] **PL. IV.2**

Geography and History

The large cave (at least 11x30m; height: 1.4-4.8m) is situated at the northern cliff of the Quruntul ridge in the Shivta Formation (**PL. IV.2: 1-3**). Quarrying widened the natural cave and it was equipped by a water cistern. Access to the cave is difficult and can be easily blocked (Sion 2002, Part 1, 76-79, (Hebrew) Part 2, 62-63). Three large springs flows at the foot of the cliff. Although the cave has suffered from illicit excavations, two clear periods of occupation are distinguishable. Based upon culture material finds, like pottery and glass (*ibid.*, Part 1, 78, Part 2, 63), the first was more precisely determined to the period between the two revolts (AD73/74-132), while the study of fragmented textile pointed to inhabitation phase during the Early Islamic period.

Militaria

A rare fragment of an iron two-links snaffle bit was found in the cave (**PL. IV.2: 4**), merely published as an object made of a hinge that is attached to rings (*ibid.*, part 2, 63). The importance of the bit lies in its dating, to the barely represented period between the two Jewish revolt.

Catalogue

Q. Riding equipment

Bits

1. Fragmentary two-links snaffle bit **PL. IV.2: 4**
Site:.....Jebel Abu Saraj cliff, Cave VI/52
Provenance:.....Refuge Cave (?)
Expedition:.....Sion 1993
Excavation No.:...Unknown
Material:.....Iron
Dimensions –
Length of link: 50mm
Diameter of small (link) loop:...32mm
Diameter of large (link) loop:...55mm
Diameter of three loops:.....48mm

The object was described as 'made of a hinge... attached to two metal rings. Three other rings... are attached to the small ring' (Sion 2002, Fig. 35:2, Part 2, 63). It was found in the southern channel, in soil distributed during the illicit digging, presumably in Cistern I. The object is in fact a two-links snaffle-bit. The link has a collar and a mushroom-like terminal,

[63] Survey 1993 – Southern section, Unit 1, No. 13.

which is identical to the bit that is reported from Newstead (UK) (**PL. IV.2: 5**). Two lateral rings are attached to the link. One of the rings is holding two additional rings that seemingly held the reins and the bridle leather straps. Interestingly, the yet unstudied leather scraps that were uncovered in association with the bit (Sion 2002, Part 2, 62) could theoretically represent harness remains. An iron link of a two-links snaffle bit was found at Gamala (III.3/Q.2).

IV.3 – Kurnub (The Nabataean dump)

Map ref.: 1560 0485

Other names: Mampsis (*Mamashit*)

PL. IV.3

Reference: *TIRIP*, 94-96; *NAEAHL* III, 882-893

Geography

The city of Kurnub is situated some 40 km South-East of Beer-Sheva, on a junction between the ancient roads of Jerusalem-Hebron-Aila and Gaza-Beer-Sheva-Aila (**PL. IV.3: 1**). It seems that an additional road connected it with the city of Avdat. The water economy of the site was based upon a series of three water reservoirs that were formed by still standing dams.

History

The city was founded by the Nabataean in the 1st century BC, and is noted as one of the cities of Edomaea. During the Roman and late Roman days one of the major industries of the city was horse breeding. A Roman military cemetery of some 10 tombs was excavated by Negev, in which two inscriptions were found. One of which mentions a *centurion* that served in *legio III Cyrenaica* and *legio II Traiana*.

Militaria

The IAA conducted in 1994 a salvage excavation outside of the city's walls, in which a single javelin head was uncovered in an early Roman context.[64]

Catalogue

Shafted weapons

Javelin

1. Iron light javelin head **PL. IV.3: 2**

Site:.....Kurnub
Provenance:.....Dump (Nabataen)
Expedition:.....Gini (1994)
Excavation no.:...L. 9717; B. 991003
Material:.....Iron
Dimensions –
Total length:.....90mm
Length of blade:.....70mm
Width of blade (maximum):....17mm
Thickness of blade (mid rib):...8-9mm
Thickness of blade (wing):.....4mm

[64] I thank Tali Gini, Antiquities inspector of the South district of the IAA, for bring the object to my attention and providing me with details regarding the find's context unearthed in 1994 under her directory.

Length of tang:.....20mm
Diameter of tang:.....4-6mm

A light javelin head. Its blade was affected from the corrosion that resulted in its swelling. Originally it apparently belonged to the flat leaf shaped light javelin, used by the Nabataeans. Such heads was uncovered at Tel-Shalem (V.2/H.1-11) and 'Ein Rachel (IV.6/H.1-2) (Vol. I, pp. 132, 140, 221ff).

IV.4 – Calgouia (Mo'a?)

Map ref.: 1650 9940

Other names: Kh. Moyet 'Awad (?) **PL. IV.4**

Reference: *TIRIP*, 96; *NEAEHL* III, 1137-1140

Geography and History

A small square fortress (17x17m) was uncovered in Area B of the site (**PL. IV.4: 1**). It consists of eleven rooms that were built around an open courtyard (7x8m). The two relevant strata, of the three there detected, are dated to the 1st century AD and the 2nd and early 3rd century AD respectively. The peak of the site belongs to the former layer under the rule of the Nabataen King Hartat IV (9-40AD).

Militaria

A fragment of a *pteryges* from a sculptured bronze muscle cuirass was uncovered in the fortress, in addition to the blade of a backed dagger.

Catalogue

B. Armour

Muscle cuirass

1. Fragment of sculptured muscle-cuirass **PL. IV.4: 2**
Site:.....Mo'a
Provenance:.....Fortress
Registration No. (IAA no.):...81-2114
Material:.....Copper alloy
Dimensions –
Total length:.....297mm
Width of strap:.....49-54mm
Thickness of strap:.....4.5-5mm
Length of sawed strap:.....9mm
Width of sawed strap:.....54mm
Thickness of sawed strap:...6mm
Width of fringes:.....55-55.5mm
Width of a fringe:.....13mm (9-15mm)
Thickness of fringes:.....10mm

A copper-alloy elongated leather strap – *pteryges* – that hanged from the waists line down (see Vol. I, 51-52; Robinson 1975, 147-152; for sculpture evidence *cf.* Leander Touti A.-M. 1987, 42-3). The flap of the cuirass (lambrequin) is flat with raised edges. It is slightly curved in design, in order to create a more realistic representation. This optical manipulation is strengthen by the broadening of the flap's lower part. It has four terminating fringes which are determined by a double cable motif, exhibiting a fishbone-like design (Boube-Piccot 1969, Pls. 38, 54). Every individual fringe is designs from two interwoven groups of threads that are made from four or five threads each. All fringes are twisted five times, but the second fringe

from the right that exhibits six twists of threads. Two elongated holes are visible in the lower part of the fringes.

F. Edged weapons

Dagger

1. Backed dagger's blade **PL. IV.4: 3**
Site:.....Mo'a
Provenance:.....Fortress
Registration No. (IAA No.):...81-2115
Material:.....Iron and oxidized wood
Dimensions –
Total length (damaged):...345mm
Width of blade:.....33-30mm
Thickness of blade:.....11-8mm
Length of point:.....35mm
Width of point:.....25mm
Thickness of point:.....8-5mm

The blade of a straight backed dagger (Vol. I, p. 112ff). Both the blades faces exhibit oxidised remains, most probably of wood, amongst markedly an oxidised lump just above the blade's point. These traces cover much of the blade's length and seems to stop about 45mm from the distal end.

The section of the blade exhibits a strong oxidised core, of lenticular shape, while the edges surrounding it are relatively not rusted. This trait may provide us with insight in to the production procedure of the blade. The distinct differences in the oxidation level clearly suggest a difference in the composition and treatment under went on the blade parts. The core is evidently composed of low carbon iron, thus more prone to oxidation. Contradictory to the latter the edges hardly present any sign of oxidation. It is likely that the iron of the edges had been enriched with carbon hence it did not suffered from the contact with the oxygen.

Parallels: Nahal Yattir Site (V.33/F.1-2).

IV.5 – Mezad Har Massa

Map ref.: 1549 9975

Reference: *TIRIP*, 185

Geography and history

During the emergency survey in the Eastern Negev at 1982 a small Nabataean fort was located, on the Petra-Gaza road, at the foot of Mount Massa.[65] Between December 1982 and June 1983 rescue excavations were conducted in the site under the directory of Rudolf Cohen on behalf of the IAA (Cohen 1984).

The structure measures 10x20m and includes two rows of parallel rooms. From the pottery unearthed on the floors, the excavators dated the site to the 1st century AD. Adjacent to the building a tomb was found.

Militaria

The only military associated find has been uncovered in the above-mentioned tomb. The latter included a skeleton, near the neck of which a wooden point was discovered (Yigal Israel, *pers. comm.*), possibly the cause of death.

Catalogue

I. Archery equipment ?

1. Wooden point (footing?) (not illustrated)
Site:.....Mezad Har Masa
Expedition:.....Cohen (1982-1983)
Provenance:.....Tomb
Excavation number:...Unknown
Material:.....Wood

The whereabouts of the point are unknown and no photo was available. I relied upon the testimony of Yigal Israel (IAA). If indeed of small dimensions, the point might have been a wooden tipped arrow, examples for which were reported from Dura-Europos (SY) (James 1990, 85-86, Nos. 1-10).

[65] Mount = *har* in Hebrew.

IV.6 – 'Ein Rachel

Map ref.: 1663 0046

Reference: *TIRIP*, 122; *NEAEHL* III, 1143 **PL. IV.6-6A**

Geography and history

The small fortress occupies a high hill north of the spring of 'Ein Rachel, along the Arabah route some 10km north of Calgouia (Mo'a?). The site was surveyed in 1980 and was excavated in the following year by Nahlieli and Israel (IAA). The fortress consists of a square structure (16x16m), in which eight rooms encircle a central courtyard. Two layers were observed at the fortress: BC160-9AD and 9-106AD (**PL. IV.6: 1**).

Militaria

In addition to arrowheads and light javelin heads, an iron girth buckle was uncovered at the site. A pair of small copper-alloy embossed plates that shares some similarities with the Newstead-type vertical fasteners ('eye fitment'), appear to be earrings rather than armour's fittings (Vol. I, p. 39).

Catalogue

H. Shafted weapons

1. Iron light throwing javelin **PL. IV.6: 2-3**
Site:.....'Ein Rachel
Excavation no.:.....Locus 16 (on box) / Locus 15 (on card); Basket 185
Material:.....Iron
Total length:.....69mm+
Length of blade:.....65mm
Width of blade:.....13mm
Thickness of blade:...3mm
Length of tang:.....4mm+
Width of tang:.....2.5mm
Thickness of tang:.....2mm
Weight:.....5.56gr

Iron mid-ribbed light javelin head. The leaf elongated head is missing most of its tang. See next item.

2. Iron light throwing spearhead **PL. IV.6: 4**
Site:.....'Ein Rachel
Excavation No.:...Locus 16; basket 199
Material:.....Iron
Dimensions –
Length:.....72mm+
Length of blade:.....62mm
Width of blade:.....15mm
Thickness of blade:...3mm
Length of tang:.....10mm+
Width of tang:.....4mm

Thickness of tang:.....2mm
Weight:.....4.53gr

Iron mid-ribbed light javelin head. The blade is heavily chipped. Most of the tang is broken. See previous item. A large group of parallels is reported from Tel-Shalem (V.2/H.1-14).

I. Archery

Iron arrowheads

1. Iron flat arrowhead **PL. IV.6A: 1-2**
Site:.....'Ein Rachel
Provenance:.....Early fortress
Expedition:.....Nahlieli and Israel (1981)
Excavation No.:...L. 13; B. 176
Dimensions –
Total length:.....71mm
Length of head:.....35mm
Length of tang:.....36-41mm
Width of head:.....13mm
Thickness of head:...1-2mm
Thickness of tang:...4x6mm
Weight:.....3.99gr

The corroded iron head has a flat leaf shaped head. The stout tang is rhomboid in cross-section. It originated in the early fortress the head dates between the 160BC and 9AD. Leaf shaped tanged arrowheads were reported in First and Second Revolts contexts: Gamala (III.3/I), Wadi Murabba'ât (V.16/I.6) and The Spear Caves (V.17/I.2). See also Samaria (**PL. I.6A: 8**).

Q. Riding equipment

1. Girth buckle **PL. IV.6A: 3**
Site:.....'Ein Rachel
Expedition:.....Nahlieli and Israel (1981)
Provenance:.....L.16; B.243
Material:.....Iron
Dimensions –
Total Width:.....43mm
Total length:.....42mm
Thickness:.....3-4mm
Weight:.....10.63gr

The large D-shaped iron buckle is square in section. A recess for the tongue's tip is located at the loops top. The large size of the buckle may imply it was used as a girth buckle. Although the loop of these buckles appears to be shorter (Bishop 1988, 129, Fig. 36, Table 2). A parallel is reported from Kh. Qumran (III.16/Q.1).

2. Iron ring – junction? (not illustrated)
Expedition:.....Nahlieli and Israel (1981)

Provenance:.....L. 12
Material:.....Iron
Provenance:.....Upper fortress
Diameter:.....45-47mm
Thickness of ring:...4-5x5-6mm
Weight:.....16.78gr

Varia

The following objects bear some resemblance to the Newstead-type vertical fasteners (Vol. I, p. 39; Thomas 2003, 89: 1-4, type Giv). However, the outlines of the plates with the dotted perimeter, and the upper recess, indicate they cannot be interpreted as segmental armour's fittings but rather as earrings.

1. Copper-alloy earring? **PL. IV.6A: 5-6 (left)**
Two fragments of a copper-alloy earring.

Locus: 20A; basket: 22/1
Dimensions – length (damaged): 35mm; width (damaged): 19mm; thickness: 1mm; diameter of hole: 1mm; weight: 1.48gr.

Locus: 20A; basket: 22/2
Dimensions – length (damaged): 41mm; width (damaged): 17mm; thickness: 1mm; diameter of hole: 1mm; weight: 1.70gr.

2. Copper-alloy earring? **PL. IV.6A: 4, 5-6 (right)**
Locus: 20 (on box)
Dimensions – length: 49mm; width: 24mm; thickness: 1mm; diameter of hole: 3.5mm; weight: 5.02gr.

Group V (Second Revolt)

V.1 – Tannūriyye

Map ref.: 2244 2625

Other names: Kh. Mezad Tannūriyye

PL. V.1

Reference: *TIRIP*, 239; *NEAEHL* I, 526, 534

Geography and history

The small fort of Kh. Tannūriyye (25x25m) is situated west of the modern 'Oil road' surmounting a small hill. A section made in the north-west corner of the Roman fort was studied by Clare Epstien and Ahmed Farakhat. It was reported that pottery shards from the 2nd century AD were uncovered, as well as bone remains with no further specifications (Epstein 1975).[66]

Militaria

An iron *spatha* was uncovered at the fort; now on display in the Museum of Qatzrin. The surveyors conjectured that the sword might have originated in a tomb.

Catalogue

F. Edged arms

Swords

1. *Spatha* **PL. V.1: 1-2**

Site:.....Tannuriyye
Provenance:.....Fort
Excavations:.....Epstein (1975)
Material:.....Iron
Dimensions –
Length:.....800mm
Length of blade:...730mm
Width of blade:.....6mm

The elongated sword was uncovered in 2nd century AD context. The thin and long sword is slightly bent upwards. Epstein suggested that the sword originated in a tomb (For swords in funereal context, see Vol. I, pp. 176-177; also Stiebel 2004a).

[66] I thank the late Dr. Clare Epstein for the permission to study the sword.

V.2 – Tel-Shalem

Map ref.: 1999 2001

Other names: Salem, Salumias, Tell er Radgha

PL. V.2-V.2A

References: *TIRIP*, 219-220 (Salem III)

Geography and history

The site of Tel-Shalem is situated in the Northern Jordan valley, some 11km south of Beth-Shean (Scythopolis) and 2km west of the River Jordan. Eleven springs are located in the immediate environs of the site, most notably 'Ein Abraham. Several milestones were uncovered 5km to the west, at Nahal Bezeq. A site of the military camp (250-300m) was surveyed. Tel-Shalem was used as a base camp of the Roman army, seemingly erected in the early 2nd century AD by *legio VI Ferrata*. An inscription of a *vexillum* of this legion was found at the site and now is on display at the Hecht Museum. Foerster conducted a short season at the site in 1976 in the boundaries of the Roman camp and in late 1976 and early 1977 (Foerster 1976; Foerster 1977, 78; Foerster 1978). The attention was drawn to the site, following the incidental discovery of a copper-alloy statue of armour-clad Hadrian (Foerster 1986) and the reveal of a monumental Latin dedicatory inscription (Eck 1999b).

Militaria

The excavations of tombs from the Mamluk period (AD1260-1516) revealed they were dug into the Roman layer (Foerster, *pers. comm.*). The unearthed assemblage contained Roman *militaria*, which is comprised of a group of javelin-heads, a sword tang, a copper-alloy harness pendant and few iron hobnails.

Catalogue

B. Armour

Muscle cuirass

1. Armour-clad statue **PL. V.2: 1-3**

For the copper-alloy statue of Hadrian (Foerster 1986; Gergel 1991), see: Vol. I, pp. 51-52.

D. Military dress and footwear

Caliga hobnails

1. Group of *caliga* hobnails **PL. V.2: 4**

Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –

Diameter of head:.....12-15mm
Height of head:.....6-7mm
Length of shank:.....14mm
Thickness of shank:....2-3mm

Four hobnails, with a typical dome-shaped head, have been unearthed in the Mamluk tombs. Like the rest of the finds, hereby described, they appear to be related to the Roman layer. All nails have suffered from corrosion consequently of which two are lacking theirs shanks. One stud still retains most of its shank that curves, in 90°, after 9mm. This measure present the thickness of the sole's leather layers, in which it was transfixed.

F. Edged weapons

1. Sword tang **PL. V.2: 5**
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Excavation number:...Unknown
Provenance:.....Tomb
Material:.....Iron
Dimensions –
Length (damaged):....61mm
Thickness:.....13mm

A poorly preserved fragment of tang. Only the upper most part of it has survived, exhibiting a square section. Signs of hammering are visible on the tip of the tang. A similar ferrous fragment, reported from Dura-Europos, was classified under the edged arms category, as a sword tang (James 1990, 188: 2.3.5).

H. Shafted weapons **PL. V.2A: 1 (Nos. 1-11)**

A group of 11 elongated heads, with a prominent medial-rib was uncovered at Tel Shalem. In light of the consistently changing length of the heads it is tempting to consider them as a set. Parallels from 'Ein Rachel (IV.6) and Kurnub (IV.3) suggest this type was used by Nabataean/Arab forces (Vol. I, pp. 132, 140, 221ff); *cf.* also: Murabba'ât Caves (V.16).

1. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....50mm
Width of blade (max.):.....14mm

2. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron

Dimensions –
Overall length (damaged):.....118mm
Width of blade (max.):.....16mm
Thickness of blade (medial-rib):...~4mm

3. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....110mm
Width of blade (max.):.....13mm
Thickness of blade (medial-rib):...~6mm

4. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....96mm
Width of blade (max.):.....18mm
Thickness of blade (medial-rib):...7mm

5. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....48mm
Length of blade:.....40mm
Length of tang:.....8mm
Width of blade (max.):.....16mm
Thickness of blade (medial-rib):...~5mm
Thickness of tang:.....3mm

6. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....84mm
Width of blade (max.):.....14mm
Thickness of blade (medial-rib):...7mm

7. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –

Overall length (damaged):.....80mm
Length of blade:.....76mm
Length of tang (damaged):.....4mm
Width of blade (max.):.....12mm
Thickness of blade (medial-rib):...7mm
Thickness of tang:.....3-4mm

8. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....79mm
Length of blade:.....75mm
Length of tang (damaged):.....4mm
Width of blade (max.):.....13mm
Thickness of blade (medial-rib):...5mm
Thickness of tang:.....3mm

9. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....67mm
Width of blade (max.):.....14mm
Thickness of blade (medial-rib):...6mm

10. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....65mm
Length of blade:.....63mm
Length of tang (damaged):.....2mm
Width of blade (max.):.....12mm
Thickness of blade (medial-rib):...6mm
Thickness of tang:.....2mm

11. Iron javelin head
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Iron
Dimensions –
Overall length (damaged):.....62.5mm
Length of blade:.....57.5mm
Length of tang (damaged):.....5mm
Width of blade (max.):.....14mm
Thickness of blade (medial-rib):...6mm

Thickness of tang:.....3mm

Q. Riding equipment

1. Pendant
Site:.....Tel-Shalem
Expedition:.....Foerster 1976
Provenance:.....Tomb (Mamluk)
Material:.....Copper alloy
Dimensions –
Height of loop:.....17mm
Width of loop:.....3mm
Thickness of loop:.....2mm
Inner diameter of loop:.....4.5mm
Measurements of object (damaged):...31x20mm

A small, heavily corroded, fragment of a presumably harness's pendant. The only complete element is its attachment loop.

V.3 – Legio

Map ref.: 1671 2203

Other names: Capercotani; Kefar 'Othnai; Maximianopolis; Lejjun **PL. V.3-V.3D**

Reference: *NEAEHL* III, 1003; *TIRIP*, 170, 182

Geography and history

The area of Legio is situated in a strategic crossroads, near the outlet of Wadi 'Ara to Jezreel Valley (Tepper 2003). It consists of several settlements: the Jewish village of Kefar 'Othnai (Capercotani), the city of Maximianopolis and the site of the camp of *legio VI Ferrata*. The exact location of the latter is still to be determined (**PL. V.3: 1**). Tepper has recently pointed out the eastern hill of El Manach as the location of the camp (*ibid.*, 235). However, this suggestion still needs to be dwell upon, as part of the interpreted data is incorrect; an example for which is the alleged gatehouse that was decorated with a pair of lions, which is in all likelihood a tomb.

Militaria

Recent surveys by Tepper and the browsing of private collections revealed a wealth of militaria ranged in date from the 1st to the 4th centuries AD. The following catalogue refers only to the early group of finds.

Catalogue

* The text was extracted from the forthcoming report of the small finds from Legio (Stiebel and Tepper forthcoming), hence the different style of presentation.

A. Helmets

1. Helmet carrying handle (?) **PL. V.3: 2**

Reg. No.: G.O.–110 (Survey No.: 180)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

A fragment of rhomboid-sectioned handle with ridged and grooved terminals. The tip of the handle has pomegranate shape. Several such handles were found at Masada, and in the west: Corbridge and Rhine at Mainz (Robinson 1975, Figs. 79-80); South Shields (Allason-Jones and Miket 1984, nos. 3:424-425). Early examples are reported from the Republican site of Cáceres el Viejo (ES) (Ulbert 1985, nos. 103-108).

Dimensions – Fragment: 31x19mm; Thickness of handle: 3-6mm; Length of terminal: 16mm; Weight: 5.53gr

B. Armour

Scale armour

Fragments of *lorica squamata* (scale armour) from the Roman period were gathered from the surface of the nearby Tell Megiddo. Several groups of scales are included in the publication of the excavation of the Chicago's expedition to the biblical site (V.4/B/1-4), which are clearly Roman in date. A complete section of a scale armour was uncovered during cultivation activities in fields in Legio's environs, currently exhibited in 'Ein Shemer Museum.

1. Section of scale armour **PL. V.3A: 1**

The complete segment comprises 13 lines of scales – 2 lines of Type 9 and 11 lines of Type 8. It appears to be a collar or a shoulder-piece. Indeed, it is very similar in shape to the collar segment of a Sarmatian scale armour (Negin 1998, Pl. 6); see also Carlisle (UK): (**PL. V.3A: 2**). The fact that two types of scales were clearly used in the same cuirass is of great importance. This phenomenon was apparently employed in the construction of the scale armour from Tel 'Azeqa (V.11/B.1). It seems that the small type of scales was used for the external rows, as a sort of a hem.

Dimensions – scale type 8: 22-23x9-10; scale type 9: 15x8mm.

Laminated armour

2. Buckle hinge plate **PL. V.3: 3**

Reg. No.: G.O.–100 (Survey No.: 197)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

A copper-alloy D-shaped buckle, the loop of which did not survive. The D-shaped buckle is a common find in Roman military site, from the *principate*: Vindonissa (CH) (Unz and Deschler-Erb 1997, 30-31, Nos. 732-763, 765-790 – with bibliography). It was used for fastening the breastplates and top backplates of the laminated armour (Type A-C) as well as the breastplates to the upper plates of the assembly of the cuirass (Type A alone). For the terminology *cf.* Allason-Jones and Bishop 1988, Figs. 22-24.

Dimensions – Plate: 15x15mm; Thickness of plate: 0.5mm; Length of hinge pin: 18mm; Diameter of hinge pin: 2mm; Length of tongue (distorted): 14mm; Width of tongue: 2.5mm; Diameter of fastening pin: 3x4mm; Weight: 1.91gr

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail (not illustrated)

Reg. No.: G.O.–108 (Survey No.: 198)

Site: Legio; Collection: Giva'at Oz; Material: Iron

Iron hobnail, with a typical dome head and stem. The tip of the latter is bent. The length of the straight part of the stem – 10mm – indicates the thickness of the sole's layers but the upper most, which was not pierced of coarse by the stem.

Dimensions – Total length: 17mm; Diameter of head: 10mm; Height of head: 5mm; Diameter of spike: 3-5mm; Weight: 1.41gr.

E-F. Shields and swords

PL. V.3B: 1-2

Shields and edged weapons are represented at Legio only in the representational evidence. A large stone object, presumably a capitol, was found on the southern slope of Kibbutz Megiddo. It was discovered just at the foot of pillared road of Maximianopolis, a (initially noted in Tepper 2002, 235, Fig. 12, it will be published by Tepper and Stiebel, forthcoming).

The stone object is 0.8m in diameter and 0.6m high. It has a trapezoid cross-section and was clearly reused in a latter period as a vat in an industrial machine as attested by the depression and the groves discernable on its faces. These deformations caused Tepper to the erroneous assertion that the equipment is 'hung on city's battlement'. The stone that seemingly served as a capitol of a triumphal column was decorated by a dozen of hexagonal shields and four swords.[67] Tow parts of a large attic base (diameter: 120cm) were found near the discovery point of the capitol (Tepper, *pers. comm.*). The shields are arranged in four groups of three, the central shields of which are represented straight while the two laterals shields are crafted bent. Behind the lateral shields of each group a sword is presented. Only the handle assemblage and part of the blade is depicted.

The number of the shields may be linked with the celebrated dozen *ancilia* (D&S, s.v. *saliens*). This linkage and the association with Mars will be dealt in a separate paper.

G. Belt fittings

Frogs

1. Frog **PL. V.3C: 1**

IAA. No.: 96-6021 (Survey No.: 199)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy and niello

[67] The shields are the major military element. A relief from Bologna (IT) (Picard 1957, Pl. XXVIII) and the sculpted fragments of Septimus Severus Arc from Lepcis Magna (*Ibid*, Pl. XXXI).

Copper-alloy frog with circular head and looped shank. The frog's head is slightly distorted and the loop of the shank is cut. It fits Wild's type VIIIb (Wild 1970, 154). A compass-drawn rosette design ornaments the head. Three-petalled rosette constitutes the main motive, each of the spaces between of which is filled with a small four-petalled rosette. The perimeter is decorated with three running pairs of petal-like segments that link the large petal-tips.[68] The depressed ornamentation was punched, as attested by the outlines of the petals. It was originally filled with niello, most of which is now lost, due to an aggressive chemical and mechanical treatment that the object unfortunately under went, following its discovery.

No direct parallels are known to the frog under discussion. The fact this design is so much at home in the East, may hint for an eastern origin, though such a notion should be determined only by future metallurgical tests.

Dimensions – Diameter of head: 28mm; Thickness of head: 1mm; Height: 9mm; Length of shank: 33mm; Width of shank: 4-7mm; Thickness of shank: 1-5mm; Diameter of loop (external): 16mm; Thickness of loop: 2-3mm; Weight: 8.75gr

2. Frog **PL. V.3C: 3**

Reg. No.: G.O.–102 (Survey No.: 201)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

Dome-head copper-alloy frog. From the plain head protrudes an angled shank, the tip of which is lost. The latter fact prevents us from determining the object's exact type, as part of the frogs had looped shank while others exhibit triangular end. The frog under went aggressive chemical and mechanical treatment.

Dimensions – Diameter of head: 20mm; Thickness of head: 4mm; Height: 12mm; Length of shank (damaged): 25mm+; Width of shank: 4-7+mm; Thickness of shank: 1-4mm; Weight: 8.08g

3. Gilded frog **PL. V.3C: 2**

Reg. No.: G.O.–103 (Survey No.: 200)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy and gold

Circular frog with a flat head that bears the scant remains of gilding. Only a short stump of the shank has survived. The apply of precious metal on military equipment is well documented in the lines of the Roman army, yet in that respect gold is not a very common find. In the west dagger sheaths were inlayed with gold (Bishop and Coulston 1993, 192; Appendix 1.3 (*e*)).

[68] The rosette is a common motif in Palestine. In the local assemblage of designs one may find the petalled-rosette on Jewish ossuaries (Rahmani 1994), bone artefacts, *etc.*

Dimensions – Diameter of head: 25mm; Thickness of head: 1mm; Thickness of shank: 5mm; Length of shank: 8mm+; Weight: 4.07gr

'Apron' fittings

4. 'Apron' stud (not illustrated)

Reg. No.: G.O.–101 (Survey No.: 210)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy + silver

Circular flat-headed stud. The upper face of the head is silver-plated and a shank raise from the underside's centre, most of which is missing. The diameter of the head falls within the suggested range for 'apron' studs: 14-18mm, though it lacks the two raised concentric rings underneath the head that was asserted as a possible typological trait (Bishop 1992, 96). Such studs, though undecorated were found in Vindonissa (Unz and Deschler-Erb 1997, Nos. 2207-2208, 2210-2214).

Dimensions – Diameter of head: 14mm; Thickness of head: 1mm; Height: 4mm; Diameter of shank: 2-3mm; Length of shank (damaged): 3mm+; Weight: 0.7gr

K. Sling

Stone slingshots

PL. V.3C: 4

Three stone balls were uncovered by Tepper, in his survey of Legio, two of limestone and one of flint. The balls were seemingly used as slingshots. They were certainly not *ballista* balls as their weight falls below the minimal weight provided by Vitruvius of 'duo pondo' (Vitr. 10.11.3); for *funda librilia*, see: Vol. I, p. 187ff.

1. Stone slingshot

Site: Legio; Expedition: Tepper 1999; Survey no.: 16-21-88-04; Material: Limestone

Dimensions – Maximum diameter: 59mm; Minimum diameter: 49mm; Weight: 312.45gr

2. Stone slingshot

Site: Legio; Expedition: Tepper 1999

Dimensions – Maximum diameter: 59mm; Minimum diameter: 50mm; Weight: 313.96gr

M. Artillery

Ballista balls

Two limestone *ballista* balls were found in the region of Legio, both belong to the large calibre category. One from the Megiddo collection: 300-330mm in diameter and weighs 21kg (**PL. V.3D: 1**), while the other, from the southern sector of Legio is 200-220 in diameter and weighs 20kg (Tepper, *pers. comm.*).

Q. Riding equipment

Bells (not illustrated)

Three copper-alloy bells were found in the collection of Kibbutz Giva'at Oz (Survey Nos.: 211-213). The bells are spherical in shape with transverse slits. One of the bells is decorated by floral design and has an identical parallel in Carnuntum (AU) (Junkelmann 1996, Abb. 181, middle).

Harness pedants

1. Teardrop pendant **PL. V.3D: 3**

Reg. No.: G.O.–106 (Survey No.: 215)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

The petit dimensions of the copper-alloy pendant seemingly hint it was used as the inner decoration of a *lunula* (lunate pendant), which is a common combination throughout the Roman empire (Bishop 1988, 98 Types 8-9, Figs. 47-48; Unz and Deschler-Erb 1997, Taf. 48, Nos. 1314, 1325). In the east a smaller version of the type is found at Gamala (Gutman 1994, 98). Lunate pendants are documented in military contexts, with association with cavalry harness, from Augustan period through to Second century AD (Bishop 1988, 98).

Dimensions – Total length: 34.5mm; Length of body: 23mm; Width: 14mm; Thickness: 0.5mm; Thickness of bulbous: 3mm; Weight: 1.18gr

2. Teardrop pendant **PL. V.3D: 2**

Reg. No.: G.O.–107 (Survey No.: 214)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

The suspending neck of the copper-alloy pendant is partly missing. It is twisted is a like manner to a larger pendant from Vindonissa (Unz and Deschler-Erb 1997, No. 1515). For parallels see the previous item.

Dimensions – Total length: 27mm; Length of body: 22mm; Width: 14mm+; Thickness: 0.5mm; Thickness of bulbous: 3mm; Weight: 0.6gr

3. Teardrop pendant (not illustrated)

Reg. No.: G.O.–112 (Survey No.: 216)

Site: Legio; Collection: Giva'at Oz; Material: Copper alloy

Fragmented copper-alloy teardrop pendant. Only its lower half came down to us. For parallels, see the previous item.

Dimensions – Length: 28mm+; Width: 16mm; Thickness: 0.5mm; Thickness of bulbous: 3x4mm; Weight: 1.12gr

4. Vine leaf pendant **PL. V.3D: 4**

Reg. No.: G.O.–111 (Survey No.: 217)

Site: Legio; Material: Copper alloy

Complete copper-alloy pendant of elongated rhomboid outlines with bulbous tip and stylised leaf features near its fastening loop. In first glance the object appears to relate to Bishop's type 11a (Bishop 1988, 156, Table 6, Fig. 49); Rheingönheim (Ulbert 1969a, Taf. 36, 15) and Vindonissa (Unz and Deschler-Erb 1997, Nos. 1408-1434, with bibliography). Yet, the decorative distal element suggests a viniculture influence.

The harness decorations of the Roman cavalrymen have strong affinity to the theme of viniculture (Bishop 1988, 96). A great variety of stylised vine leaf-like pendants are reported throughout the empire (Bishop's type 4), a close parallel to the pendant from Legio is documented in Vindonissa (Unz and Deschler-Erb 1997, No. 1548).

Dimensions – Weight: 2.96gr

V.4 – Megiddo

Map ref.: 1675 2212

Other names: Tell el-Mutesellim, Armageddon **PL. V.4**

Reference: *NEAEHL* III, 1003-1024

Geography and history

The famous mound of Megiddo is situated in the outlet of Wadi 'Ara to the Jezreel Valley. It overlooked two major roads of ancient Palestine, most notably the international *Via Maris* which connected the Sharon with Jezreel Valley through Wadi 'Ara (**PL. V.4: 1-2**). Its strategic location was the arena of many battles throughout history. The militaristic importance of Megiddo is reflected in the Christian Apocalypse that describes Mount Megiddo (*Ἁρμαγεδων* = Har Megiddo)[69] as the battlefield of all kingdoms in the end of days (Jn. 17.12ff.).

The extensive archaeological research of the site indicated that it was abandon at the end of the Persian period (350BC) (Strata I = 600-359BC). During the Roman period the occupation has shifted south to the plain at the foot of the site. There, the Roman army have erected the base camp of the *legio VI Ferrata* (Schumacher 1908, Abb. 261, 286-7; V.3 – above) which served later as the core for the city of Maximianopolis. The uncovering of the fittings on the slopes of the mound indicates that the military activity extended to the boundaries of the mound.

Militaria

Several specimens of armour scales were discovered on the surface of the slopes of the mound during the excavations of the Chicago University expedition (1925-1939), none of which were identified as Roman in date.

Catalogue

B. Armour

A total number of sixteen bronze scales are noticeable in the Final Report – Megiddo I (Lamon and Shipton 1939, Pl. 85, Nos. 9-10 and Pl. 176, No. 9), none of which were assigned with a date. Most of the scales still retain the copper-alloy fastening wire clips. Two types of scales are represented both are evidently strange to the biblical tradition and evidently date to the Roman period. Though in a later publication Yadin have regarded them as biblical in date (Yadin 1968, 965, Table D: 16-17)[70], the characteristics of the scales clearly indicate a Roman origin, most likely of the 2nd century AD. The most represented type is the thin elongated

[69] A Greek version of the Hebrew: הר מגדו (*Har Megiddo*) = Mount Megiddo.

[70] The drawing of the scales in Yadin's publication were erroneously produced 'right to left'.

scale, with no mid rib, and four pairs of fastening holes spaced along its edges' centre (Type 8). Additionally, we may note three examples of the rarer Type 10 – a tubby scale with a series of 3 pairs of holes occupying its upper edge. Found together it may be carefully suggested that both scales' types originate from the same suite, though this is merely a conjectural suggestion (*cf.* V.3/B.1 and V.11/B.1). The discovery of small number of scales suggests a wear and tear process, which caused the scales' dropping off (Croom 2000, 130-132; Vol. I, p. 46).

Copper-alloy scales

1. Group of seven scales **PL. V.4: 3**
Site:.....Megiddo
Expedition:.....Chicago 1925-1939
Provenance:.....Surface – East slope
Excavation number:...1856 (near Tomb 59)
Material:.....Copper alloy
Dimensions –
Length:.....24mm
Width:.....11mm
Thickness:...0.5mm

Seven copper-alloy scales were found on the eastern slope of the mound, five of which are still fastened together (Lamon and Shipton 1939, Pl. 176, No. 9). They belong to Type 8, identical examples of which were found at Megiddo (below Nos. 2-3). Four pairs of holes were spaced along the scales perimeter centres allowing their fastening. The side holes were used to fasten the scales laterally, while the upper and lower pairs were used to attach the row of scales from above and below respectively. The fastening of the rows of scales was such that the proximal end of the scales covered the head of the row (distal end) below it. This type lacks the mid-rib feature and the upper and lower clippings functioned as stoppers being spaced along in the scales' axis.

2. Bronze scale **PL. V.4: 4**
Site:.....Megiddo
Expedition:.....Chicago 1925-1939
Provenance:.....Surface
Excavation number:...M404 (Square S-15)
Material:.....Copper alloy
Dimensions –
Length:.....24mm
Width:.....10mm
Diameter of holes:.....2mm
Thickness of wire clips:...1mm

Identical to pervious (Lamon and Shipton 1939, Pl. 85, No. 9).

3. Group of five bronze scales **PL. V.4: 5**
Site:.....Megiddo

Expedition:.....Chicago 1925-1939
Provenance:.....Surface
Excavation number:....M491 (Square T-16)
Material:.....Copper alloy
Dimensions –
Length:.....24mm
Width:.....10mm
Diameter of holes:.....1.5-2mm
Thickness of wire clips:...1mm

Identical to No. 1 (Lamon and Shipton 1939, Pl. 85, No. 10 (part)).

4. Group of three bronze scales **PL. V.4: 6**
Site:.....Megiddo
Expedition:.....Chicago 1925-1939
Provenance:.....Surface
Excavation number:...M404 (Square S-15)
Material:.....Copper alloy
Dimensions (of complete scale) –
Length:.....24mm
Width:.....16mm
Diameter of holes:.....3mm
Thickness of wire clips:...1mm

The three tabby scales have triple vertical pairs of fastening holes below the upper edge – Type 10 (Lamon and Shipton 1939, Pl. 85, No. 10 (part)). The side holes served to fasten the scales laterally, while the central pair being used for a stitch to hold linked rows to the foundation. The bottom of this type is rounded. No exact parallel is known to me from the Roman Empire, though rather close examples, albeit smaller in size and somewhat of shape are reported from Corbridge (UK) (Anstee 1953; Robinson 1975, 154, Fig. 162, Pl. 439; Clemetson 1993, 8-9); Caerleon (UK) (Clemetson 1993, 9, note 7), Great Chesters (UK) (Allason-Jones 1996, 193, No. 37, Fig. 10), Vindobona (AU) (Neumann 1967, 54, Taf. XXXVI, 1) and Carnuntum (AU) (von Groller 1903, 103, Fig. 47). In the East, the latter type is represented at Dura-Europos (SY) (Clemetson 1993, 9) and Jerusalem (III.12/B.3) – although the latter feature 3 holes and midrib (Type 5). This small scale is also typified by a pointed bottom and slightly domed lower half, features that are evidently lacking at the Megiddo examples.

V.5 – 'Ein Feshkha

Map ref.: 1249 1929

Other names: 'Enot Zuqim

PL. V.5-V.5A

Geography and history

The oasis of 'Ein Feshkha is situated some 2.5km south of Qumran. The main spring – 'Ein Feshkha (lit. 'the broken spring') – is the most flowing of the area's springs. A pass was climbing the cliff to the west (Ras Feshkha). The site that was excavated by de Vaux in 1956 and 1958 was re-examined in 2001 by Hirschfeld. It comprises of a large building (suggested by the latter to be a *Villa Rustica*) and an industrial installation from the Early Roman period, which came to ruins in the Second Revolt (**PL. V.5: 1-2. V.5A: 1**). A 'legionary brick' was apparently found at the site (Donceel and Donceel-Voûte 1994, 14, note 44).

Militaria

A single iron arrowhead is reported from the main building.

Catalogue

I. Archery

Iron arrowheads

1. Iron bodkin tanged arrowhead **PL. V.5A: 2**
Site:.....'Ein Feshkha
Provenance:...Wall
Expedition:....Hirschfeld (2001)
Material:.....Iron
Dimensions –
Length:...49mm+
Width:....15x15mm

An iron arrowhead was found in the southern wall of the northern unit of main building near strong burning remains (Hirschfeld 2004, 55, Fig. 16: 2). It was associated with the destruction of the building that according to Hirschfeld came to ruin in the Second Revolt (*ibid.*). The corroded head seemingly belongs to the bodkin type. Parallels from the First Revolt are reported from Meroth (III.1/I.1, 4-6), Gamala (III.3/I), and the Site of the Caves (III.5/I.1-35). Second Revolt's contexts: Sandal Cave (V.14/I.1) and the Spear Caves (V.17/I.1). See also the ROM collections (VI.5/I.1).

V.6 – Bethther

Map ref.: 1628 1264

Other names: Bether; Betar; Battir; Bettir; Bittir; Beth-Ter; Beitar; Khirbet el-Yehudi (lit.: the ruins of the Jews)

PL. V.6-V.6C

Reference: *TIRIP*, 86-87

Geography

The site of Bethther is situated at the head of a hill, some 700m above sea level. It rises 150m above the riverbed of Wadi e-Secca (Nahal Refaim), which encircles the site from three winds (**PL. V.6: 1-2**). The relatively comfortable access from the south was blocked by an 80m long *fossa*, 5m deep and 15m wide. A spring, ein-Jama, is located 700m to its south, near which a Latin military inscription was discovered (see below).

History

Known as the fort of the leader of the Second Revolt (Eusebius, *Historia Ecclesiastica* 4.6.3; PT Tann 4 68_d-69_a; Git 57_a-58_a; *Lam R* 2), the site of Bethther was in the last century-and-a-half the focus for archaeological surveys and several limited-scale excavations (Ussishkin 1992, 260, notes 1-10, Fig. 1).[71] The excavations of Ussishkin concentrated in the fortification of the mound and determined their date to the time of the Second Revolt (**PL. V.6A:1**; *ibid.*, 260-275; Ussishkin 1993). In addition to the documentation of a fortification line, building remains and caves on the mound, a large siege system was identified around the site along with one milestone at its foot (Thomsen 1917; *CIL* III, no. 14155.2) and a rock-cut Latin inscription near the spring (Clermont-Ganneau 1899, 465). The latter names detachments of *legio V Macedonica* and *XI Claudia*.[72]

Two camps (A-B) were observed to the south of the mound. In addition, several more compounds (C-F) that served as hill top camps were located at strategic controlling points of the surrounding ridges (Kochavi 1972, 24; 37, site 9; 38, site 16; 40, sites 23 and 26; Kennedy and Riley 1990, 103-104, Fig 50). The remains of a 4km long circumvallation (Mor 1992, 134) were mapped on ground and are partly visible on air photographs (Alt 1927; Schulten 1933; **PL. V.6: 2**), known in the rabbinical sources as '*karqom* (כרקום) of Bethther' (T Yeb 14.8; T AZ 2.7; AZ 18_b).

According to the Talmudic and Midrashic sources the length of the siege of Bethther was three-and-a-half years (PT Taan 4, 68d; *Ecc R* 2,2), which accords well the acceptable duration of the entire revolt (Stern 1980, 400ff). The horrid results of the revolt were embodied, among others, in the descriptions of the fate of Bethther (PT Taan 4, 68d; *Ecc R*

[71] The first modern survey of the site was conducted by Guérin in 1863 (Guérin 1868-1869, 387-395).
[72] For the varied interpretations of the inscription – Stern 1980, 399.

2,2). Although most of these narrations are clearly *topoi* of a defeat, one description that details the construction of a fence from the bones of Bethther's victims may has a grain of truth in it, representing an actual *tropaeum*.[73]

The major occupation stage was clearly during the Early Roman Period, as is attested in the culture material and the architectural remains (Zissu 2001, 103-104). The location of the Second Revolt's fort was clearly determined (Carroll 1925, 91-97; Ussishkin 1992), unlike the boundaries of the settlement of the Second Temple period. The pottery from the excavations of the fort was from the 1st – early 2nd centuries AD (Singer 1993). Pottery sherds from the Iron age, Persian, Hellenistic and Early Roman Periods were collected at the site by Carroll. Few sherds from the Late Roman, Byzantine and Arabic periods were also gathered at the site. In light of the above we appear to be on safe ground assuming that most of the *militaria*, discussed below, originated in the Roman siege, as evidently were the objects unearthed in the excavation of Ussishkin.[74]

Militaria

Despite the fact the site has been little excavated, a relatively large number of military equipment items, of varied categories, were unearthed at Bethther. Some of the objects were gathered in the surveys of Clermont-Ganneau, Alt and Carroll and during the excavation of Ussishkin. Others were unearthed as a result of agriculture activities of the inhabitants of the village Batir and through robbery excavations. The most significant find was an assemblage of about 100 iron objects that was acquired by Father Mauritius Gizler, head of the Museum of the Benedictine monastery of Dormitio St. Mariae, Jerusalem, in 1910 (Schroeder 1935, S. 57). Two decades latter, this collection was bought by the National Museum of Bezalel and was exhibited on three occasions to the public. It contained domestic utensils, as well as a collection of weapons (Kirshner 1946, 153-154), the current whereabouts of most of which is unknown. Some of the metal production tools are in the possession of the IM. The report of Dowling mentions in general the discovery of *militaria* (below).

Stone projectiles and a single scale were uncovered in the sole scientific excavation carried out at the site, by Ussishkin.

Catalogue

B. Armour

Lorica squamata

[73] Due to length considerations of the thesis, I will discuss this theme separately elsewhere.

[74] Comprehensive reviews of bibliography: Schäfer 1981, 136-193; Kennedy and Riley 1990, 100-104; Mor 1992, 133-136; Ussishkin 1992, Ussishkin 1993; Zissu 2001, 103-104.

1. Bronze scale **PL. V.6A: 2**

Site:.....Bethther
Expedition:.....Ussishkin
Provenance: .....Surface find
Excavation no.:...2452/מ
Dimensions –
Length:.....27.5mm
Width:.....13mm
Thickness:.....0.3mm
Diameter of holes:...2mm
Thickness of wire:....1.0mm
Weight:.....1.0gr+

During Ussishkin's excavation, a single copper-alloy scale was discovered on the surface, the publications of which it has escaped.[75] The well-persevered scale (von Groller's type 24)[76], is made of a thin copper-alloy sheet, in all likelihood brass. It has straight edges with a convex bottom and flat surfaces. Four couples of holes for attachment were pierced in the middle of each of the scale's edges next to its perimeter, the two laterals of which still retain the bronze linking wiring. The upper and lower pairs of holes were presumably used for the lacing of the scales to the backing.

Scales that can be dated to the Second Revolt are known from only two more sites. In both the hoard from Hebron's vicinity (V.31/B.2-3) and an unknown Judaean Desert cave (VI.2/B.1)[77], the scales are flat and lacks the prominent midrib that was a dominant feature of the scales used in the late 1st century BC – mid 1st century AD. Scales from the 2nd century AD are further known from Tel Megiddo (V.4/B.1-4) and from Legio (V.3/B.1). The 2nd century AD scales exhibit a growing emphasize over the attachment of the single scale. This technique provided an enhanced protection, though destined the *lorica* to be less flexible.

E. Shields

1. Reinforcement/grip iron band **PL. V.6C: 1G**

The Bezalel collection contained an iron band that was published as a scale beam (Kirshner 1946, 159, Fig. 3, left – third from above). This object is in fact a shield handgrip or a reinforcement band. It features the typical fastening rivet and the circular flat end, a small part of which has survived. For discussion of this fitting: Vol. I, pp. 88-89.

Dimensions –
Length:.....300mm+
Width:.....17mm
Thickness:.....3mm
Diameter of rivet's head:...15mm

[75] I am indebted to Prof. David Ussishkin for granting me the publication of the object and providing the drawing and photo of the object.
[76] Though the scale under discussion is made of copper-alloy rather than iron.
[77] Now in Hecht Museum, Haifa (VI.2).

H. Shafted arms

1. Socketed *pilum* **PL. VI.8: 2**
Site:.....Bethther
Provenance:.....Present of Dr. Reifenberg (29.04.1946)
Collection no.:...4997
Dimensions –
Length:.....245mm
Length of head:.....155mm
Length of socket:.....90mm
head:.....14x11mm
Diameter of socket:...27mm (external)

In the collection of the Hebrew University, Jerusalem. An iron socketed head of a *pilum*. The socket is split and seemingly exhibits a riveting hole. See next item.

Parallels: Nahal Yattir Site (V.33/H.1); Augusta Raurica (CH), (Deschler-Erb 1999, No. 51, Taf. 4).

1. Socketed *pilum* **PL. V.6B: 1A**
Site:.....Bethther
Provenance:..... Dormitio St. Mariae, Jerusalem
Dimensions –
Length:.....170mm

The collection of metal implements bought from villagers in Bethther Dormitio St. Mariae, Jerusalem retained in addition to iron bolt heads and possible bodkin arrowhead, also a single socketed *pilum* head, erroneously identified as chisels (Kirshner 1946, 159).

Parallels – see previous item.

3. Iron spearhead (not illustrated)
Site:.....Bethther
Provenance:.....Bought from 'The Holy Land Antiquities', 1973 (item no. 148)
Collection no.:...6898

The collections of the Hebrew University retains a spearhead that is reported to origin at Bethther. Appears to be akin to the next item.

4. Iron spearhead (not illustrated)
Site:.....Bethther
Collection no.:... PAM 1374 (Case U)

An 'iron spear-head with hollow socket from Bittir (?)' is exhibited in the PAM (Case U – Inv. No. 1374; PAM 1943, 63). Though the item is part of the Byzantine display, its characteristics and the diminishing place of the Byzantine remains at the site clearly suggest the head is of Roman date. Very similar to previous item.

I. Archery

Arrowheads

Iron arrowheads are reported to be uncovered, during agriculture activities, by local inhabitants in the early 20th century (Dowling 1907, 297); their present whereabouts is unknown. Kirshner further mentions the discovery of arrowheads (Kirshner 1946, 153). The only modern excavation, by Ussishkin, has yielded two iron trilobite heads.

Iron trilobate arrowheads

1. Iron trilobate arrowhead **PL. V.6A: 3**
Site:.....Bethther
Provenance:.....Wall (tower's head)
Expedition:.....Ussishkin
Excavation no.:...2443 – מ / Area A, Locus 8, basket 60
Dimensions –
Maximum length:...36mm+
Length of tang:.....5mm+
Width of wing:.....6.5mm
Weight:.....2.93gr+

Very corroded trilobate arrowhead. Small part of its tang survived. It was uncovered in Ussishkin's excavations in Area A, on-top of the semi-circular tower (Ussishkin 1992, 270, Fig. 23). See next item.

2. Iron trilobate arrowhead **PL. V.6A: 3**
Site:.....Bethther
Provenance:.....Wall (tower's head)
Expedition:.....Ussishkin
Excavation no.:...2444 – מ / Area A, Locus 7, basket 60
Dimensions –
Maximum length:...40mm+
Length of tang:.....2mm+
Width of wing:.....7.0-8.5mm
Weight:.....3.7gr+

Very corroded example. It was uncovered in Ussishkin's excavations in Area A, on-top of the semi-circular tower (Ussishkin 1992, 270, Fig. 23). See previous item.

Iron bodkin arrowheads

1. Iron bodkin arrowhead **PL. V.6B: 1M**

The collection of iron heads, erroneously identified as minting tools (see below V.6/M.4), retains one head that appears to be a square-sectioned arrowhead.

K. Sling

Slingshots

Thirty-six stone projectiles were uncovered at Bethther, most of which on the head of a tower in the city's wall during Ussishkin's excavations.[78] The data of this group is provided below:

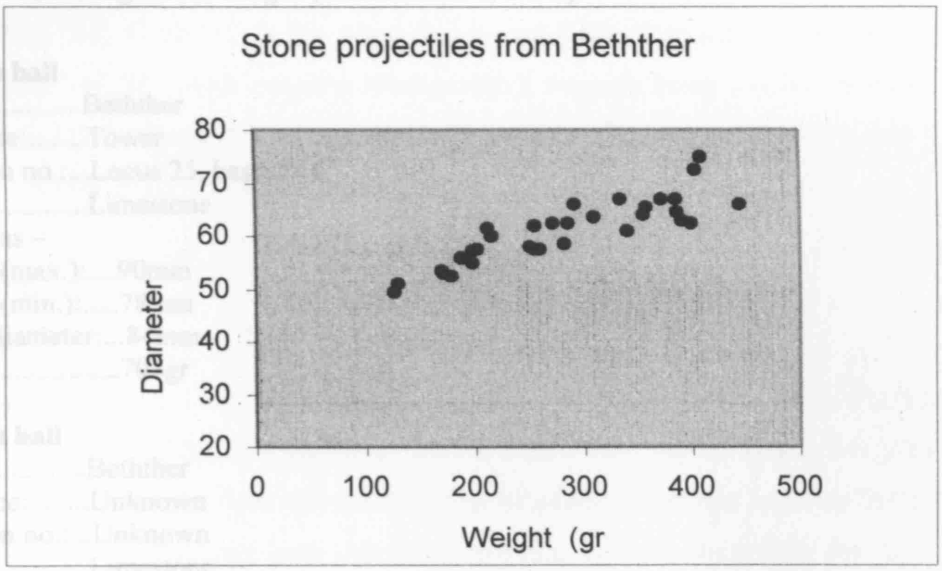
	Excavation no.	Weight (gr)	Maximum diameter (mm)	Minimum diameter (mm)	Average diameter (mm)	Type of stone
1	L.25 B.70	340.5	65	57	61	Flint
2	L.25 B.44	404.32	80	65	72.5	Limestone
3	L.25 B.44	334.72	74	60	67	Flint
4	L.25 B.44	355.33	66	62	64	Limestone
5	L.25 B.44	372.74	72	62	67	Flint
6	L.25 B.44	198.38	62	53	57.3	Limestone
7	L.25 B.44	286	67	58	62.5	Limestone
8	L.25 B.44	–	54	–	–	Limestone
9	L.25 B.44	202.83	60	53	57.5	Limestone
10	L.25 B.44	250.62	63	53	58	Limestone
11	L.25 B.44	172.09	56	50	53	Limestone
12	L.25 B.44	212.32	66	57	61.5	Limestone
13	L.25 B.44	130.15	54	48	51	Limestone
14	L.25 B.44	178.64	56	49	52.5	Limestone
15	L.25 B.44	283	61	56	58.5	Limestone
16	L.25 B.44	215.7	67	53	60	Limestone
17	L.25 B.44	272.16	67	58	62.5	Limestone
18	L.25 B.44	310	67	60	63.5	Limestone
19	L.25 B.44	254.89	67	57	62	Limestone
20	L.25 B.44	189.39	59	53	56	Limestone
21	L.25 B.44	187.85	59	53	56	Limestone
22	L.25 B.44	198.23	59	51	55	Limestone
23	L.19 B.32	399.81	72	53	62.5	Limestone
24	L.19	391.13	72	54	63	Limestone
25	L.26 B.50	292.18	69	63	66	?
26	L.26 B.58	259.90	61	54	57.5	?
27	L.27 B.54	386.47	75	54	64.5	?
28	L.28 B.42	169.62	61	46	53.5	?
29	87	126.84	56	43	49.5	?
30	Surface	254.92	62	53	57.5	Flint
31	Unknown	–	66	–	–	?
32	Unknown	444.14	72	60	66	Flint
33	Unknown	358.11	70	61	65.5	Flint
34	Unknown	385.85	72	62	67	Flint
35	Unknown	–	50	–	–	Limestone
36	L.23 B.47	409.47	80	70	75	Limestone

The data in this table and the following graph indicate that the stone diameter was rather uniform (60.78mm). The weight of the shots clusters in three main groups:

[78] I thank Prof. Ussishkin for granting me access to the material. Carroll refers to the uncovering of a stone ball, 50mm in diameter, during his survey of the site (Carroll 1925, 90).

1. 170-215gr
2. 250-310gr
3. 335-410gr

The average measure of the last two groups equals 1-*libra* (327.45gr).



M. Torsion artillery

Ballista balls

Reports about artillery ammunition was noted by several scholars who surveyed the site. Dowling generally notes the find of 'stone balls' (Dowling 1907, 296). Three limestone *ballista* balls were uncovered by Ussishkin in the excavation of the wall (**PL. V.6B: 2**). Germer-Durand found at the foot of the site a large *ballista* ball, 300mm in diameter (Clermont-Ganneau, 1899, 470). The stone weighed 41kg, which is just above 120-*libra* (39.3kg) or just under 100-mina (43.66kg).[79] The employment of artillery also echoes in the Midrahsic literature. Describing the power of Bar-Kokhba, *Midrash Rabbah to Laminations* tells us:

> 'And what used Bar Kozeba to do? He would catch the *ballista* balls by one of his knees and hurl them back, killing many of the foes' (*Lam R* 2.2).[80]

An exotic information that preserves the historical memory of the Roman siege of Bethther, is found in an Arabic legend, was mentioned by several surveyors (Hanauer 1894, 149; Caroll

[79] For the ancient lists of calibres of *ballistae* see: Section II – M.3.

[80] 'מה היה כחו של בן כוזבא, אמרו בשעה שיוצא למלחמה היה מקבל אבני בליסטרא באחד מארכובותיו, והיה ניתזת ממנו והולכת והורגת כמה אנשים' (איכה רבה (בובר) פרשה ב).

1925, 86-87). The legend refers to a large worked stone situated on a hill, 640m[81] south-south-east of the mound. According to the locals, the stone (*Hajer el-Mangaliq* = the stone of the *onager*) marks the place from where, it is believed, the prophet (*el-Malek a-Zaher*) bombarded the Jews at Bethther. The Arabic word derives from the Greek *μοάγκων* – the one-armed machine mangonel or *onager* (Marsden 1971, 249ff).[82]

1. *Ballista* ball
Site:.....Bethther
Provenance:.....Tower
Excavation no.:...Locus 25, basket 44
Material:.....Limestone
Dimensions –
Diameter (max.):....90mm
Diameter (min.):.....78mm
Average diameter:...84mm
Weight:.....704gr

2. *Ballista* ball
Site:.....Bethther
Provenance:.....Unknown
Excavation no.:...Unknown
Material:.....Limestone
Dimensions –
Diameter (max.):.....72mm
Weight:.....310gr +
Estimated weight:...~620gr

Sliced in half.

3. *Ballista* ball
Site:.....Bethther
Excavation no.:...Locus 23, basket 37
Material:.....Limestone
Dimensions –
Diameter (max.):.....88mm
Diameter (min.):.....74mm
Average diameter:...81mm
Weight:.....551.56gr

Catapult bolts

The thirteen iron 'pegs' from the Bezalel collection, which were interpreted as chisels (Kirshner 1946, 155, Fig. 3), appears to be tanged *catapult* bolts. In addition, a photo of bolt heads from Bethther is found in the archives of the Mandatory Palestine Department of Antiquities (Inv. no. 21.307 – file 25).[83]

[81] In the publications: 2/5 of a mile.
[82] The term is not a distortion of the Latin *mangonel* as claimed by Vilnay 1956, 172, note *.
[83] I thank Boaz Zissu for bringing the photo to my attention.

4. Group of 13 tanged bolts **PL. V.6B: 1B-L**

The lengths of the tanged bolts vary between 70mm and 170mm. Parallels are documented in Meroth (III.1/M.2) and Gamala of the First Revolt, and in and the Cave of the Pool (V.20/M.1) from the Second Revolt. In the East: Dura-Europos (SY) (James 1990, 94, Nos. 41-51, 63-64), Qasr Ibrim (EG) (James and Taylor 1994) and Bastam (IR) (Kleiss 1972, 52, Abb. 49, Nos. 3-5, 8, 10-11). In the West: Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 421-458, Taf. 22 – with extensive bibliography); Augusta Raurica (CH) (Deschler Erb 1999, Nos. 1-35); Saalburg (DE) (Baatz 1966, 205, Abb. 1; 2); Newstead (UK) (Curle 1911, 189, Pl. XXXVIII: 9-11)[84]; Caerleon (UK) (Nash-Williams 1932, 71, Figs. 20-21).

P. Varia

Caltrops

1. Iron barbed caltrop **PL. VI.1: 1**

The collections of the IM contain an iron caltrop.[85] Four barbed iron spikes joined at their bases by ~33° angle, form this device. This structure insures that however the caltrop will be tossed, it will always have one spike pointing upwards. Originally the item was erroneously noted in the *IM* files as a tripod stilt, which is said to be used in the potter kiln for firing vessels.[86] The small artefact (height: 36mm; Weight: 8.31gr) was part of the Bezalel collection, which was donated to the IM in 1950. There seems to be sufficient ground to assume it had originated in the collection of the monastery of Dormitio St. Mariae of Jerusalem that was bought in the 1930's. The collection is known to contain weapons and production tools assemblage from Bethther, the major fort of the Second Revolt. To the best of my knowledge, it is, to present, the sole example reported from the Eastern Empire.

Such wicked implements of iron spikes were used in the fields of battle as early as the end of the 4th century BC. At that time, the elephant presented one of the major threats one could face in combat. In order to stop or harm it, some of the devices were aimed to hit the weakest, or more likely the most sensitive, point of the elephant, that is, the soft soles of its feet. An injured elephant tends to panic and thus can cause serious damage to its own forces. At the battle of Megalopolis (318BC) the besiegers placed, on the trail of the elephants, wooden beams into which spikes were hammered (Diodorus, 15.72). Diodorus also notes the employment of spiked chains that were hurled under the elephants' feet, during Demetrius Poliorcetes's defeat at Gaza (312BC) (19.82, 85).

[84] Erroneous identification in Pl. XXXVII: 11.
[85] Inv. No.: 77.31.1022. Additional registration number reads: M B 93.
[86] Duddy Mevorach, *pers. comm.*; for tripod stilts from Israel *cf.* Stern 1998, 24.

The spike as an anti-human device is mentioned in Caesar's *BG*. In the series of booby traps set by Caesar's soldiers around Alesia, the exterior obstacle line was composed of barbed iron spikes known as *stimulus*:

> 'In front of all these, logs a foot long, with iron hooks firmly attached, were buried altogether in the ground and scattered at brief intervals all over the field and these they called 'spurs' (*stimuli*)' (*BG* 7.73).

Spurs that match this description were found at Alesia (Connolly 1988c, 292). Suchlike spurs were fixed onto short wooden logs and planted by the soldiers, so the attackers could hardly see them. Napolèon III had produced a diagram that illustrates the device's function (Napolèon III 1865-66, Pl. 27). Additional illustration of the *stimulus*, by Peter Connolly, differs from that of Napolèon III in two points; the spike is fixed with the barb turned away from the attackers, while the log is inserted slantwise into the ground (Connolly 1988c, 292; right: 1). Connolly's version seems to be more efficient and apt to its task. The barb that crowns the spike was intended to injure the soldier foot, but moreover it would have immobilized the foot soldier, ensuring that it will be very difficult to extract the device from ones sole. This would have certainly limited the mobility of a soldier, and his struggle to remove it must have exposed him to the foe's fire. In addition, being trapped, he would become an obstacle for the following soldiers; therefore, a success in slowing one soldier, would have created a bottleneck in the stream of the attacking forces.[87] Caesar's testimony, clearly reflects the device function:

> 'While the Gauls were some distance from the entrenchment they had more advantage from the quantity of their missiles; then, when they came up closer, they were soon caught unawares on the 'spurs'...' (*BG* 7.82).

Furthermore, the caltrop was not less effective against mounted animals. During an assault on the trenches, a spike could have well caused the mounts to trample. Indeed, we find in the description of Macrinus's battle against Artabanus (AD217) an evidence for the usage of it as an anti-mount device (Herodian 4.15.2-3).[88]

The forces in Alesia were using as well the simply formed caltrop (Brouquier-Reddé 1997, 279, Fig. 2a).[89] This shape appears to be very popular in the 3rd century AD. The

[87] On the hazards of 'traffic jams' during battle, refer to the first Roman attack at Gamala (*BJ* 4.20ff). Though generated due to a different cause it is an authentic testimony for the phenomenon.
[88] Herodian 4.30.
[89] I find it difficult to accept Brouquier-Reddé's identification of a tripodal ferrous objects with a long forth spike that terminates by a loop, as a caltrop (Brouquier-Reddé 1997, 279, fig. 2b). Although the last feature seemingly improved the potential of hurling it would have buffered the effectiveness of the device not exhibiting a sharp end.

excavations at Caerleon yielded 17 iron caltrops, from a 3rd century AD context (Nash-Williams 1932, Fig. 22). This device was still in use during the Byzantine period up to the Middle Age (Bishop and Coulston 1993, 155). One iron caltrop, very similar to the Caerleon' specimens, has been uncovered in the fort of Hrušica (SI) (Ulbert 1981, 173; 185, Pl. 22). An additional example has been unearthed in Vindonissa (CH) (Unz and Deschler-Erb 1997, 21, No. 291, Taf. 19). A more elaborate form of bronze *tribuli* that has a characteristic central bulbous is reported from Volubilis and Banasa (MR) (Boube-Piccot 1994, 140-141, Nos. 226-230, with ample bibliography).

The structure of the *stimulus* and *tribulus* appears to indicate the tactical intention of their user. The former was used as a stationary weapon. It did not grant its user with much flexibility. Installing this device, i.e. inserting it to the ground, required time. It was seemingly part of a site fortification lines that was to be prepared in advance. The employment of the caltrop, conversely, was by far easier to its user. The ease of usage – hurl and forget – is remarkable. Following a short notice a few soldiers could have spread dozens of caltrops; all needed was a warning in advance of the enemy's approach. It is a portable weapon, which is ready for immediate use, suitable as well for a small garrison. According to Procopius the defenders of Rome have strewn numerous caltrops in front of the open gateways (Procopius 7.24.15). The dominant presence of the *tribuli* in the Late Roman period (particularly during the 3rd century AD) possibly reflects the significant role of riding forces at that time.

In addition, the *stimulus* appears to be far more suitable to wetter conditions than the caltrop is. The latter, on the other hand, is more adapted to rocky or dense soil landscapes. Nevertheless, while it will be impossible for one to use the *stimuli* in rocky terrains, the caltrop will be in fact operational in semi-wet soil or dense sandy environment (Herodian 4.15.2-3).[90] Its physical structure ensured that one point would still protrude from the surface.

The hybrid form of the IM caltrop – of barbed spikes represents a sophisticated structure that have enjoyed most of the advantages mentioned above, perhaps the 'peak of spiked devices' of the Roman world.

T. Cult utensils

1. Cultic shovel (not illustrated)
Site:.....Bethther (?)
Provenance:....Unknown

[90] 'And when the size of the cavalry and the numbers of the camels began to cause them [the Romans] trouble, they pretended to retreat and then threw down caltrops and other iron devices with sharp spikes sticking out of them. They were fatal to the cavalry and the camel-riders as they lay hidden in the sand, and were not seen by them. The horses and the camels trod on them and (this applied particularly to the camels with their tender pads) fell onto their knees and were lames, throwing the riders off their backs' (Herodian 4.15.2-3).

Location:.....Royal Ontario Museum
Dimensions –
Total length:...295mm

In his discussion of the Cave of Letters' finds, Yadin draws the attention to some unpublished cultic shovels, among which he named one that is part of the ROM collections. In the registration card we read that the shovel was bought in Jerusalem and 'said to come from Bittir'. The following description was given by Yadin: 'A shovel; the rim of the sides on the pan are grooved. There are two ear-brackets. Found at Bettar (?). Traces of the soldering are visible. The columnar handle is partly fluted; near the joint with the pan, the handle terminates in a stylised Corinthian capitol. At the other end of the handle, there are a knob and a support, as on our No. 5. The over all length is 29.5cm' (Yadin 1963a, 57: d).

W. Production tools

The production tools discussed here were unearthed at the site of Bethther, dated, in all likelihood, to the Second Revolt. Although the exact location of the finds within the site is not known, from the scant information available it seems safe to assume that the assemblage originated in the ruins of the city rather than in the temporary Roman camps. Those finds are of particular interest, in light of the historical information concerning the preparations made by the Jews prior to the revolt, which included arms' production. The group was initially briefly reported by Kirshner, who erroneously associated it with the production utensils of a mint (Kirshner 1946). The tools were part of a metal artefacts' collection that was acquired for the museum of the Benedictine monastery of Dormitio St. Mariae to be later sold to the Bezalel Museum. This assemblage contained weapons as well as metalworking tools, some of which are at present in the IM collection. All in all, it appears to consist of: 2 anvils, 4 tongs, 1 hammer, 1 set and 1 chisel, possibly belonging to a local blacksmith's set of tools. They were reported to be found alongside military equipment (*ibid.*, 154-155) most of which is now lost, though at least 15 objects with military orientation were identifiable among this group. In the East, these finds may be paralleled with the tools of a Byzantine smithy, which was recently excavated in Horvat Ovesh (Aviam and Getzov 1998). For Western examples *cf.* Manning 1985, 1-11, Pls. 1-6. Below are given the available measurements of the objects.

Anvils

1. Block anvil **PL. V.6C: B**
Site:.....Bethther
Inv. No.:...69-20-664
Material:...Iron
Dimensions –
Length:.....95mm
Upper face:....54x46mm
Lower face:...43x40mm

Weight:.....1292.25gr

2. Beaked block anvil **PL. V.6C: A**
Site:.....Bethther
Inv. No.:...69-20-66
Material:...Iron
Dimensions –
Length:.....133mm
Upper face:.....66x66mm
Lower face:.....27x27mm
Length of beak:...64mm
Weight:.....1484.94gr

Tongs

PL. V.6C: H-K

3. Tong
Site:.....Bethther
Inv. No.:...69-20-667
Material:...Iron
Dimensions –
Length:.....430mm
Width of flat gripping faces:...58mm and 35mm
Thickness of handles:.....8mm
Diameter of pin:.....15mm (?)
Weight:.....871.77gr

4. Tong
Site:.....Bethther
Inv. No.:...69-20-668
Material:...Iron
Dimensions –
Length:.....346mm
Width of flat gripping faces:...45mm and 22mm
Thickness of handles:.....8-9mm
Maximum width of handles:....22-23mm
Diameter of pin (two sides):....11mm and 19mm
Weight:.....583.45gr

5. Tong
Site:.....Bethther
Inv. No.:...69-20-666
Material:...Iron
Dimensions –
Length:.....330mm
Width of flat gripping faces:...27mm and 19mm
Width of handles:.....19mm and 22mm
Thickness of handles:.....7mm
Weight:.....362.28gr

6. Tong
Site:.....Bethther
Inv. No.:...69-20-669
Material:...Iron

Dimensions –
Length:.....264mm
Width of handles:.....21mm
Weight:.....243.71gr

Hammers

7. Hammer **PL. V.6C: C**
Site:.....Bethther
Material:...Iron

8. Hammer **PL. V.6C: E**
Site:.....Bethther
Material:...Iron

Sets

9. Set **PL. V.6C: D**
Site:.....Bethther
Material:...Iron

Chisels

10. Chisel **PL. V.6C: F**
Site:.....Bethther
Material:...Iron

V.7 – Herodium

Map ref.: 1728 1193

Other names: Herodion; Giabel Fureidis; 'Frank mountain' **PL. V.7**

Reference: *TIRIP*, 143; *NEAEHL* 2, 618-626

The military history of Herodium (with references to the major publications) and a synthesis of the *militaria* from Corbo's and Netzer's excavation were recently published (Stiebel 2003a).

V.8 – Kh. Ziphiyon

Map ref.: 14145 12125

Other names: Khirbet Sufiya

Geography

The site is located in the centre of a range at the lower Shphelah, south-west of Tel Azeqa (V.11). The ruins occupy an area of some 15 dunams.

History

In the centre of the ancient site of Khorvat Ziphiyon, a hiding complex was discovered in April 1998. Avi Avganim and Boaz Zissu of the IAA documented the complex that suffered from illicit digging (Avganim and Zissu 2001).[91] It consists of a series of hewn underground halls and tunnels for which the surveyors were able to determine three phases of existence (**PL. V.8: 1**).

In the first phase, the inhabitants of the above Hellenistic-Early Roman settlement constructed, for their domestic usage, underground structures and installations such as cellars and water cistern.

During the preparation for the Second Revolt, tunnels that connected the ancient subterraneous cavities were hewn, thus creating a net of tunnels and spaces adapted for the inhabitation of the Jewish rebels. The dating of the complex, other than its nature that is typical to the Second Revolt days (Kloner and Tepper 1987), was further confirmed by the indicative pottery that was there found (Avganim and Zissu – *pers. comm.*; Avganim and Zissu 2001).

The last usage of the complex was made in the Byzantine and Early Arab periods, as we learn from the culture material evidence and three incisions of crosses spotted on the cistern and one of the tunnel's walls.

Militaria

Our main interest lies in the second phase, which has yielded amongst other a fragment of a limestone *ballista* ball (Avganim and Zissu 2001, 89 and 69*). The ball was found in a water cistern that served as a junction for several tunnels. It was unearthed in the illicit diggers' sifting hips, created from the soil that has been removed from the tunnels. Found mixed with clean second century pottery it was correlated with the second phase, dated to the Second Revolt, a period for which such evidence is quite meagre.

[91] I am most grateful to Avi Avganim (IAA), the site's excavator, for informing me of the find. I wish to express my gratitude to Boas Zissu (IAA) for the permission to study the unearthed *ballista* ball, and the supply of the site's details.

Catalogue

M. Torsion artillery

Ballista balls

1. *Ballista* ball (not illustrated)
Site:.....Khorvat Ziphiyon
Provenance:.....Hiding complex (water cistern)
Excavation number:...Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...138mm
Minimum diameter:....133mm
Weight:.....2143.66gr+
Estimated weight:.....~4287gr

The limestone *ballista* ball was found sliced in half. The ball was unearthed in a water cistern, which during the Second Revolt has served as a junction for several tunnels of the Hiding complex. Though it was uncovered in the soil accumulated there by illicit diggers, the excavators are certain in its correlation to the phase of the hiding complex (Avganim and Zissu – *pers. comm.*).

The estimated weight of the shot (*c.*4300gr = 10-mina), places it in the Greek standard that has been seemingly used by the Roman artillery during the 2nd century (see above), following the practice that was employed already during the First Revolt (Holley 1994, 363).

V.9 – Khirbet-el 'Aqd'

Map ref.: 1508 1382

Other names: Horvat 'Eqed

PL. V.9

Reference: *TIRIP*, 65; *NEAEHL* I, 416-417

Geography and history

The site of Khirbet-el 'Aqd' is situated on the peak of a steep hill in the western Shephelah, some two kilometres east of Emmaus. Perennial flowing springs are situated at the foot of the hill (**PL. V.9: 1**).

According to the excavators, the site was fortified during the Hellenistic period to be destroyed during either Varus war (AD4-5) or the First Revolt as attested by a clear conflagration layer. However, the most prominent remains of the site date to the Second Revolt, among which we may count two hiding complexes (**PL. V.9: 2-3**). During that period the ruined wall was reconstructed. All the military equipment excavated in the site is reported to originate in Second Revolt contexts. The context of discovery is of importance for, like in Ussishkin's excavation at Bethther, the *militaria* is directly associated with the fortifications. Emanuel Damati conducted a salvage excavation in the mouth of hiding complex No. 1 (Damati 1977, 61). The site, including the hiding complexes was excavated under the management of Mordechai Gichon between 1978-1980 and 1983. Khirbet-el 'Aqd' presents a typical fortified settlement of the Second Revolt, in which hiding complexes were incorporated within the settlement walls.

Militaria

A substantial amount of trilobate iron arrowheads was discovered in the site (42 specimens). In addition, two iron heads of shafted weapons are noted among the finds. From the photographs that illustrated Gichon' article, one may identify one javelin head and a tanged *pilum* head (Gichon 1983, 32). Gichon notes also the discovery of a single *ballista* ball and slingshots. The artillery ball is of interest, as very few artillery missiles are known from the Second Revolt contexts. In addition, an article concerning the numismatic discoveries at the site refers to the uncovering of several armour scales (Kindler 1984, 172).

Catalogue

B. Armour

Lorica squamata

The discovery of armour scales is mentioned by Kindler (Kindler 1984, 172). No further details are provided. For scales dated to the Second Revolt period, see 'Azeqa (V.11/B.1),

Bethther (V.6/B.1), the hoard from the Hebron district (V.31/B), Hecht Museum (VI.2/B), Legio (V.3/B.1), Megiddo (V.4/B.1-4) (Vol. I, p. 40ff).

H. Shafted arms

Pila

1. *Pilum* head **PL. V.9: 4D**
Site:.....Khirbet-el 'Aqd'
Context:.....Destruction layer – wall
Expedition:.....Gichon (1979-1980)
Excavation number:...Unknown
Material:.....Iron

A tanged pilum head, with a broken haft. *Pila* heads from the 2nd century AD were reported from the Murabba'ât Caves (V.16/H.1) and Yoqne'am (II.2/H.1). A socketed head was found at Bethther (V.6/H.1). An early tanged head was found in Samaria (I.6/H.1).

Spearheads

2. Iron spearhead **PL. V.9: 4C**
Site:.....Khirbet-el 'Aqd'
Context:.....Destruction layer – wall
Expedition:.....Gichon 1979-1980
Excavation number:...Unknown
Material:.....Iron

An iron leaf-shape head was unearthed in the destruction layer that is associated with the site's fortifications. Its photograph was included in a preliminary report under the erroneous title of an iron arrowhead (Gichon 1983, 32). Such a head was uncovered at Masada (III.19/H.1).

I. Archery

Iron arrowheads

A wealth of iron arrowheads was excavated at Khirbet-el 'Aqd' (**PL. V.9: 4A-B**; Gichon and Vitale 1991). The publishers provided an over-detailed typology that proves to be of little typological and chronological significant, particularly as it appears to disregard the corrosion effect (Stiebel 2003a, 216-217). The invalidity of Gichon and Vitale's typology is further exemplified by the fact that all alleged types appears in the Second Revolt, whereas some of the types are present in the Hellenistic period, absent in the 1st century Ad and re-appear in the Second Revolt. Re-examination of the available photos or drawings indicate that only small part of the 42 arrowheads may be classified. According to the classification offered by us, the arrowheads cluster as follows:

No.	Gichon and Vitale's typology	Date (Gichon and Vitale)	My typology
1	A	Second Revolt	–
2	A	Second Revolt	Type C
3	A-B	Hellenistic + Second Revolt	Unavailable
4	A-B	Hellenistic + Second Revolt	Unavailable
5	A-B	Hellenistic + Second Revolt	Unavailable
6	A-B	Hellenistic + Second Revolt	Unavailable
7	Ba	Hellenistic + Second Revolt	Unavailable
8	Ba	Hellenistic + Second Revolt	Unavailable
9	Ba	Hellenistic + Second Revolt	Unavailable
10	Ba	Hellenistic + Second Revolt	Unavailable
11	Ba	Hellenistic + Second Revolt	Unavailable
12	Ba	Hellenistic + Second Revolt	Unavailable
13	Ba	Hellenistic + Second Revolt	Unavailable
14	Ba3	Second Revolt	Type B
15	Ba3	Second Revolt	Unavailable
16	Ba3	Second Revolt	Type B
17	Ba3	Second Revolt	Unavailable
18	Ba2	Second Revolt	Unavailable
19	Ba2	Second Revolt	Type B
20	Bb	Second Revolt	Unavailable
21	Bb1	1st century AD + Second Revolt	Type C
22	Bb1	1st century AD + Second Revolt	Type C
23	Bb1	1st century AD	Type C
24	Bb2	Second Revolt	Unavailable
25	Bb2	Second Revolt	–
26	Bb2	Second Revolt	Unavailable
27	Bb2	Second Revolt	Type E
28	Bc	Second Revolt	Type E
29	Ca	Second Revolt	–
30	Ca	Second Revolt	Unavailable
31	Ca	Second Revolt	Type E
32	Ca	Second Revolt	Unavailable
33	Ca2	Second Revolt	Unavailable
34	Ca2	Second Revolt	Type a
35	Cb	Second Revolt	Unavailable
36	Cb	Second Revolt	Unavailable
37	Cb2	Hellenistic + Second Revolt	–
38	Cb2	Hellenistic + Second Revolt	Type C
39	Cb3	Second Revolt	–
40	D	Second Revolt	Unavailable
41	D	Second Revolt	Type B
42	D	Second Revolt	Type B

The fourteen arrowheads, are grouped as follows:

Type A	Type B	Type C	Type D	Type E
1	5	5	-	3
6.6*%	33.3*%	33.3*%	0%	20%

The commonest type in Herodium is type C, while the rarest is Type E (*ibid.*) Type D is missing.

K. Slingshots

The discovery of slingshots at the destruction layer from the Second Revolt is mentioned by Gichon (Gichon 1983, 36) and Kindler (Kindler 1984, 172). No further detail was provided.

M. Torsion artillery

Ballista balls

1. *Ballista* ball (not illustrated)
Site:.....Khirbet-el 'Aqd'
Context:.....Fortifications (destruction layer)
Expedition:..... Gichon 1979-1980
Excavation number:...Unknown
Material:.....Stone
Dimension –
Diameter:.....250mm
Weight:.....Unavailable (estimated: *c.* 22kg)

A single stone ball is reported from the site (Gichon 1983, 36). Few balls may be dated with certainty to the period of the Second Revolt, among which one can note Kh. Ziphiyon (V.8/M.1). The diameter of the ball suggests it belonged to the large calibre category; the weight of a ball from Masada of the same diameter was 22kg (Holley 1994, Appendix B).

V.10 – Site of 'Bypass Shoham' (road 444) Map ref.: 1455 1556

Other names: Hadid (?), Nablata (Anablata) (?) **PL. V.10**

Geography

The site is situated on a moderate slope in the western hills of the Shphelah. It dominants the coast and over an ancient road which is oriented north-south. From the site one may observe Tel Hadid (to the south), and Lod (in the south-west).

History

The site was excavated by Dahari and Ad (IAA) in 1995-96, during a salvage excavation prior to the construction of road 444. Seven levels of occupation were revealed, dating from the end of the Iron Age up to the Middle Ages. A fortified manor house with three fortified buildings were erected in the early 2nd century BC (stratum VII). During the Hasmonean reign, possibly under the reign of Simon, a fortress superseded the previous constructions (stratum VI). The excavators suggested that fortress came to ruins in 63BC, during the campaign of Pompeius. The site was resettled during the 1st century AD (stratum V) and was expanded, of which six dunams were uncovered (**PL. V.10: 1**).[92] The walls of the fortress were reconstructed, a tower was added, as well as several buildings, two bathhouses and industrial and storing facilities. Dahari and Ad identifies the site with Hadid, though Zissu raises the alternative identification of Nablata (Dahari and AD 2000; Zissu 2001, 19-21; see *TIRIP*, 138).

Towards the Second Revolt changes were made in the arrangement of the rooms and installations. Hiding complexes were hewn, using many of the water cisterns, and the inhabitants built underground storing installation for food. The sited was violently destroyed in the Second Revolt. In one hiding complex the bone of over 20 individuals were found, more than half of which were women and children under the age of 15. This statistics clearly points to a violent death.

Militaria

Several objects were found in direct relation with the Second Revolt period: a Collared javelin head, typical of this period, while a heavy spear was unearthed in the mouth of the hiding complex. Both appear to be typical of the Jewish armament (Vol. I, 218ff). A rare scale armour is further reported. In addition, we should note the discovery of a *fibula* from the AVCISA type that bears such an inscription. Although not included in the dissertation, in Palestine such brooches appear to be associated directly with the Roman presence. The most

[92] The result of salvage excavation that was conducted in 1999 at the west perimeter of the site, suggest that the size of the settlement reached the extant of some 12 dunams (Zissu 2001, 20).

prominent example derives from Masada where several such *fibulae* were discovered, one of which on the assault ramp, clearly associated with the Roman military presence at the site.

Catalogue

B. Armour

Scale armour

1. Scale **PL. V.10: 2**
Site:.....Site of 'Bypass Shoham'
Expedition:.....Dahari and Ad (1995)
Excavation No.:...B6497
Material:.....Copper alloy
Dimensions –
Length:...22mm+
Width:....22mm

The flat scale is not complete, missing its upper rim (Type 12). Two lateral holes for attachment are spaces at the lower part, while the remnants of two more are seen in the upper section. The scale exhibits a double curving bottom. It is not clear whether this feature is a production fault. Such an element has a close parallel in Mainz (Behrens 1913-1914, 67-68, Abb. 2.1).

H. Shafted weapons

1. Collared javelin head (not illustrated)
Site:.....Site of 'Bypass Shoham'
Expedition:.....Dahari and Ad (1995)
Excavation No.:...Area A; L236; B2092
Material:.....Iron
Dimensions –
Total length:.....47mm+
Length of tang:.....16mm
Length of head:.....31mm+
Width of head:.....11mm
Thickness of collar:.....6.5mm
Maximum thickness of blade:...5mm
Thickness of tang:.....4mm

This fragmented iron head belongs to the collared javelin head, which is the most typical of the Second Revolt. About half of the blade is missing. The head is asymmetrical in section, its flat back face indicate that the head was cast. Parallels are known from the Refuge caves of the Judean Desert: The Large Caves Complex (V.15/H.1), Wadi Murabba'ât Caves (V.16/H.4), Cave FQ37 (III.18/H.1) and the Tetradrachm Cave (V.25/H.1).

2. Heavy spear **PL. V.10: 3**

Site:.....Site of 'Bypass Shoham'
Expedition:.....Dahari and Ad (1996)

Excavation No.:...Area A; L998; B8433
Material:.....Iron
Dimensions –
Total length:.....365mm+
Length of shaft:.....210mm
Length of blade:.....155mm+
Width of blade (corrosion):.....3.5mm
Thickness:.....9mm (11mm corrosion)
Diameter of shaft:.....30mm (proximal) – 24mm (distal)

The heavy spear has a solid shaft. The head of this shock weapon has a very flat lentoid cross-section with no mid-rib. Found in a stone installation in which the mouth of a hiding complex was exposed, it appears to date to the Second Revolt. A similar heavy head was found in Jerusalem (III.12/H.1) in a First Revolt context (AD70), while a Second Revolt dating is given to the heavy spear from Nahal Yattir Site (V.33/H.1).

I. Archery

Copper-alloy socketed arrowheads

1. Copper-alloy socketed arrowhead **PL. V.10: 4**
Material:...Copper-alloy
Dimensions –
Length:...30mm
Width:....14mm

A socketed two winged Scytho-Iranian arrowhead with a midrib, Stern's Type 2b (Stern 1982, 156). This type was employed in Palestine between the 7th and the 4th century BC. Typologically relating to the Persian period, the arrowhead was presumably reused by the rebel forces. Such a phenomenon is known from Masada and a refuge cave of the Judaean Desert (Hecht Museum) (VI.2/I.4) (Vol. I, p. 251).

V.11 – 'Azeqa

Map ref.: 1441 1231

Other names: Azeca; Tell Zakariya

PL. V.11

Reference: *TIRIP*, 72

Geography

Tel 'Azeqa is situated above a major crossroads in the central Shaphelah. This position contributed much to its importance ever since the biblical times. Reaching the altitude of 400m, the site of 'Azeqa rises 120m above the course of Nahal ha'Ela, which runs by.

History

The site of Tel 'Azeqa was excavated between 1898-1899, under the management of Bliss and Macalister (Bliss and Macalister 1902). The British expedition did not uncover any settlement remains that may be attributed to the early Roman period. However, Macalister surveyed a multiple hiding complex, which was discovered on the mound's edges. The complex was re-examined in 1981 by Tepper and Shahar, who defined five separate hiding complexes. All five fall in the typological frame of the Second Revolt hiding complexes (Tepper and Shahar 1987, 171-186).

A road linking Jerusalem with Beit Guvrin (*'Ελευθοπολις*) was constructed by the Romans about AD130, passing close by the mound. The importance of the hiding complex of 'Azeqa lies, no doubt, in its proximity to the Roman road. Cassius Dio notes that the rebelling Jews 'occupied the advantageous positions in the country and strengthened them with mines and walls', a narrative that closely portrays 'Azeqa. Even though the settlement of the early Roman period is yet to be excavated, the surveyors appear to be convinced in its existence. This notion is mainly attributed to the clear linkage between hiding complexes and the structures above, some retaining ritual bathes (Zissu 2001, 158-159). Moreover, Bliss and Macalister uncovered fortified towers and possibly a wall, in the south-west corner of the mound and suggested a Roman-Byzantine date (**PL. V.11: 1**; Bliss and Macalister 1902, 14). Zissu notes the discovery of procurators' coins, as well as from the second and third years of the First Revolt and a Bar-Kochbaic coin (Zissu 2001, 159). On this background the surveyors assigned the complex from 'Azeqa to the days of Bar-Kochba's revolt assuming the existence of a contemporary settlement (Tepper and Shahar 1987, 184-5).

Militaria

A large fragment of iron scale armour cuirass was found in the early and sole archaeological excavation of the famous biblical site. According to the excavators it was uncovered fairly close to the surface, within the boundaries of the compound, thus was

concluded to be of Selucid or Roman date (Bliss and Macalister 1902, 150). On the basis of typological characteristics, the arrangement pattern of the attachment holes, these scales should be dated to the late first century – early second century AD. Moreover, the existence of the hiding complexes at the site, noted above, clearly assigns the cuirass to the Second Revolt. Further dimension of the find's significance lies in the fact that the corroded lump contained a second type of scale, which appears to relate to edging part of the same cuirass (*pteruges* or sleeve).

Catalogue

B. Armour

Lorica squamata

1. Fragment of cuirass **PL. V.11: 2**
Site:.....'Azeqa (Tel-Zakariya)
Expedition:.....Bliss and Macalister 1898-9
Excavation number:...Unknown
Material:.....Iron
Dimensions –
Scale (2A)
Length:...50mm
Width:....35mm
Scale (2B)
Length:.....50mm
Width:.....32mm
Width (neck):...15mm

Two types of iron scales were found in the same corroded lump of scales. This data is of particular interest as it is a scarce example for the existence of mixed types in one cuirass, a recognized, yet little attested, assumption. The following lines, which were included in the excavation's report, refer to the circumstances of the find:

> 'At a depth of 5 feet in the Tell Zakariya portion was found a large lump of iron fragments corroded together. On separating these we found them to consist of numerous iron scales, which once formed a small part of a cuirass' (*ibid.*, and Fig. 62).

Since no archaeological context is noted in the final report, only a comparative typological study may equip us with a date for the scales. Still, Bliss and Macalister wrote in the report, that:

> 'From the slight depth at which it occurred, we relegate this cuirass to a late period of the tell, Seleucidan or Roman' (*ibid.*).

The conclusion that the find should be dated to the classical period was reached on the basis of stratigraphic considerations, at least in the standards of that time. Indeed, compared with finds from the west, there is no doubt that the scales are typical of the Roman period (see below). The excavators provided a detailed description of the find:

> 'The scales (which measure 5 centimèters in length by 3.5 centimèters across) are straight-sided square at the top, and rounded at the bottom, and are slightly bent vertically, so as to be concave to the body. Four holes, arranged in a square, are pierced in the centre of the top of each scale, and two, one above the other, in the middle of each side. Adjacent scales are lapped so as to make the side holes correspond, and are secured by a U-shaped rivet of bronze, the free ends of which are bent over on the inner surface. By this, a series of rings was formed, each of which was then probably sewn on cloth backing the sets of four holes at the tops of the scales being intended for the thread. The latter detail, it is hardly necessary to say, cannot be proved directly, as every trace of cloth or thread has long since disappeared, but the absence of any evidence of bronze in the neighbourhood of these holes renders this explanation of their use the most probable. In two fragments the edges have been turned over so as to prevent them from cutting. These, in all probability, are portions of the collar. From the absence of any scales of greater than normal curvature, we infer that the arms were left unprotected' (*ibid.*).

First, the employment of iron in the production of scales is of interest, as in Palestine it use is not as common as that of the copper alloy. Only the cuirass from Sepphoris (III.6/B.1), as well as few scales from Gamala (III.3/B.41-43) and the Hebron's hoard (V.31/B.2), were made of iron. This phenomenon may be explained on the basis of regional considerations (long lasting tradition of production), or functional ones (weight). However, one should not overlook the factor of preservation, which seemingly has contributed to this distinct bias, as iron object appears to be more prone to the ill effect of corrosion.

The dominant group of scales (**PL. V.11: 2A**) belongs to Type 14 (Vol. I, p. 44). They were secured to each other by mean of copper-alloy wires and sewn to a foundation by some sort of organic threads, which are now lost.

An additional structural element was briefly noted in Macalister and Bliss' account. The scales, they write, 'are slightly bent vertically, so as to be concave to the body' (Bliss and Macalister 1902, 150). This phenomenon is well documented in the Roman west (Robinson 1975, 154, Pls. 436, 439, 441). Seemingly an intentional product, this structure presumably

enhanced the strength of the scales. In addition, enlarging the surface of cuirass, the bumpy – turtle-like face – would have aided to divert arrowheads on impact.
Additional observation was noted by Bliss and Macalister:

> 'In two fragments the edges have been turned over so as to prevent them from cutting. These, in all probability, are portions of the collar' (*ibid.*).

Though the latter notion is plausible, an alternative and somewhat more simple explanation may be provided. Recently, Alex Croom presented a damage pattern visible on modern suits of *loricae squmata* that equipped the re-enactment group *cohors V Gallorum*.[93] It appears that the bending of the scales' tips and edges were the result of the constant contact with the suspending equipment (such as the sword's handle) (**PL. V.11: 3**).

As aforesaid, the rusty lump of scales contained additional type of scales that was clearly used concurrently (**PL. V.11: 2B**). Bliss and Macalister described it as follows:

> 'A few scales of different shape from the rest – rectangular below and invecked at the top – were also found; most probably these are part of the tasses of the lower hem' (Bliss and Macalister 1902, 150).

To the best of my knowledge no parallels are documented to this type of scales. Their identification as part of the cuirass' *pteruges* or sleeves seems to suggest that they were either sheathed inside the leather upper *pteruges* or fastened to their front face as metal applications.

[93] *Pers. comm.* The results were presented in a lecture at the ROMEC XII, Newcastle-upon-Tyne (1999).

V.12 – Horvat Midras (complex 31)

Map ref.: 1440 1182

Other names: Drusias; Kh. Drousia

PL. V.12

Reference: *TIRIP*, 114

History and geography

The boundaries of the site occupies 120 dunams, although adding the cemeteries that embrace the site from the west and south it appears to cover an area of some 250 dunams (Kloner 1987a, 137-145, Pl. 1, Fig. 160) (**PL. V.12: 1**). During the surveys conducted at the site 71 caves were marked, of which 10 hiding complexes were identified. Among the complexes, one Complex 31 is situated in the north west sector of the site (*ibid.*, 143-145). It comprises of ancient installations (like a Hellenistic cistern) that were connected by tunnels. Generally speaking, the complex is composed of two wings that are connected by a long tunnel that features a stone door.

Militaria

A single silver pendant that is associated with Roman military origin was uncovered in hiding complex 31.

Catalogue

T. Cult utensils

1. Silver pendant

PL. V.12: 2-3

Site:.....Horvat Midras
Survey:.....Kloner (1981)
Provenance:...Hiding complex (No. 31)
Material:.....Silver
Dimensions –
Length:.....65mm
Width:.....50mm
Thickness:...6-10mm

Published as pendant that depicts a women face with flanked by dreadlocks (Kloner 1987b, 355, Pl. 1: 21, Figs. 161, 168). Kloner notes that the face organs were intentionally filed as an act of iconoclasm, like the observed features on the ceremonial vessels found at the Cave of Letters (V.24). Nevertheless, the hairstyle appears to be more elaborate than described above and comprise of some kind of headdress, as well.

V.13 – Wadi Suweinit, Cave el-Jay

Map ref.: 1750 1410

Other names: Nahal Mikhmash

PL. V.13-V.13A

Reference: *TIRIP*, 60

Geography and history

The cave is situated in a dry waterfall at Wadi Suweinit (el 'Aleiliyat), which is the northern stream of Wadi Qelt, some 9km north-north-east of Jerusalem. The Karstic cave has two entrances from which stems a series of corridors and halls (**PL. V.13: 1-2**). The cave suffered from extensive illicit excavations. A metal detector survey and excavation that took place near the secondary entrance and most inner large hall (Hall 8) in 1998 revealed numismatic, pottery and glass evidences for the occupation of the cave during the Second Revolt (Eshel, Zissu and Frumkin 1998, 94-103).

Militaria

In addition to a hobnail and a unique barbed iron spearhead that were found in Hall 8, an iron *catapult* bolt was unearthed in the mouth of the cave (*cf.* V.20/M.1).

Catalogue

D. Military dress and footwear

Caliga hobnials

1. *Caliga* hobnail **PL. V.13: 3**

Site:.....el-Jay Cave
Provenance:.....Hall 8
Expedition:.....Eshel 1998
Excavation no.:...Unknown
Material:.....Iron
Dimensions –
Length of shank:.....5mm
Diameter of head:...10mm

A single iron *caliga* nail with a spherical head, was found in the deepest hall of the cave (Hall 8) (Eshel, Zissu and Frumkin 1998, 98, Pl. 2: No. 4). The lower half of the shank is now missing. Parallels in Palestine: Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-3), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1) and Kfar el-Maker (Shaked 1996, 26).

H. Shafted weapons

Spearheads

1. Iron spearhead **PL. V.13A: 1-3**

Site:.....el-Jay Cave
Provenance:.....Inner hall of the cave (hall 8)
Expedition:.....Eshel 1998
Excavation no.:...Unknown
Material:.....Iron
Dimensions –
Total length:.....76mm
Length of head:.....61mm
Width of head:.....24mm+
Thickness of head:...8mm
Diameter of bulb:.....11mm
Thickness of bulb:....12mm
Length of tang:.....23mm
Width of tang:.....4-8mm
Thickness of tang:....6mm
Weight:.....18.24gr

The elongated iron tanged head has an oval section and prominent outturned barbs. Both faces exhibit a protruding bulbous-like feature just above the tang. The form of the head bears striking resemblance to a typical copper-alloy Hellenistic arrowhead. Yet, this is the to the best of my knowledge the first iron example of the type, and being far too heavy to be an arrowhead was in all likelihood a spearhead. I know no artefactual parallels to this head. Furthermore, as the cave was not found to retain culture material from the Hellenistic period it may be dated to the time of the Second Revolt. If indeed the date is correct, this object exemplified the lastingness of designs, otherwise this may be a reused head, a phenomenon that is not unknown in this revolt. Nonetheless, a stone relief from the early years of the 1st century BC may indeed provide us with an evidence for the Roman use of such heads (**PL. V.13A: 2-3**). The relief depicts a group of Roman warriors upon a galley. The soldiers are equipped with oblong *scuta* and wear Montefortino helmets. They carry spears the head of which is very similar in shape to the spearhead under discussion. Exhibiting a mid-rib the heads have distinctive outturned barbs. Sekunda referred to these shafted weapons as follows: 'The peculiar shape of the spearheads may be distinctive of the '*hasta navalis*' (Sekunda 1996, 14 (below)). However, in light of the evident typological resemblance to the Hellenistic copper-alloy arrowheads I believe the Romans may have in fact adopted this design from the Hellenistic arsenal and adapted it as a spearhead.[94] As asserted above the head from el-Jay cave may either serve as bridging evidence indicating the lastingness of designs or merely an heirloom.

M. Torsion artillery

Catapult bolts

[94] For the Roman adoption of the Spanish sword which was thereafter adopted by the Seleucid and Ptolemaic armies, see: Stiebel 2004a.

1. Socketed iron bolt **PL. V.13A: 4**

Site:.....el-Jay Cave
Provenance:.....Cave's mouth
Expedition:.....Eshel 1998
Excavation no.:...Unknown
Material:.....Iron
Dimensions –
Total length:.....58mm
Length of head:.....26mm
Width of head:.....12mm
Length of socket:.....32mm
Width of socket:.....15x14mm
Thickness of socket:.....3mm
Length of slit in socket:...27mm
Weight:.....22.24gr

Slightly corroded iron bodkin bolt. The head is produced in a rather sloppy manner, with rough square section outlines. It has the typical split socket, square in section, that is apt to accommodate the quarrel wooden shaft (for wooden quarrel shafts: James 1990, 95-98). Many parallels are known throughout the Empire. In the East socketed bodkins are reported from Gamala and Jotapata of the First Revolt and the head of the improvised javelin from the Figs Cave (V.21/H.1) of the Second Revolt; 3rd century AD Dura-Europos (*ibid.*, 265-274, nos. 2.7.1-37). Yet, exact parallels for the square-sectioned socket are not so frequent – Vindonissa (CH) (Unz and Deschler-Erb 1997, 26, no. 518), Dangstetten (DE) (Fingerlin 1986, 103 FS 288, 1 and 318).

V.14 – Cave of the Sandal and the terrace of the Cave of the Sandal

Map ref.: 19106 14203

Other names: Caves VIII/28 and VIII/27 (respectively)[95] **PL. V.14-V.14A**

References: *NAEHL* III, 837

Geography and history

The Karstic cave is situated some 300m south of the large caves complex in Ketef Jericho (**PL. V.14: 1**: Eshel and Zissu 1998). It developed along a crack between two limestone layers of the Shivta formation. The small mouth of the cave is located 8m above a terrace in the southern cliff of Wadi el-Mafjar (**PL. V.14: 2-4**). Excavated in 1993, the cave retains a layer from the Chalcolithic and Early Bronze periods in addition to a Roman layer. In the latter, a relatively rich assemblage of finds was discovered, including three hoards of coins (26 coins), metal needle, wooden comb, leather sandals, glassware, ropes, threads, fragmented textiles and basketry utensils as well as rings and earrings (*ibid.*, 119-120, 125-127, 128-136, 136-138, 139-140, 141-142, 143). Bones of ten individuals were discovered in the cave. The excavators noted that the cave was not disturbed and appears to reflect the possessions that was brought to cave at the end of the Second Revolt (*ibid.*, 144). The study of the botanical remains indicated that rebels found shelter in the cave in the autumn (September-October), possibly of the AD134 or 135 (Kislev and Hartman 1998 and Eshel and Zissu 1998a, 145).

Militaria

Two arrowheads, a *caliga* nail a fragment of a shield board and a leather scabbard were uncovered during the excavations of the cave. These finds were in all likelihood in the possession of the rebels, whose bones were found in an undisturbed context, presumably belonging to any of the three males that were identified among the ten individuals (*ibid.*, 122). According to the excavators, these fugitives were killed by suffocation, caused by a smoke that rose from a fire ignited by the Roman soldiers in the mouth of the cave (*ibid.*, 145). This method spared the chasing Roman soldiers the difficult accessing to the cave that requires strenuous crawling. The trilobate arrowhead was found in a small terrace below the caves mouth (VIII/27), which may have been used as an observation point, similar context was noted in the Cave of Letters (V.23).

[95] Survey 1993 – Caves 3 and 8 (respectively).

Catalogue

D. Military dress and footwear

1. *Caliga* hobnail **PL. V.14A: 1**
Site:.....Sandal Cave
Expedition:.....Eshel and Zissu 1993
Provenance:.....Area C (Sieving)
Excavation no.:...L. 32-34; B. 1148
Material:.....Iron
Dimensions –
Diameter of head:.....13mm
Thickness of head:.....1mm
Thickness of shank:...2-3mm

The iron hobnail was found together with two leather fragments. It has a relatively flat dome head, badly chipped and the shank is broken it bending point.

E. Shields

1. Fragment of shield board **PL. V.14A: 5**
Site:.....Sandal Cave
Expedition:.....Eshel and Zissu 1993
Provenance:.....Area C
Excavation no.:...L. 21; B. 909
Material:.....Leather, wood, painted gesso
Dimensions –
129x95mm

A small fragment of a scutum board was found in the cave. It exhibits the sandwich-like construction, of two outer leather layers that sheathed wooden layer, so popular at the Masada assemblage.

The interesting aspect is the scant remains of the gesso found upon the leather facing. In addition to white gesso, the colours of red and black are also discernable (Vol. I., pp. 91ff, 361ff). It is to date the sole example of this decoration technique in Palestine. The earliest example was uncovered in the 2nd century BC context at Ai Khanoum (AF) (Bernard 1973), while exceptional examples are reported from 3rd century AD Dura-Europos (James 1990, 68).

F. Edged arms

Leather sheaths

1. Leather sheath **PL. V.14A: 2**
Site:.....Sandal cave
Expedition:.....Eshel and Zissu 1993
Excavation no.:...Area C; L. 20(26?); B. 953
Material:.....Leather
Dimensions –

Length:.....120mm
Maximum width:...12mm
Thickness:.....2mm
Width of mouth:....18-20mm

A decorated leather sheath (*vagina*) (Vol. I., pp. 117-119). The object's dimensions indicate it sheathed a small bladed utensil, presumably a long and narrow backed tapering knife. The faces of the object are rather damaged most of their epidermis is now missing. The front of the sheath is decorated by a pair of horizontal lines from which stem a perpendicular pair of lines that runs along the object's perimeter. The horizontal lines of the initial pair are 2.5mm apart and decorate both front and back faces. The lines of the second pair are 2mm apart and run along the edge towards the sheath's tapering end.

Knife *vaginae* were unearthed in Vindolanda (UK) (van Driel-Murray 1993, 49, fig. 21, Nos. 4-6). One of the sheaths is decorated with lightly impressed lines (No. 6). In Israel, a crude leather knife's sheath was found in the Cave of Letters at Nahal Hever (V.23/F.1) and an additional example is reported from Cave 38 at Nahal Se'elim (V.30/F.1).

I. Archery

Iron arrowheads

1. Iron trilobate tanged arrowhead **PL. V.14A: 3**
Site:.....Sandal cave
Expedition:.....Eshel and Zissu (1993)
Excavation number:...No. 152
Material:.....Iron
Dimensions –
Length:.....45.5mm
Length of tang:...14.5mm
Width:.....5mm

The partly damaged trilobate head was discovered in a small porch below and slightly north of the cave, where guards could observe and control the ascenders (Eshel and Zissu 1998, 139). It exhibits round vanes (type D). Similar heads were found in both First and Second Revolt contexts: Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91) and Kh. Qumran (de Vaux 1973, 36). Refuge caves of the Judaean Desert – the Cave of Letters (V.24/I; Yadin 1963a, 91, Nos. 38-40 (II.9-10 and I.5), Fig. 32, Pl. 25) in Nahal Hever, the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b) and at the Cave of the Pool in Nahal David (V.20/I; Avigad 1962, 183, Pl. 18c). It was also uncovered in the Murabba'ât caves (V.16/I.3-5; de Vaux 1961, 37, Fig. 9: 6-8), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

2. Iron bodkin tanged arrowhead **PL. V.14A: 4**
Site:.....Sandal cave
Expedition:.....Eshel and Zissu (1993)
Excavation number:...No. 174
Material:.....Iron
Dimensions –
Length:.....57mm
Length of tang:...19.5mm
Head:.....6.8x5.9mm

Well-preserved tanged bodkin arrowhead. Such heads are attested in the First Revolt: Meroth (III.1/I.1), Gamala, Magdala (III.4/I.1), The Site of the Caves (III.5/I.1-35), as well as in the Second Revolt: 'Ein Feshkha (V.5/I.1), the Spear Caves (V.20/I.1). See also the ROM collections (VI.5/I.1).

V.15 - The Large Caves Complex and the Avi'or Cave

Map ref.: 19094 14208

Other names: Caves VIII/9 and VIII/10 (Spies' Cave) (respectively)[96] **PL. V.15-V.15A**

Geography and history

This complex of caves is situated in the southern bank of Wadi el- Mafjer, in the middle part of the cliff that raises above the oasis of Jericho, about 1km west of the spring (**PL. V.15: 1-3**). Simon son of Matthias erected a Hasmonean fortress, named Doq, at the head of the cliff. During the Second Revolt the caves were used by the rebels as attested by the epigraphic, numismatic, glass and pottery finds, as well as culture material such as wooden comb (Eshel and Zissu 1998; Eshel and Zissu 2002b). The caves were inhabited by Byzantine monks commencing in 4th century AD (340) onward, the monastery of the Quarantal (Laura of Doq) that is situated above a cluster of ancient cave is still active today. The caves under discussion retained archaeological evidences for human activity in the Chalcolithic, Early Bronze, Hellenistic, Roman and Byzantine periods. Yet, the most significant phase was that of the Second Revolt.

Later human activity, ranging up to 1967, was identified by the excavators. The latter included among others a hoard of three Canadian rifles that were used by Jordanian army and were presumably hidden in the cave following the Six Days War.

Militaria

In addition to the *caliga* hobnails and a fragment of a nailed sole form the Avi'or Cave, a javelin head typical of the Second Revolt, was found at the foot of the cave's mouth, in Area I of the Large Caves Complex. The latter was erroneously published as a medieval arrowhead (see below).

Catalogue

D. Military dress and footwear

1. *Caliga* hobnails **PL. V.15A: 1**

Fragmentary remains of a *caligae* soles (Eshel 1988; Eshel and Zissu 1998, 142-143, Fig. 27). In addition of the studded heel of the sole, with four attached hobnails, and a leather knot, fourteen nails were found.

H. Shafted weapons

Javelins

[96] Survey 1993 – Caves 2 and 1 (respectively).

1. Light javelin head **PL. V.15A: 2**
Site:.....The Large Caves Complex
Provenance:...Terrace of the cave
Expedition:....Eshel and Zissu (1993)
Material:.....Iron
Dimensions –
Length:.....98mm
Length of blade:...87mm
Width:.....14mm
Length of collar:...5mm
Length of tang:.....6mm
Thickness:.....2-4mm

An elongated leaf shaped iron head. The low-shouldered head has a short collared tang. The tip of the blade is missing and its perimeter suffered from corrosion. The head was mistakenly identified as a 'medieval arrowhead (Eshel and Zissu 2002b, Part 1, 157, Fig. 12 (Hebrew) and Part 2, 125). However, its size and shape clearly designate the head as a Javelin head – Type VII. The latter is typical of the Second Revolt and parallels are known from refuge caves in the Judaean Desert: Wadi Murabba'ât Caves (V.16/H.4), Cave FQ37 (III.18/H.1) and the Tetradrachm Cave (V.25/H.1).

V.16 – Wadi Murabba'ât, Caves 1-2

Map ref.: 1858 1105

Other names: Wadi Daraje; Nahal Dargah/Dragot

PL. V.16-V.16A

Reference: *TIRIP*, 189; *NEAEHL* III, 833-835

Geography and history

The Wadi Murabba'ât Caves were the first Judaean Desert caves to be excavated (January-February 1952), following the robbery excavations of the local Bedouins (late 1951). During the excavations the legendary character of the Second Revolt leader – Shimeon Ben Kosiba (Bar-Kokhba) – has emerged for the first time from the letters there unearthed. Four caves, located in the north cliff of Wadi Murabba'ât, were excavated, though most of the *militaria* finds were confined to Caves 1-2 (**PL. V.16: 1**).[97] The ambiguity that surrounds the exact origin of some of the objects is a result of them being acquired by the excavators at the antiquities market prior to the commencement of the archaeological excavations.

Most interestingly, the epigraphic evidence from the caves retained documents of Roman soldiers (P. Mur. 114, 117). The documents, that had been dated respectively to AD141 or AD171 and the ninth decade of the 2nd century AD, were claimed to reflect Roman military presence in the caves. Furthermore, they were taken to indicate that Roman soldiers inhabited the caves in order to prevent the return Jewish refugees (*DJD* II, 240-243, 256-258; *NEAEHL* III, 833-835; Eshel and Amit 1998, 17-18). However, I find it highly improbable that a Roman contingent would have settled in a dark cave (like Caves 1 and 2) that is over 40m deep, located on a sheer cliff, just to keep away possible appearance of refugees, following their comrades' elimination. It contrasts the manner the army has preformed in the nearby canyon of Nahal Hever – were two temporary camps were identified above the caves – as well as in the hiding complexes in the Shphelah. It seems that different explanation for the existence of these documents in the caves should be sought out. Whether they were taken with the booty of the fleeing rebels, or otherwise had been left behind the by the attacking soldiers (*cf.* P. Mas. 722). In any event there is little logic behind the assumption that a Roman unit spent a prolonged period of time in the caves. Indeed, Prof. Hannah Cotton has recently informed me that a revised reading of these documents indicated that they in fact date from the time of the Second Revolt (Cotton and Eck 2002).

Militaria

A diverse collection of equipment was uncovered in the Caves, including the largest and most varied collection of shafted arms uncovered in Roman Palestine. The archery equipment is represented by four arrowheads, three trilobate heads and one rare flat leaf head. In

[97] A fifth cave (1.2x0.8m), that is located in the South cliff some 300 hundreds meter upstream, was cleared in 1955 (de Vaux 1961, 50).

addition, we may note four fragmentary arrows' footings and two biconical worked stone slingshots. A rare wooden military bread stamp was part of the collection (de Vaux 1960, 37, Fig. 12.9, Pl. IX, No. 26), *contra* de Vaux's reading: >ANNAEI GARGILIU, I offer the reading: >AMAEI GARGILIU. For Amaeus, see Fink 1971, **3**a 4 (Amaeus); **1** xxxviii 17 (Aurel Amaeus ladibeli); **1** xli 14 (Aurel Amaeus Za[bdibo]li); **6** iii 32; **1** viii 16; **2** xiii 28 (Amaeus Zebida). About military bread stamps in Palestine *cf.* Stiebel 1999, 72-74.

Catalogue

D. Footwear and clothing

The excavators identified several leather items as military dress (*DJD* II, 10-14, Pl. IX: 22-25, Fig. 11: 1-4, 6)[98], although this assertion appears to have no legs. Hence, No. 25 is part of a sandal that is not necessarily military in nature.

F. Edged weapons

Scabbards

1. Scabbard (?) **PL. V.16: 8**
Site:.....Murabba'ât
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Dimensions –
Length:...64mm
Width:....60mm

A possible leather scabbard was reported from the caves (de Vaux 1961, 35, Pl. IX: 15). The overlapping edges of the tapering object are sewn together.

Parallels: Masada (III.19/F.18).

H. Shafted weapons

Pila

1. *Pilum* head **PL. V.16: 2-3**
Site:.....Murabba'ât, Cave 2
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 153
Material:.....Iron
Dimensions –
Length:.....172mm+
Length of head:.....75mm
Length of tang:.....97mm+
Thickness of head:.....12x9mm
Thickness of shank:...7x7mm

[98] See Yadin 1963a, 164.

A slightly pyramidal square-sectioned head surmounts a long narrow shank (de Vaux 1961, 35, Fig. 9: 2; Pl. IX: 1). The end of the square-sectioned shank appears to be broken. In Palestine, a single head is recorded in a Hellenistic context at Samaria (I.6/H.1). This site yielded a further head, dated to the Roman period (I.6/H.2). Additional head was found at Qumran (III.17/H.1) while an unidentified head is reported from Yoqne'am (II.2/H.1). A socketed *pilum* head from the Second Revolt is attested at Bethther (V.6/H.1).

Iron spearheads and javelins

2. Iron spearhead **PL. V.16: 4-5**

Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 168
Material:.....Iron + wood
Dimensions –
Length:.....166mm
Length of head:.....80mm
Width of head:.....16mm
Thickness of head:....1-4mm
Diameter of socket:...10mm

A unique socketed spearhead with thin and elongated blade (de Vaux 1961, 35, Fig. 9:5; Pl. IX). The edges of the blade are consistently notched. Such toothed edges would have caused the victim an intensified haemorrhage (Vol. I, p. 134). Upon discovery the socket still retained the remains of the wooden shaft.

3. Iron javelin **PL. V.16: 6-7**

Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 169
Material:.....Iron
Dimensions –
Length:.....124mm+
Length of blade:.....72mm
Length of collar:.....3mm
Length of tang:.....49mm+ (bent)
Width:.....15mm
Thickness of blade:...3mm
Thickness of collar:...8mm

Complete, ribbed javelin head (de Vaux 1961, 35, Fig. 9: 3, Pl. IX: 2). Bent tang. The collared blade is facetted and exhibits a rounded distal end. A very close parallel was uncovered in Qumran (III.17/H.2). Examples with rounded tips, though socketed and lacking a midrib, were reported from Vindonissa (CH) (Unz and Deschler-Erb 1997, No. 280, 282, Taf. 18).

4. Light throwing javelin head **PL. V.16A: 3-4**

Site:.....Murabba'ât, Cave 2

Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 162
Material:.....Iron
Dimensions –
Length:.....90mm
Length of blade:.....66mm
Length of collar:.....8mm
Length of tang:.....16mm
Width:.....12mm
Thickness of collar:...4mm

Collared light-throwing javelin head (de Vaux 1961, Pl. IX: 8) – typical of the Second Revolt. The tang is slightly bent.

Parallels: The Large Caves Complex (V.15/H.1); Cave FQ37 (III.18/H.1) and the Tetradrachm Cave (V.24/H.1). A fragment was further found at the Site of 'Bypass Shoham' (V.10/H.1).

5. Javelin head **PL. V.16A: 1-2**
Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 161
Material:.....Iron
Dimensions –
Length:.....92mm
Length of blade:.....40mm
Length of collar:.....5mm
Length of tang:.....47mm
Width:.....25mm
Thickness of blade:...3mm
Thickness of collar:...9mm

Iron collared tanged head. The broad blade is facetted. The uniquely broad javelin head was offered to be a *catapult* head (de Vaux 1961, 35, Fig. 9: 1, Pl. IX:5). However, no evidence is known to support this assertion. Instead, in light of a reference in Josephus's account I offer to identify it as a javelin head that was used by horsemen. Narrating the equipment of the Roman cavalery Josephus notes a quiver that slung down the horse's side, in which 'three or more darts... having broad points, and not smaller than spears' (*BJ* 3.96).

6. Javelin head (?) (not illustrated)
Site:.....Murabba'ât, Cave 1
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 165
Material:.....Iron
Dimensions –
Length:.....87mm+
Width:.....10mm
Thickness:...4mm

The iron object comprises a long square-sectioned tang and a broken flat surface. De Vaux identified it as a spatula (de Vaux 1961, 43, Fig. 9: 10, Pl. XIV: 10). However, as little were spatulas produced from iron and taking into account the outlines of the object may suggest it is in fact the tang and the proximal part of a javelin head.

I. Archery equipment

Bow

1. Grip lath **PL. V.16A: 10-11**

Site:.....Murabba'ât, Cave 2
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 344
Material:.....Bone
Dimensions –
Length:.....97mm
Width:.....12mm
Thickness:...5mm

Simple noted as: 'Os. Lame orrondie aux deux extrémités' (de Vaux 1961, Fig. 12: 10, Pl. XII: 2). The bone object is a grip lath that formed part of the complexly structured core of a composite bow (Bishop 1985, 250).

Parallels: *ibid.*, 224-234.

Arrowshafts

2. Four fragmentary arrowshafts **PL. V.16A: 9**

Four arrow shafts were found during the excavations (de Vaux 1961, 35, Pl. IX; 18-21). The specific points of discovery were not mentioned. Three of the four fragments are wooden foreshafts (*ibid.* 18-20), while the last is a reed stele with a sinew whipping (*ibid.*, 21).

Parallels – Stiebel 2004b, 121-127, with references.

Iron Arrowheads

3. Iron trilobate arrowhead **PL. V.16A: 5B; 6B**

Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 170
Material:.....Iron
Dimensions –
Length:.....40mm
Length of tang:.....12mm
Width:.....10mm
Thickness of tang:...3mm

Trilobate arrowhead (de Vaux 1961, 35, Fig. 9: 6, Pl. IX: 4), that belongs to sub-type B. Tang is slightly bent.

Parallels: Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91) and Kh. Qumran (de Vaux 1973, 36). Refuge caves of the Judaean Desert – the Cave of Letters (V.24/I.1-3) in Nahal Hever, the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b), the Cave of the Pool in Nahal David (V.20/I; Avigad 1962, 183, Pl. 18c), Har-Yishai Cave (Stiebel 2004b), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

4. Iron trilobate arrowhead **PL. V.16A: 5A; 6A**
Site:.....Murabba'ât, Cave 1
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 162
Material:.....Iron
Dimensions –
Length:.....49mm (reconstructed)
Length of tang:.....20mm
Width:.....14mm
Thickness of tang:...3mm

Iron tanged trilobate arrowhead (de Vaux 1961, 35, Fig. 9: 7, Pl. IX: 3), which belongs to sub-type C. The tip of the head is slightly bent as its tang.

5. Iron trilobate arrowhead **PL. V.16A: 5C; 6C**
Site:.....Murabba'ât, Cave 2
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:...Mur. 171
Material:.....Iron
Dimensions –
Length:.....47mm
Length of tang:.....17mm
Width:.....10mm
Thickness of tang:...3mm

Iron tanged trilobate arrowhead (*ibid.*, 35, Fig. 9: 8, Pl. IX: 6). Tang is slightly bent. The cut tips of the vanes assigned it to sub-type F.

Parallels – Cave of the Arrows (V.28/I.1).

Flat iron arrowhead

6. Flat iron arrowhead **PL. V.16A: 7-8**
Site:.....Murabba'ât, Cave 1
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Excavation No.:....Mur. 164
Material:.....Iron
Dimensions –
Length:.....50mm
Length of tang:.....14mm

Width of head:.....9mm
Thickness of tang:...4mm

Flat leaf iron arrowhead (*ibid.*, 35, Fig. 9: 9, Pl. IX: 7). The blade is slightly damaged.

K. Sling

Stone slingshots

Two slingshots, made of limestone (calcite), were published (de Vaux 1961, Pl. IX: 16-17).

No information was given, as for the exact location of find.

1. Worked stone slingshot **PL. V.16A: 12A**
Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Material:.....Limestone
Dimensions –
42x27mm

Parallels: ROM (CA) (VI.5/K.1).

2. Worked stone slingshot **PL. V.16A: 12B**
Site:.....Murabba'ât, Cave 2 (?)
Expedition:.....Benoit, Milik and de Vaux
Provenance:.....Refuge cave, inner hall
Material:.....Limestone
Dimensions –
54x28mm

Identical to the previous object.

V.17 – Wadi el-Mrarzah, The Spear Caves (Cave 84)

Map ref.: 18653 10495

Other name: Ras el-Manqushiyah **PL. V.17-V.17A**

Geography

A cluster of five caves was surveyed in 2001 at Wadi el-Mrarzah in the Judaean Desert, by a team from Bar-Ilan University under the directory of Prof. Hanan Eshel (Porat and Eshel 2002).

The caves are situated east of the plateau named Ras el-Manqushiyah, some 100m north of a 300m high dry waterfall of Wadi el-Mrarzah (**PL. V.17: 1-2**). A large water pond[99] is located above the waterfall, and an additional one is situated about 300m upstream. The caves' cluster was formed in Shivta formation around a rock step 40m long and 11m wide. It retains two relatively large caves exceeding the length of 35m (84a-b) and three more small caves that are situated one above the other. The caves suffered from robbery activity.

History

The finds from the caves included typical pottery sherds from the end of the Second Revolt (*ibid.*, 95-96, Pl. 1, table 1),[100] and one bronze coin of the third year (AD134) (*ibid.*, 97). We may also note an additional bronze coin of the third year, along with a copper-alloy key ring and a weaving implement (Eshel, *pers. comm.*). The numismatic evidence supports a deposition date of the late stages of the revolt (*cf.* V.19; Porat and Eshel 2002, 97-98), possibly between September-October AD135 and January AD136 (Kislev and Hartman 1998; Eck 1999).

Militaria

Two iron arrowheads and one iron spearhead were uncovered in Cave 84 (Porat and Eshel 2002[101]; Porat, Eshel and Stiebel 2002; Stiebel 2004b, 127-128).

Catalogue

H. Shafted arms

Spears

1. Iron spearhead **PL. V.17A: 1-2**

Site:.....Wadi el-Mrarzah, The Spear Caves (Cave 84)

[99] *Gev* (– (גבא pond of standing water in hollow of rock.

[100] One sherd of Hellenistic jar was gathered in the cave as well (Eshel, *pers. comm.*)

[101] This article covers only part of the work carried out in the caves. The finds that were uncovered following the publication included a coin and a flat tanged iron head. The information is based upon personal communication with Hanan Eshel.

Provenance:...Refuge cave (Cave 84b)
Expedition:....Eshel 2001
Material:.....Iron
Dimensions –
Over all length:.....360mm+
Length of blade:.....270mm
Maximum width of blade:...36mm
Thickness of blade:.....6mm
Tip:.....6x7mm
Length of tang:.....86mm+
Diameter of tang:.....10mm
Tang (square section):.....6x7mm
Weight:.....246.2gr

The spear, which denoted the caves their name, has an elongated narrow blade which stems from a long circular sectioned shank. It was found in an unprecedented condition of preservation, suffering no corrosion, still retaining the original shiny complexion. One of the blade's edges suffered a minor localized damage. The base of the blade tapers to a rhomboid section shank, which develops into a circular section. The latter part is decorated by geometric design. A winding incised lines pattern is bordered by a ring at bottom and by a pair of rings at its top. The long narrow shank implies that the spear belonged to a *pilum*-like category.

To the best of my knowledge no parallel is known to the spearhead. As the remains in the caves dates to either the Chalcolithic or the Roman periods, the spearhead, no doubt, belongs to the latter. The lack of similar example in the West may be accounting for its Eastern origin. The fact the spear has no parallel in the Roman arsenal, both in the East and West, indicate it was most probably a local weapon. The only shafted weapon whose outline bears general resemblance is an iron spearhead from the Murabba'ât cave (V.16/H.2). This notion is of particular interest, for the construction of a weapon often reflects the fighting technique, and in this case that of the Jewish warrior.

The traits of the head indicate it was intended for stabbing rather than hurling. The impact of this weapon was dangerous for the double-edged sharp and narrow blade, the tip of which was shaped in the form of a square-sectioned point, granted it an enhanced penetration capability. The length of the spear, and particularly the long shank, allowed the warrior to stab its opponent from a distance, away from the danger of the foe's sword. The fighting technique of the Roman legionary involved first the hurling of the pair of *pila*, the first of which from a distance of *c.* 30m and the second seemingly from some 16m from the target (Goldsworthy 1996, 197-206). Thereafter, the soldier collided with the foe in face to face battle, using his short *gladius* (*ibid.*, 216). The long spear appears to be designed for the intermediate zone between the hurling of the second *pilum* and the encounter with legionary and his drawn sword. Protecting oneself with the shield allowed the Jewish warrior to pass the raining *pila* and encounter the Roman soldier from the distance of 15-10m. At this point he

was in fact the first who could have employed his weapon for it was longer than the sword. The advantage of the Roman soldier was his superior protective equipment, which could have neutralized the effectiveness of such a spear. However, the thickening of the spear's tip enabled the penetration even of a mail (Stiebel 2004b, 127-128).

I. Archery

Iron Arrowheads

Bodkin iron arrowheads

1. Bodkin iron arrowhead **PL. V.17: 3**
Site:.....Wadi el-Mrarzah, The Spear Caves (Cave 84)
Expedition:.....Eshel 2001
Provenance:.....Entrance of cave (Cave 84a)
Material:.....Iron
Dimensions –
Length:.....58mm+
Length of blade:.....54mm
Blade:.....7x10mm
Diameter of tang:.....4mm
Weight:.....18gr

The bodkin arrowhead was found in the entrance of Cave 84a (Porat and Eshel 2002, 98, Fig. 6), a phenomenon that is attested in other Judaean Desert refuge caves. It has a rectangular cross-section. Interestingly, the tang does not stem from the centre of the head's base, possibly hinting a low level of craftsmanship – noting local production?

Parallels are known from Meroth (III.1/I.1, 4-6), Gamala (III.3/I), Magdala (III.4/I.1) and the Site of the Caves (III.5/I.1-35). From the Second Revolt contexts': the Sandal Cave (V.14/I.1) and the Spear Caves (V.17/I.1). See also the ROM collections (VI.5/I.1).

Flat barbed iron arrowheads

2. Flat barbed iron arrowhead **PL. V.17A: 3-4**
Site:.....Wadi el-Mrarzah, The Spear Caves (Cave 84)
Expedition:.....Eshel 2001
Provenance:...Refuge cave (soil from the illicit diggings)
Material:.....Iron
Dimensions –
Length:.....43mm+
Length of blade:.....30mm+
Length of tang:.....17mm
Width of blade:.....14mm
Thickness of blade:...1mm
Thickness of tang:.....1mm

A unique tanged flat-bladed and barbed head was uncovered some 150m below the caves in the heaps of the soils from the illicit diggings. The flat head has two rounded barbs. The collared tang is slightly bent, while the tip of the blade is missing, presumably due to impact.

This category is regarded as 'improvised' (Coulston 1985, 265-266), its simple structure and rareness in Palestine may strengthen this notion. The majority of the tanged flat-bladed arrowheads derives from Britannia, although most of which are later in date. The closest parallel may be drawn to the finds from Richborough (UK) (Bushe-Fox 1949, 153, Pl. LIX, 294, 302; Cunliffe 1968, 108, Pl. LIII, 264) and Vindolanda (Vindolanda IV, Fasc. 1, 19, No. 34, Fig. 7). Other examples were reported from Housesteads, Richborough, Bearsden (Manning 1985, 177; Coulston 1985, 265-266). Even though tempting, an association with the Britannic accompaniment forces of Julius Severus that had been transferred to Judaea to suppress the revolt seems far fetching.

V.18 – Madbach Sa'yid Abidah, The *Dinar* Cave (Cave 66)

Map ref.: 18737 10650

Other name: Ras el-Manqushiyah

PL. V.18

Geography

The small cave is situated in the conglomerate formation rather than the typically Karstic formation of Wadi Murabba'at, north of Wadi e-Duara (V.17), on the cliff east of Ras el-Manqushiyah plateau (**PL. V.18: 1**).[102] It was surveyed in 2001 by a team from Bar-Ilan University, headed by Prof. Hanan Eshel.

History

Two wooden handles of sickles, or knives/choppers, similar to those unearthed at the Cave of Letters (V.24), were uncovered in the cave. A silver Bar-Kochbaic *dinar* of the third year of the revolt was found in the survey, suggests the presence of rebels from the Second Revolt (Eshel, *pers. comm.*). This find, which is paralleled in the near by refuge caves (V.20), seemingly allow us to date the deposition of the below discussed equipment to the end of the revolt: September-October AD135 – January AD136 (Kislev and Hartman 1998; Eck 1999).

Militaria

A single iron javelin head was unearthed in the entrance to cave. It is a head of a light-throwing javelin, which is typical of the Second Revolt period. The head was found in an exquisite state of preservation and features an aerodynamic design. The faceted edges of both its faces would have generated a rotating motion that assured a smother and possibly more accurate flight.

Catalogue

H. Shafted weapons

Javelin heads

1. Light iron javelin head **PL. V.18: 2-3**
Site:.....Madbach Sa'yid Abidah, Cave 66
Expedition:.....Eshel 2001
Provenance:...Entrance of the refuge cave
Material:.....Iron
Dimensions –
Length:.....103mm
Length of blade:.....68mm
Length of tang:.....35mm

[102] The cave is about 1.25km north-east of the Spear caves (V.17).

Width of blade:.....20mm
Thickness of blade:.....1-2mm
Length of tang + bulbous:...34mm
Thickness of bulbous:.....6mm
Thickness of tang:.....1-2mm
Weight:.....12.43gr

The iron javelin head is slightly damaged along one of its edges (Port and Eshel 2003, 173, Figs. 6: 3 and 7: 3). Beside of few minute patches of corrosion it is in a very good state of preservation. It has a flat elongated blade that tapers sharply at its base to a bulbous element, from which exits the tang. The longitudinal faceted edges of the head (stepped section) granted the head with improved flying qualities. The alternate elevation forces provided a smooth rotating cruising of the weapon, a much desired trait. It is the best so far example of such aerodynamic design of a missile, two more heads fabricated in a like manner are known from the nearby Caves 1-2 at Wadi Murabba'at (V.16/H.3 and M.1). Two more facetted heads of unknown origin are found in the collections of the Institute of Archaeology, Hebrew University Jerusalem (VI.8/H.2-3). The head is a variation of the collared javelin head, which is commonly found in Second Revolt contexts: Site of 'Bypass Shoham' (V.10/H.1), The Large Caves Complex (V.15/H.1), Wadi Murabba'ât Caves (V.16/H.4), Cave FQ37 (III.18/H.1) and the Tetradrachm Cave (V.25/H.1).

V.19 – Nahal Qedem, The Figs Caves

Map ref.: 1866 1009

PL. V.19-V.19B

Geography and history

During a survey conducted in May 2002 at Nahal Qedem, which is situated in the eastern sector of the Judaean Desert (3km north of 'Ein Gedi), two adjacent caves were found (**PL. V.19: 1**).[103] Both were seemingly inhabited by Jewish rebels in the Second Revolt as attested by the numismatic and ceramic evidence (Porat, Eshel and Frumkin 2004).

In the northern cave, which suffered from modern robbery activity, the surveyors uncovered pottery from the time of the Second Revolt. In the adjacent southern cave, a coin of the city of Escalon, from the time Hadrian, was unearthed.[104] However, the major find in the latter was no doubt a shafted weapon in an unprecedented state of preservation (Stiebel 2004b, 117-119).

Militaria

The shafted weapon is composed of an iron *catapult* bolt head that crowns a short thin wooden shaft. This is to date the sole example from the Roman Empire of a complete shafted weapon, with its intact wooden shaft.

Catalogue

H. Shafted weapons

1. Hybrid javelin **PL. V.19A-V.19B**

Site:.....The Figs Caves (southern cave)
Expedition:.....Eshel 2002
Provenance:.....Refuge Cave
Excavation no.:...Unknown
Material:.....Iron and wood
Dimensions –
Overall length:.....1026mm
Length of head:.....200mm
Length of blade:.....90mm
Length of socket:.....110mm
Length of slit of socket:.....96mm
Diameter of socket (external):.....25mm
Thickness of socket:.....1mm
Diameter of fastening hole:.....3.5mm
Width of head:.....15x15mm
Length of shaft:.....882mm
Diameter of shaft (distal end):.....20.5mm
Diameter of shaft (centre):.....18mm
Diameter of shaft (proximal end):...18-19mm

[103] The survey team is headed by Prof. Hanan Eshel of Bar-Ilan University, to whom I am most grateful for granting me the permission to study the *militaria* from the site.
[104] Hanan Eshel, *pers. comm.*

Length of conical distal end:.....58mm
Overall weight:.....383.80gr
Weight of head:.....187.94gr
Weight of shaft:.....195.86gr

The shafted weapon was recently published – Stiebel 2004b, 117-119.[105] It was found concealed between collapsed rocks in the southern cave, the lower part of which was stuck in the dung layer that covered the cave's floor (**PL. V.19: 1**). The position of the shafted weapon near the cave's wall resembles that of the iron head uncovered in the basement of the priestly family Qatros in the Upper-City of Jerusalem (III.12/H.1).[106]

The weapon consists of a socketed bodkin iron head that crowns a wooden shaft and it lacks a ferrule (**PL. V.19A: 1**).[107] The head has a square-section and it is polygonal in cross-section at its base (**PL. V.19B: 1-2**). The latter smoothly evolves into a split socket. A hole for the fastening nail is spaced at the lower though no nail exists. Indeed, no signs for attachment by a nail are visible on the wooden distal end. Over 100 such socketed heads were uncovered at Gamala (Gutman 1994, 96-97) and 15 specimens at Jotapata (Aviam 2002, 128). In the East, some 37 socketed bolts were reported from Dura-Europos (SY) (James 1990, 94, 265-273). For Western examples, see: Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 459-546, Taf. 23-24, with ample references). The measurements of the head under discussion indicate it belongs to the large calibre *catapult* bolts.

Besides the shaping of its conical end and its rounded base, the wooden shaft bears no tool marks, suggesting it was cut in this condition from the tree. Coppicing was a necessary procedure in order to attain strong straight branches of an appropriate diameter (Bishop and Coulston 1993, 192). The lack of production signs indicates that the shaft was cut at the right age, which allowed enjoying the utmost natural strength and elasticity of the wood. It seems just assuming that the shaft originally weighed more than the present figure due to the water's content in the wood.

In light of the above it appears that the iron head was part of a Roman *catapult* bolt, which was either gathered by one of the rebels in a battlefield, or was shot at the rebels. It was than detached from its wooden quarrel shaft (Dura-Europos: James 1990, 95, 97-98, 280-288, Pls. 2.7.M-AD; Qasr Ibrim (EG): James and Taylor 1994) and was set at the head of the thin wooden pole. The evident imbalanced construction indicates that this javelin was intended to function as a thrusting rather than a missile weapon. In light of its small proportions the arm was characterized as a javelin although it has presumably functioned as a spear. This weapon

[105] For the context: Porat, Eshel and Frumkin 2004, 84, 89.
[106] For the act of leaning shafted weapons against the wall, see: Homer *Il.* 13.260-261.
[107] The socket of a spearhead from Wadi Murabba'ât still retained remains of the wooden shaft (V.16/H.2; de Vaux 1961, Mur. 168).

is a very rare example of field modification, which seemingly reflects the dire shortage of weapons' supply the rebels suffered from towards the end of the revolt.

Nahal David (Wadi Sdeir)

Other names: Wadi Sdeir

Reference: *TIRIP*, 191; *NEAEHL* II, 832-833

The crick north to the ancient village of 'Ein Gedi is named Nahal David (in Arabic – Wadi Sder). The main cave in which material culture from the Second Revolt has been unearthed is the Cave of the Pool. Unlike most of the refuge caves of the Judaean Desert, for which the access is often extremely difficult and hazardous, ascending the Cave of the Pool is strenuous but not dangerous. Like most of these caves, it is a natural cave, the result of Karstic dissolving processes. The nearby springs provided the refugees with essential running water. It proximity to the site of 'Ein Gedi seemingly allows us to assume the origin of the fugitives in the village.

V.20 – The Cave of the Pool

Map ref.: 1851 0976

Geography and history

PL. V.20-V.20A

The 33m long cave is situated high up in the northern cliff of Nahal David. The access to the cave is not dangerous though its entrance is concealed and can be observed only from a very short distance upon ascend (**PL. V.20: 1-2**).[108]

The cave was firstly examined by Sandal in 1905, which reported of the existence of a plastered pool and a group of intact jars which contained liquid, aligned next to one the cave's walls.[109] In front of the jars, Sandal mentions the existence of a spread out mat rag (Sandal 1907, 79-84). In 1956, Aharoni conducted a short excavation, which yielded pottery sherds, basketry and cordage fragments and organic food remains (Aharoni 1958, 40-44; Aharoni and Rothenberg 1966, 109-112). Unfortunately, none of the artefacts reported by Sandal has been detected. Between 1960-1961, as part of the Judean Desert Caves survey, the cave was thoroughly excavated by Avigad, head of Expedition A (Avigad 1961, 8-10, Pls. 2:B, 3 and Avigad 1962, 169-181, Pls. 15-21). Other than the already reported plastered reservoir, which granted the cave its name, remains from the Chalcolithic period, the Iron Age and the Roman period were uncovered. The finds from the Roman period are assigned to the days of the Bar-Kokhba revolt, based upon the numismatic evidences, as well as the material culture. The pottery, glass, and basketry artefacts are similar to those found in other Judean Desert caves, all related to the Second Revolt. Three documents that were acquired from Bedouins in 1952 are believed to originate in the cave (Eshel 1998, 31-2).

[108] This assertion, made by Avigad and others, is relevant for whom who stands in the bed of Nahal David. The entrance could be observed from the adjacent cliffs, as indicated in the accompanying photos.

[109] For evidences of food storage in jars in the refuge caves *cf.* Eshel 1998b.

Avigad claimed the status of the refuges that settled the cave to be high, thus linking their origin to the relatively wealthy population of 'Ein Gedi. His conclusion is a derivative of the existence of the plastered pool in the cave. It seems to me a far-reaching conclusion to be based upon single evidence, which for it self is not conclusive as plastered water containers are documented in Nahal Harduf and Wadi Murabba'ât.

The relatively scant find in the cave brought Avigad to conclude that the Jewish refugees eventually safely fled the cave taking with them their valuable belongings. However, as is demonstrated below, the find of the military equipment (namely a *catapult* bolt stuck to the cave's ceiling) suggest the immediate presence of Roman soldiers, which may have looted the cave after its conquest.

The cave was re-surveyed in 14.05.2003, by Roi Porat (Bar-Ilan University).

Militaria

Though only few military fittings were unearthed in the Cave of the Pool, they are, nevertheless, of special interest. Most of the published *militaria* fall under the category of archery tackle, notably iron projectiles and several arrowshafts. Examination of the organic material, partly unstudied to date, revealed more wooden arrowshafts as well as a fragment of a shield's board of a rare type.

The robbery activities of the Bedouins denied the excavators the ability to associate the finds with its original deposition context. The only exception is an iron head found stuck to the ceiling of the cave's entrance. According to Avigad, the closing Roman soldiers shot it (Avigad 1961, 10). Since the entrance can only be seen from a close distance, the shot must have been taken from a very near position (see below).

Catalogue

E. Shields

Oval plank shield

1. Fragment of oval plank shield board **PL. V.20A: 1-2**

Site:.....The Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Excavation no.:...29/1 (noted on the box) – 87 נד
Material:.....Wood
Dimensions –
Length (damaged):.....88mm+
Width (damaged):.....36mm+
Thickness (max.):.....5mm
Thickness at edge:.....4mm
Distance of stitching holes from rim:...6.5-11mm
Distance between stitching holes:.....6-9mm

The box, which contained the object, is labelled 'pool' and 'Nahal David' in Hebrew. As for the box's content, the note merely reads 'part of a wooden vessel'. The artefact has an oblique worked edge, along which a series of six holes were pierced. The object is a fragment of an oval, plank shield board, a type known to date only from Dura-Europos (SY) (James 1990, 59-61, 62-65, 73-75, Pls. 2.4.AR; Vol. I, p. 82ff). The oval plank shield was the most common type at Dura-Europos. The planks of wood, which were identified as Poplar (*Populus euphratica*), are vertically oriented. The shaping of the edges of the planks was aimed to provide precise symmetry between the planks, which were glued lengthwise. The perforated perimeter was used for the attachment of leather binding or secured a leather cover that coated the shield's faces (James 1990, 63-64). Referring to leather binding: Southern and Dixon assert that 'rawhide may have replaced metal in this role because it was cheaper and easier to repair, probably enabling the soldier themselves to undertake any necessary maintenance' (Southern and Dixon 1996, 101).

To the best of my knowledge this is the first example of the type, outside Dura-Europos. Given its *terminus ante quem*, of AD135, the Cave of the Pool's fragment, is apparently the earliest appearance of the oval plank wood shield.

I. Archery

There are no complete arrows from the Cave of the Pool, although remnants of all its components are attested. During Avigad's excavations, one arrowhead and some five arrowshafts were reported. However, recent examination of the unstudied material revealed further arrowshafts. The survey of Porat unearthed additional two arrowheads.

Wooden arrowshafts

Five wooden shafts are included in the plates accompanying Avigad's preliminary report of the season of 1961 (Avigad 1962, Pl. 18: C).[110] The artefacts served as foreshafts of the arrows. Strangely, in his report, Avigad merely notes the discovery of only 'two broken arrow-shafts' (*ibid.*, 178). All the shafts, but one, are in a fragmentary state of preservation. The best preserved example exhibits a complete wooden foreshaft.

Three worked wooden arrow foreshafts were identified among the organic remains that were packed in a card-paper box handed over to the late Prof. Zaitchek, which have apparently never been fully studied.[111] They were found in Room I, which was not fully excavated, seemingly collected from its upper most layer (Avigad 1962, 170).

[110] The title of the plate reads: 'Arrows, shafts and heads'. Nevertheless, other than the five shafts and one iron trilobite head, an additional wooden object is presented. The latter certainly does not belong to the archery category.

[111] The title on the box reads: Expedition A, Room A, Organic remains in the ash layer, 13/3/61.

Iron arrowheads

Three tanged trilobite iron arrowhead were found in the cave.[112] The iron projectile, which was exceptionally found stuck in the ceiling of the cave's mouth, was published as an arrowhead. This identification, it should be noted, is widely accepted among the scholars. Eshel and Zissu, for example, brought it as a parallel to the bodkin arrowhead unearthed in Abi'or cave (Eshel and Zissu 1998, 142). However, a comparison between the lengths of the heads reveals that the Pool cave's head is nearly double the size of the Abi'or cave one. Hence, it is clear that the large proportions of the head from the Cave of the Pool would have certainly been too heavy as an arrowhead. It thus appears to be an artillery *catapult* bolt (see below).

1. Trilobite iron arrowhead **PL. V.20: 3, V.20: 5E**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:....Avigad (1961)
Provenance:...Rooms II-III
Dimensions –
Length:.....42mm
Width of wings:...6.5mm
Length of tang:....21mm

Published by Avigad (Avigad 1962, 183, Pl. 18c), the arrowhead has a damaged tip, due to impact. This may well be the elucidation for its bent vane. Another vane has a slightly damaged barb. The head belongs to sub-type C (Stiebel 2003a, 217).

2. Trilobite iron arrowhead **PL. V.20: 4B**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:...Porat (2003)
Dimensions –
Length:.....56mm
Width:.....7-10mm
Length of tang:...22mm

Tanged iron trilobate arrowhead. Tip is slightly bent due to impact and vane suffered from corrosion. The head belong to Type A (Stiebel 2003a, 217).

Parallels: See previous item

3. Trilobite iron arrowhead **PL. V.20: 4A**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:...Porat (2003)
Dimensions –
Length:...39mm+
Width:....12mm

[112] Recently, in the entry of the Cave of the Pool in the *NEAEHL*, the arrowhead and the bolt head from Avigad's excavations were erroneously reported as bronze heads, rather than iron (*NEAEHL* III, 832).

Heavily corroded arrowhead. The tang is missing.

Parallels: see No. 1.

Arrowshafts

Remnants of arrowshafts, which as in the rest of Palestine combines wooden foreshaft and reed stele, were found in the cave. Parallels were discovered in Second Revolt context at the adjacent refuge caves – nearby at Har Yishai Cave (Stiebel 2004b, 119-127), the Cave of Letters (V.24), the Cave of the Arrows (V.28). Wooden foreshafts were unearthed at Masada, in a First Revolt context.[113] In the East further examples are reported from 3rd century Dura-Europos. In the West wooden foreshafts were uncovered at Vindonissa (CH) (Unz and Deschler-Erb 1997, 23-24, Taf. 21, nos. 388-398).

4. Wooden arrow foreshaft **PL. V.20: 5A**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Rooms II-III
Excavation number:....Unknown
Material:.....Wood
Dimensions –
Length:.....*c.* 207.5mm
Diameter of shaft:...*c.* 13.75-6.25mm
Length of tang:.....*c.* 47.5mm
Diameter of tang:....*c.* 10-3.75mm

Complete, wooden foreshaft.

5. Wooden arrow foreshaft **PL. V.20: 5B**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Rooms II-III
Excavation number:...Unknown
Material:.....Wood
Dimensions –
Length.....*c.* 175mm
Diameter of shaft....*c.* 8.75-6.25mm
Length of tang.....*c.* 45mm
Diameter of tang.....*c.* 7.5-2.5mm

6. Wooden arrow foreshaft **PL. V.20: 5C**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Rooms II-III
Excavation number:...Unknown
Material:.....Wood
Dimensions –

[113] Yadin 1966, 57 (bottom right).

Length:.....*c.* 207.5mm
Diameter of shaft:...*c.* 13.75-6.25mm

7. Wooden arrow foreshaft **PL. V.20: 5D**
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Rooms II-III
Excavation number:...Unknown
Material:.....Wood
Dimensions –
Length:.....*c.* 215mm+
Diameter of shaft:...*c.* 9mm

8. Wooden arrow foreshaft (not illustrated)
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Rooms II-III
Excavation number:...Unknown
Material:.....Wood
Dimensions –
Length:.....*c.* 132.5mm
Diameter of shaft:...*c.* 10mm

9. Wooden arrow foreshaft (not illustrated)
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Room I
Excavation number:...Unknown
Material:.....Wood
Dimensions –
Length:.....91mm (damaged)
Diameter of shaft:.....9-10mm

Broken at both ends. Part of the tang is still visible. Well shaped, first with knife than polished.

10. Wooden arrow foreshaft (not illustrated)
Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....Room I
Excavation number:...Unknown
Material:.....Wood
Dimensions –
Length:.....98mm (damaged)
Diameter of shaft:.....7-9mm
Length of tang:.....49mm

M. Torsion artillery

Catapult bolt

An iron bodkin head was found in the Pool Cave in a unique context. The tanged square sectioned head was discovered stuck to the ceiling of the cave (*cf.* V.13/M.1). The size and weight of some of the head suggest it would have been far too large and heavy for ordinary arrow. Arrowheads of square or rhomboid section from the First Revolt were recovered at Meroth (III.1/I.1, 4-6), Gamala (III.3/I), and the Site of the Caves (III.5/I.1-35). Sites of the Second Revolt: Sandal Cave (V.14/I.1), Spear Caves (V.17/I.1). See also the ROM collections (VI.5/I.1). They are notably smaller and much lighter than the Cave of the Pool's head. Nevertheless, actual tanged iron bolt heads are present at Meroth (III.1/M.2-3). In the East: Dura-Europos (SY) (James 1990, 94, Nos. 41-51, 63-64), Qasr Ibrim (EG) (James and Taylor 1994) and Bastam (IR) (Kleiss 1972, 52, Abb. 49, Nos. 3-5, 8, 10-11). In the West: Vindonissa (CH) (Unz and Deschler-Erb 1997, Nos. 421-458, Taf. 22 – with extensive bibliography); Augusta Raurica (CH) (Deschler Erb 1999, Nos. 1-35); Saalburg (DE) (Baatz 1966, 205, Abb. 1; 2); Newstead (UK) (Curle 1911, 189, Pl. XXXVIII: 9-11)[114]; Caerleon (UK) (Nash-Williams 1932, 71, Figs. 20-21).

According to the parallels from Dura-Europos and Qasr-Ibrim the tanged bodkins were attached to wooden shafts. These shafts had wooden vanes which acted as stabilisers for the missile.

Iron tanged bolts

1. Tanged bolt of square section **PL. V.20: 6**

Site:.....Nahal David, Cave of the Pool
Context:.....Refuge cave
Expedition:.....Avigad (1961)
Provenance:.....The ceiling of the cave's entrance
Excavation number:...Unknown
Dimensions –
Length:.....93mm
Maximum width:....10mm
Length of tang:.....21mm

The tang is broken. Published by Avigad as an arrowhead (Avigad 1961, 10, Pl. 3: 8). The size of the head and consequently its weight appears to be too large and heavy for standard arrow. In the east similar heads, which were regarded as bolts, are known from Qasr-Ibrim, Egypt (James and Taylor 1994), Dura-Europos (SY) (James 1990, Pls. 2.7.C 41-48, 2.7.D 49-50) and from Bastan (IR). The bodkin bolt is common in the west, and to be found in Saalburg (DE) (Baatz 1966, 205, Abb. 1; 2), Newstead (UK) (Curle 1911, 189, Pl. XXXVIII;

[114] Erroneous identification in Pl. XXXVII: 11.

9-11 and also erroneously identification in Pl. XXXVII; 11), Careleon (UK) (Nash-Williams 1932, 71, Figs. 20-21).

V.21 – Cave 181, 'Ein Gedi

Map ref.: 18740 09783

PL. V.21

This cave is situated in the cliff at the foot of Har-Yishai, several hundreds meters north of the field school of 'Ein Gedi (**PL. V.21: 1**). It was excavated by Bar Adon (Bar Adon 1972, 143-144), and was recently re-surveyed (Porat, Eshel and Frumkin 2004, 16).

Militaria

A *caliga* hobnail and a single trilobate iron arrowhead and were found in the cave (Porat, Eshel and Frumkin 2004, Pl. 9: 1, 3; Stiebel 2004b, 127).

Catalogue

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail **PL. V.21: 2**

Iron *caliga* hobnail. It has a short pointed stem with rectangular cross-section and a beaten dome-head.

I. Archery

Iron arrowheads

1. Trilobate arrowhead **PL. V.21: 3**

Site:.....Cave 181
Expedition:.....Eshel 2003
Material:.....Iron
Dimensions –
Length:.....47mm
Width of head:...29mm
Length of tang:...18mm

A trilobate arrowhead with round vanes (sub-Type E). The tip is slightly bent, seemingly due to impact. The tang is round in croos-section.

V.22 – 'Ein Gedi

Map ref.: 1875 0978

Other names: Engedi; Engaddi

PL. V.22-V.22B

Reference: *TIRIP*, 121; *NEAEHL* I, 399-409

History

The oasis of 'Ein Gedi attracted humans from a very early date.[115] A combination of several flowing springs on the arid shores of the Dead Sea, provided perfect conditions for fleeing rebels, refuges and hermits who sought shelter and isolated surrounding (**PL. V.22: 1**). On the other hand, peasants have found here ideal conditions for the cultivation of desert flora, most notably the *balsam*.

During the second temple period the main settlement shifted from Tel Goren to a shallow hill, north-east of the mound lasting throughout the Roman and Byzantine periods. The Romans had a clear economical interest in the maintenance of the balsam's cultivation (*NH* 12.111, 113 and 118; P. Mas. 725 – *Masada* II, 68-70), which is best manifested by the assignment of an auxiliary unit – *Cohors I Miliaria Thracum* – at the site (Lewis, Yadin and Greenfield 1989, 41-46). The erection of a Roman military bathhouse that was excavated at 'Ein Gedi is related to the latter unit (Stiebel forthcoming b; Mazar and Dunayevsky 1964; Mazar and Dunayevsky 1967, 142-143). The origin of the ritual vessels' hoard from the Cave of Letters was most likely this Roman camp.

Little is known, archaeologically speaking, about the likeness of the settlement of second century 'Ein Gedi. The information largely derives from scattered historical references, most notably the documents of the Babtha archive.[116] The location of the military camp is offered to be in the centre of the village (Cotton 2001, 147-148) or west of the bathhouse (Sar-Avi 2003, 127-128). During recent salvage excavations that preceded the erection of a tent over the Byzantine synagogue of 'Ein Gedi, Hadas exposed loci which belonged to the Jewish settlement of the Second Revolt (Gideon Hadas, *pers. comm.*).[117] The excavation reached Second Revolt levels, in which two iron trilobate heads were uncovered. The excavations at the Byzantine village have reached at several locations Second Revolt contexts, in which some *militaria* artefacts were exposed (Yizhar Hirschfeld, *pres. comm.*).

Militaria

A chalcedony *phalera* was found on the surface of Tel Goren (**PL. V.22A: 2-5, V.22B: 1**; Stiebel forthcoming a). Two iron trilobite heads were unearthed by Hadas, while an

[115] Attested by the Chalcolithic shrine and the drilled conic features near the spring.

[116] On the excavation of the Cave of Letters see: Yadin 1963a.

[117] I am most grateful to Gideon Hadas (IAA) for the permission to study the military finds from his yet unpublished excavation.

additional head was recently unearthed by Hirschfeld. The later expedition also unearthed two suspension loops of a Roman *pugio*.

Catalogue

F. Edged arms

Daggers

1. Suspension loop **PL. V.22: 3**
Site:.....Ein Gedi
Expedition:.....Hirschfeld 2000
Excavation number:...L. 4194; B. 42732
Material:.....Copper alloy
Dimensions –
Loop:.....30x23mm
Bar::.....1x2.5mm
Thickness of pins:...1.5mm
Length of pins:.....5mm

A fragmented tendril suspension loop of a dagger. It was found under a Late Roman house, where probes pits have reached the Early Roman level. It thus seemingly dates from the period between the two Jewish revolts. The bar has a rectangular section, the ends of which were shaped as scrolls that originally accepted two studs. The heads of the latter are now missing. Soldering remains are visible near both the external scroll peaks, the points where it was attached to the embracing flat band that linked the loop to the scabbard, now missing. The size of this suspension loop is slightly larger than parallel items.

In Palestine, such loops are known from Masada (III.19/F.26-27), Gamala (III.3/F.20-22) and Herodium (Stiebel 2003a, 224, No. 3, Fig. 8), while in the West examples are reported from: Mainz (DE) (Obmann 2000, D 21, Taf. 11-13); London (UK) (Grew and Griffiths 1991, 76, Nos. 157-159, Fig. 15); Kempten (DE) (Bishop and Coulston 1993, note 34, Fig. 40, 2:C); Velsen (NL) (Morel and Bosman 1989, 183, Figs. 7-8, 9B).

2. Suspension loop **PL. V.22: 2**
Site:.....Ein Gedi
Expedition:.....Hirschfeld 1998
Excavation number:...L. 3259; B. 32894
Material:.....Copper alloy
Dimensions –
25x20mm
Loop:.....21x15mm
Bar:.....3x1.5mm
Diameter of pin head (loop):....3.5mm
Diameter of pin (hinge):.....2mm

Hinged tendril suspension loop of a dagger. The object derives from a fill under a floor level. It is a mixed locus with culture material from the 1st century AD (including one coin of Agrippa (AD41) and a fragment of a glass beaker from the Early Roman period) as well as

Roman coins of the 4th century AD. The loop is broken as one of scroll terminals of the framing band. This band has a hinge, which consisted of a single pin that passes through two projections. Small pins with flat heads decorated the tendril ends of the loop, one of which is still visible. The hinged loop is very close in form to an example from Masada (III.19/F.26). For parallels see previous item.

I. Archery

Arrowheads

Iron arrowheads

1. Iron trilobite arrowhead **PL. V.22A: 1**
Site:.....Ein Gedi
Expedition:.....Hirschfeld 1998
Excavation number:...L. 4131
Material:.....Iron
Dimensions –
Total length:.....49mm+
Length of blade:...40mm
Width:.....14mm

The corroded head has one damaged wing and a bent and broken tang. Its wings taper – vane Type B. It was found in an early Roman period – Layer IV, which is dated to the Herodian period, prior to the First Revolt (Yizhar Hirschfeld, *pers. comm.*). Parallels are known from both the First and Second Revolts.

2. Iron trilobite arrowhead **PL. V.22: 4**
Site:.....Ein Gedi
Expedition:.....Hadas 1993
Excavation number:...L. 520; B. 191
Material:.....Iron
Dimensions –
Total length:.....35mm+
Length of blade:...29mm
Length of tang:.....8mm+
Height of wing:.....8mm
Weight:.....3.99gr+

Corroded, tang and tip of head are broken. The type of vanes is indiscernible. Reported by the excavator to be from Second Revolt context (Gideon Hadas, *pers. comm.*). Similar to the previous item.

3. Iron trilobite arrowhead **PL. V.22: 5**
Site:.....Ein Gedi
Expedition:.....Hadas 1993
Excavation number:...L. 520; B. 166
Material:.....Iron
Dimensions –
Total length:.....32mm+

Length of blade:...26mm+
Length of tang:.....6mm+
Height of wing:.....9mm
Weight:.....4.98gr+

Corroded, tang is broken. The type of vanes is indiscernible. Reported by the excavator to be from Second Revolt context (Gideon Hadas, *pers. comm.*). Similar to the previous item.

V.23 – Nahal Arugot, Cave 349

Map ref.: 18330 09745

Geography and history

PL. V.23

The natural cave (7x13m) is situated in the northern cliff of Nahal Arugot. The mouth of the cave is about 20m high and the ceiling of the elevated interior hall raises to the height of 8m (**PL. V.23: 1**). The ascend to the cave is very difficult. The cave has suffered from illicit excavations. It was surveyed by Bar Adon in 1963[118], Hadas in 1982[119] and recently by Porat (2003).[120] The pottery sherds testify to human occupation during the Iron Age and the Second Revolt period.

Militaria

During the recent survey, following an examination with a metal detector, a fragment of the knobbed terminal of a scabbard chape was revealed. It is to date the only clear example of edged weapon's fitting from the Second Revolt.

Catalogue

F. Edged weapons

Scabbards

1. Terminal of *gladius*'s scabbard chape **PL. V.23: 2**

Site:.....Nahal Arugot, Cave 349
Provenance:...Refuge Cave (?)
Expedition:....Eshel 2003
Material:.....Copper alloy, iron and lead (?)
Dimensions –
Length:.....30mm+
Length of knob and band:...13+9mm
Diameter of knob:.....15mm
Width of U-guttering:.....5mm

A copper-alloy knobbed terminal. Uniquely, the sphere object was constructed from two hemispherical halves, as indicated by the circumferential groove. Its heavy weight suggests that the terminal had a leaden core. It is crowned by a band, decorated by three horizontal ridges from which stems the fragmentary iron U-guttering. The band appears to be fastened by means of a perpendicular element that was soldered. Close parallels to this object are known from Israel: Masada (III.19/F.19), Gamala (III.3/F.5-6), and in the West: Verulamium (UK) (Webster 1958, 90, No. 199, Fig. 7 – with references); Vindonissa (CH) (Unz and Deschler–Erb 1997, Nos. 126-127, 136-140 and 172-173, Taf. 8-9 – see p. 17 for references).

[118] An internal report of the Antiquity Department (to day: *IAA*) (09.09.1968). I thank Roi Porat for this information.
[119] *HA* 82 (1983).
[120] As part of the survey of Bar-Ilan University, headed by Hanan Eshel.

Nahal Hever (Wadi Khbara)

Reference: *TIRIP*, 191

Nahal Hever (in Arabic – Wadi Khbara) is one of the largest dry canyons of the Judaean Desert, the estuary of which flows some 7km south of 'Ein Gedi. Its caves were initially explored in late 1953, by Aharoni's expedition. Excavations in the Cave of Horror were initiated in spring 1955 (V.26). This cave and the Cave of Letters (V.24) were subject for extensive excavations in 1960-1961 by Aharoni and Yadin, respectively. Two temporary Roman siege camps were uncovered on the edge of the cliffs above each of these caves. The Tetradrachm cave, which is situated upstream towards west and has suffered a prolonged illicit digging activity, was excavated by Amit and Eshel in 1991 (V.25).

V.24 – The Cave of the Letters

Map ref.: 1828 0933

Other names: Cave 5/6 Hev

PL. V.24-V.24D

Reference: *NEAEHL* III, 829-832

Geography and history

The large Karstic cave is situated in the northern cliff of Nahal Hever. It has two entrances, 7m apart, that are located some 200m above the river bed and 100m below the head of the sheer cliff (**PL. V.24: 1**). The cave is 150m long and consists of three halls (**PL. V.24: 2**). It was surveyed by Aharoni and excavated by Yadin in 1960-1961. The celebrated discoveries made in it during these two consecutive seasons included among others groups of papyri and documents, most notably letters of Simeon Bar-Kosiba (Bar-Kochba), the leader of the Second Revolt, and the archive of Babatha (Yadin 1963a).

Militaria

The cave that was used as a hideout for the rebels yielded military equipment finds, part of which have been seemingly manufactured by the rebels while others were clearly looted from the Roman unit that stationed at nearby 'Ein Gedi.

In addition to archery equipment (arrow and arrowheads), a clasp knife, leather sheath, a complete net, saddle cover and a group of pagan cult utensils was found in the cave. The latter most likely belonged to the Roman unit that garrisoned at 'Ein Gedi in the eve of the Second Revolt's outbreak.

Catalogue

F. Edged weapons

1. Clasp-knife

PL. V.24A: 2

Site:.....Cave of Letters
Provenance:.....Refuge cave
Excavation No.:...61.2.4 (No. 29)
Material:.....Wood + iron
Dimensions –

See Section F.3.4 (*ibid.*, 88, PL. 24, Fig. 31).

2. Knife sheath **PL. V.24A: 1**
Site:.....Cave of Letters
Provenance:.....Refuge cave
Excavation No.:...59.9 (No. 25)
Material:.....Leather (sheepskin)
Dimensions –
Length:...200mm
Width:....30mm

See Section F.5.2.1 (*ibid.*, 165, Pl. 51).

I. Archery

Like in other Judaean Desert refuge caves the archery tackle was found in the two entrances of the cave. This context may be explain by incoming Roman fire. However, as the mouths to most of which, like the cave under discussion was beyond the range of Roman bows, it appears likely that this location represents a watch-post of the rebels.

1. Arrow **PL. V.24C: 1A, 2A**
Site:.....The Cave of Letters
Provenance:.....Refuge cave – Entrance I
Expedition:.....Yadin 1961
Excavation no.:...No. 40 – I.5
Material:.....Iron, wood (Tamarix), sinew
Dimensions –

Arrowhead
Length:.....25mm
Width of wings:...4mm

Arrowshaft
Length of shaft (wooden foreshaft and a scant part of the reed stele):...213mm
Diameter of shaft:.....8mm
Length of sinew binding:...26mm

The fragmentary arrow comprises of a small trilobate arrowhead, a complete wooden foreshaft and scant remains of the reed stele (*ibid.*, 91, PL. 25, Fig. 32).

The iron trilobate head is strongly barbed (sub-type D) (Stiebel 2003a, 217). The tip of one of its barbs is damaged. Parallels for the iron tanged trilobate arrowheads: Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91) and Kh. Qumran (de Vaux 1973, 36). Refuge caves of the Judaean Desert – the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b), the Cave of the Pool in Nahal David (V.20/I; Avigad

1962, 183, Pl. 18c), Har-Yishai Cave (Stiebel 2004b, 119-121), the Murabba'ât caves (V.16/I.3-5; de Vaux 1961, 37, Fig. 9: 6-8), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

The foreshaft was produced from Tamarix deserti Boises (Yadin 1963a, 91, note 110). Its tang was introduced into a reed stele and the joint was strengthened by a sinew whipping (Har-Yishai Cave: Stiebel 2004b, 121-127).

2. Arrowhead **PL. V.24C: 1B, 2B**

Site:.....Cave of Letters
Provenance:.....Refuge cave – Entrance II
Expedition:.....Yadin 1961
Excavation no.:...II.9 (No. 38)
Material:.....Iron
Dimensions –
Length (max.):....46mm
Length of tang:....20mm
Width of wings:...14mm

Iron trilobate arrowhead (sub-type B) (Yadin 1963a, 91, Pl. 25, Fig. 32). For parallels, see previous item.

3. Arrowhead **PL. V.24C: 1C, 2C**

Site:.....Cave of Letters
Provenance:.....Refuge cave – Entrance II
Expedition:.....Yadin 1961
Excavation no.:...II.10 (No. 39)
Material:.....Iron
Dimensions –
Length (max.):....30mm+
Length of tang:....6mm+
Width of wings:...14mm

Iron trilobate arrowhead (sub-type C) (*ibid.*). For parallels, see No. 1.

P. Varia

1. Net (hunting or gladiatorial?) **PL. V.24B: 1 (A-D)**

See: Yadin 1963a, 267-268, Pls. 101-102, Figs. 89-90.

Q. Riding equipment

Yadin offered to interpret part of the leather objects found in the cave as leather garments (*ibid.* 164-165, Pl. 56). He referred to this group as follows:

> 'At various loci – but mainly in Locus 2 – a number of fragment of leather garments were found. Most are badly torn, and thus it is almost impossible to reconstruct their original forms. Likewise, it is impossible to determine the exact number of such garments, for many fragments may be of one and the same

garment. In any event, the overall number of leather garments is not great. Could they have been of a military nature? (remains of similar tunics were also found at Muraba'at; in view of our finds, it is not necessary to ascribe them to Roman soldiers, as is done in *DJD* II, p. 35) They are extremely well sewn and the stitching holes for the thongs are carefully executed (*ibid.* 164).'

However, at least some of the fragment of this group (No. 21) bear close resemblance to saddle covers from the Roman West.

1. Saddle cover **PL. V.24D: 1**
Site:.....Cave of Letters
Provenance:.....Refuge cave
Expedition:.....Yadin 1961
Excavation No.:...51.2 (No. 21)
Material:.....Leather

Yadin described this group as: 'fragments of a large sheet of leather. Sleeve-holes are evident; the stitching is excellent...Vegetable (pomegranate) tanned sheepskin' (*ibid.*, 165). The published photograph in Yadin's report comprise only part of the object. An examination of this finds suggested the fragments forms part of a leather saddle cover. This notion is particularly supported upon the combination of the rounded and triangular elements, which appears to be a horn and dart that are typical of the front saddle cover. The base of the pommel is 180mm in width. The dimensions of the entire composite object is *c.* 1150x1110mm. It may be that the saddle cover was scavenged and reused, with other fragments, to form a large sheet of leather that was utilized by the rebels.

Parallels: van Driel-Murray 1989b and Winterbottom 1989.

T. Cult utensils

1. A group of copper-alloy cult vessels (not illustrated)

See: Yadin 1963, 37-38, Pls. 11-12; For discussion see the relevant finds in pp. 42-100.

V.25 – Nahal Hever, Tetradrachm Cave Map ref.: 1704 0961

Other names: Sela' Cave **PL. V.25**

Geography

In 1991 a cave situated in the cliff of one of the upper rivulets of Nahal Hever was surveyed by David Amit. Later that year an expedition headed by David Amit and Hanan Eshel, excavated the cave, on behalf of the IAA (Amit and Eshel 1993, 107-108). The cave is located *c.* 12km upstream from the Cave of the Letters, consist of few openings that lead to three main halls through *c.* 200m of network of tunnels (**PL. V.25: 1**).

History

The Majority of finds are typical to the Bar-Kokhba period and have parallels in the Judaean Desert refuge caves. Ceramic sherds of storage jars, lamps, cooking pots as well as many fragments of glass vessels were uncovered. Nails, rings, some remains of organic nature and two *ostraca* were also found. The established date of the days of the Second Revolt was strengthen by a silver Tetradrachm (Sela') of year 3 of the revolt (AD134) that also granted the cave its name.

Militaria

Three iron projectiles were uncovered, including one trilobate tanged arrowhead and two javelin heads.

Catalogue

H. Shafted arms

Javelin heads

1. Light throwing javelin head **PL. V.25: 2**
Site:.....Tetradrachm Cave
Expedition:....Amit and Eshel (1991)
Provenance:...Terrace adjacent to cave's mouth
Material:.....Iron
Dimensions –
Length:.....41.5mm+
Length of blade:.....24mm+
Width of blade:.....17.5mm
Thickness:.....4mm
Length of collar:.....4mm
Thickness of collar:...7.5mm
Length of tang:.....13.5mm+
Diameter of tang:.....5mm

Fragment of a cast iron javelin head with very flat lensly cross-sectioned blade. Most of the tapering blade is now missing. The head is collared. From the collar tapers a round-sectioned

tang, the tip of which is broken. The collared javelin head is typical of the Second Revolt period. Parallels are attested in the Judaean Desert refuge caves: The Large Caves Complex (V.15/H.1); Cave FQ37 (III.18/H.1) and the Murabba'ât Cave (V.16/H.4). A fragment was further found at the Site of 'Bypass Shoham' (V.10/H.1).

2. Iron javelin head (not illustrated)
Site:.....Tetradrachm Cave
Expedition:.....Amit and Eshel (1991)
Provenance:.....Hall B (Refuge cave)
Excavation number:...L. 200; B. 5
Material:.....Iron
Dimensions –
Length:.....49mm+
Length of blade:...23mm+
Thickness:.....7mm
Length of tang:....26mm
Width of tang:.....6-12.5mm

The broken blade has an oval cross-section and is slightly deformed (seemingly the due to impact). The tang is unusually wide at its head hence leaving very narrow shoulders, at the blade's base. The tang tapers towards its tip and has an oval section at its centre and circular at the tip. On first glance the non-regular tang's shape may suggests an identification of a knife rather than a projectile head. However, no parallel of such a tanged knife is known. Indeed, an iron javelin head found at Herodium clearly indicates the head under discussion should be similarly regarded (Stiebel 2003a, 226, No. 6, Fig. 13).

I. Archery

Iron Arrowheads

1. Iron trilobate arrowhead **PL. V.25: 3**
Site:.....Tetradrachm Cave
Expedition:.....Amit and Eshel (1991)
Provenance:.....Refuge cave
Material:.....Iron
Dimensions –
Maximum length:.....30mm+
Length of head:.....25mm+
Width of wing base:...7mm
Length of tang:.....7mm+

Iron trilobate tanged arrowhead. The poorly preserved head lacks one of its wings and the two others are damaged. The tang of the head is bent and its tip is missing.

Parallels: First Revolt – Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91) and Kh. Qumran (de Vaux 1973, 36).

Second Revolt: Refuge caves of the Judaean Desert – the Cave of Letters (V.24/I; Yadin 1963b, 91, Nos. 38-40 (II.9-10 and I.5), Fig. 32, Pl. 25) in Nahal Hever, the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b), the Cave of the Pool in Nahal David (V.20/I; Avigad 1962, 183, Pl. 18c), Har-Yishai Cave (Stiebel 2004b), the Murabba'ât caves (V.16/I; de Vaux 1961, 37, Fig. 9: 6-8), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

V.26 – Nahal Hever, Cave of Horror

Map ref.: 1826 0925

Other names: Cave 8 Hev

PL. V.26

Reference: *NEAEHL* III, 827-829

History

In May 1955 the cave that is situated in the southern cliff of the lower part of Nahal Hever was first explored by Aharoni. It is very difficult to access its square entrance which is situated some 80m below the sheer cliff's top. The natural cave is 65m long, shaped as a long corridor that terminates in a hall (**PL. V.26: 1-2**). Few chiselling marks were observed and a small niche was closed by a stones-built wall in the cave's centre. The cave was thoroughly excavated in 1961 by the Joint Judaean Desert expedition under the management of Aharoni (Aharoni and Rothenberg 1960, 115-157; Aharoni 1961). A small Roman temporary camp (known as Camp B) was surveyed above the Horror Cave (Aharoni *et al.* 1961, 152ff). It is smaller than its counter camp (Camp A) that was pitched above the Cave of Letters on the northern bank of Nahal Hever (V.24).

Militaria

Iron trilobate were found in the cave and a rare leather saddle's pommel facing. A group of iron utensils that was uncovered in the cave was mistakenly reported to comprise a arrowhead/javelin head and a small axe (Aharoni 1962, 19, Pl. 27 B (middle)).[121] The objects are in fact an iron drill-bit and a semi-lunette knife (Stiebel 2001).

Catalogue

I. Archery

Several trilobate arrowheads were apparently unearthed in the cave (Aharoni 1962, 193), although their number and any additional detail were not available.

Q. Riding equipment

Saddle leather cover

1. Pommel leather facing **PL. V.25: 3**

Site:.....The Cave of Horror
Provenance:...Refuge cave
Expedition:....Aharoni 1961
Material:.....Leather
Dimensions –
Length:.....125mm
Width:.....125mm

[121] Also repeated in Eshel and Zissu 1998, 142; Porat and Eshel 2002, 98.

Thickness:...2.5-3.5mm

The pommel facing was produced a rather thick hide (2.5-3.5mm). A single line of stitching holes is perforated along it perimeter. Scant remains of the seam have survived.

Parallels: Cave of Letters (V.24/Q.1). In the West: van Driel-Murray 1989b and Winterbottom 1989.

Nahal Mishmar (Wadi Mahras)

Nahal Mishmar is situated 5km north of Nahal Se'elim, it drops from the Judaean Desert eastwards to the Dead Sea valley some 300 hundred meters. The caves of Nahal Mishmar were surveyed and excavated in 1960 and 1961 (Camp C) by Bar Adon. The most renowned discovery was the Treasure Cave that yielded a hoard of 429 objects from the Chalcolithic period, most of which are made of copper (Bar Adon 1980).

V.27 – Nahal Mishmar, Cave 5

Map ref.: 181 088

PL. V.27

Geography and history

Cave 5 is the largest of the Nahal Mishmar caves – some 76m long (**PL. V.27: 1-2**; Bar Adon 1980, 11). Situated in the Southern cliff, the Karstic cave was merely surveyed during the third season (March 1962) and still awaits excavations thus dating this group is an unattainable objective. Nonetheless, clear evidences for human activity were detected in the cave, among which construction works that adjusted it as a shelter place.

Militaria

Five pointed sticks were found in the cave. Of interest is also a bundle of sinew that was bound by a leather band (**PL. V.27: 3**).

Catalogue

H. Shafted weapons

1. Group of five wooden projectiles (?) **PL. V.27: 4**

A group of pointed 'sticks' was discovered in Hall I of Cave 5 (Bar Adon 1980, 10-11). It is not clear at all whether these points should be interpreted as weapons. In the National Geographic volume of September 1999 (Vol. 196, No. 3), a Mongolian bird hunter is documented employing a net that is stretched upon the wooden frame made up of seven sticks, that are rather similar in shape to those under discussion (for a complete net from the Cave of Letters: **PL. V.24B: 1 (A-D)**). However, should the points were indeed intended for military purposes, it is not an isolated example of a local improvises production of wooden arms, which lacked any metal parts whatsoever. For example wooden arrow footing were reported from Dura-Europos (James 1990, 85-86). Such wooden tipped objects are documented in varied eras, geographical localities and traditions. The Germans are noted by Tacitus to employ short javelins alike (Tact. *Ann.* 2.14). The sources further note the hardening of the tip by fire (*praeūro*) (*ibid.* 4.51; Livy 1.32.12).

The points exhibit the following Dimensions –

Point 1 – Length: 535mm; diameter: 12mm

Point 2 – Length: 252mm; diameter: 12mm

Point 3 – Length: 480mm; diameter: 10mm

Point 4 – Length: 432mm; diameter: 12mm

Point 5 – Length: 336mm; diameter: 8mm

Point 6 – Length: 504mm; diameter: 12mm

Point 7 – Length: 430mm; diameter: 12mm

Nahal Se'elim (Wadi Syâl)

Nahal Se'elim is one of the longest canyons of the Judean Desert. Although dry throughout the year, winter flash floods feed small pools (*gevim*), which hold the water for several months (Tsfira and Na'ama pools). Four small springs are located along the canyon's bed: 'Ein Aneva, 'Ein Namer, 'Ein Se'elim and 'Ein Tsaftsefa. Following reports about unearthed scrolls in illicit excavations conducted by Bedouins that cross the border between Israel and Jordan, Aharoni conducted a survey in Nahal Se'elim, the success of which have initiated the expedition of the Judaean Desert Caves (1960-1961).

A group of refuge caves from the Second Revolt was surveyed by Aharoni and Avigad. It is clear that some of the caves were prepared in advance by Jewish rebels and were intended for prolonged stay, best exemplified by Cave 40 in the near by Nahal Hardof, in which a plastered pool (2.6 cu. meters) was found (1795 0862). Other caves of very small dimensions suggest a relatively short period of occupation by Jewish fugitives.

V.28 – Cave of the Arrows

Map ref.: 1791 0853

Other names: Cave 31

Reference: *NEAEHL* III, 822

History

The small cave is situated in the northern cliff of Nahal Se'elim (Wadi Syâl). It was excavated in two days, during the first season of the survey and excavations at the caves of the Judaean Desert (1960). The cave was first inhabited during the Chalcolithic period, as attested by the typical pottery sherds. It was latter occupied in the second Jewish revolt which may clearly deduced from the find of a silver *denarius* of Trajan minted in AD 103-111 (Rahmani 1960, 63, Pl. 10D), and culture material, mainly pottery.

Militaria

A large group of archery equipment was found in the cave, to which Aharoni have referred to as an 'arsenal'. The latter group consisted of 11 trilobate arrowheads, and numerous remains of arrows' shaftments.

Catalogue

I. Archery

Arrowshafts

Aharoni, the head of expedition B, produced a very succinct report that describes the finds. Unfortunately, his report lacks details such as the exact number of the arrow-shafts' fragments:

> 'Most interesting was an arsenal of arrows in a corner of the cave. Near eleven triangle-shaped iron arrow-heads were a large number of shafts whose upper parts were made of wood, 14-20 cm. long, and the lower parts of cane. It was clear from a large number of the cane shafts that these were longer than the wooden ones, but it is difficult to estimate their exact length. The wooden parts are sharpened at the ends and fitted into the cane shafts. The points at which the wooden and cane shafts are joined and the arrow-heads are fitted in, were carefully tied with sinew. The cane is painted red and black at the end and in notched for the bow-string' (Aharoni 1961, 20).

A more colourful description was published in a popular journal by one of the four excavators of the cave (Micha [Mike] Livne). The main interest lies in the estimation of the number of shafts fragments there unearthed:

> 'Normally, the most intriguing find in the excavations at the Judaean Desert is the organic material remains. The arid climate that endure here all year long preserves well the remains... But above all we have found dozens upon hundreds of sticks of two kinds: wooden sticks, one centimetre wide and 20 centimetre long. At one end they are socketed, and on the other they are slightly pointed (sharpened); and cane-sticks of the same dimensions, which are notched on one end. The canes are painted red, and two black lines encircle them. The socketed end of the wooden sticks is wrapped by a wire smeared in wax, a very delicate wire. Upon almost all the sticks the wire survived intact: it did not loosen or rotten. This find was a puzzle in our eyes. We browsed through the primitive spinning and weaving processes to find the function of these sticks. During our symposium... concerning the use of the sticks in the life of Bar-Kochba's rebels, the solution was found. Benny, that did not settle by the coin that he has found, and stunned us from time to time by the false alarm "I have found another coin" – rose up, and as usual stated "another coin", adding (typically to him) "this time for real", and handed me over an iron arrowhead. The arrowhead had three wings, with a tang that was used to their secure in the hole pierced in the wooden stick. Now we have realized that the sticks that we have found are arrows. The tang of the arrowhead was stuck into the hole in the wooden stick. It was wrapped by a wire, to prevent the splitting of the wood. The wooden stick was

> pointed in order to introduce it to the cane. The cane was notched at its end, in order to adjust it to the bow's cord.
>
> For two days we have worked in this cave, which we named the Cave of the Arrows... the yield of arrows came to 11 iron arrowheads and hundreds of sticks and canes' (Livne 1960, 179-180).[122]

A large number of fragments came down to us. Two years of investigations and excavations in stores during the last years have revealed three groups of arrowshafts fragments, which originated in the excavations of Cave 31. One group was located in the Shrine of the Book of the IM, Jerusalem and now in the stores of the IAA. A second group, hereby discussed, was on exhibition at the 'Ein Gedi Field School. The third group of arrowshafts from Cave 31 was kept in the Institute of Archaeology of the Hebrew University, Jerusalem and is currently under going conservation process (not discussed in the dissertation).

Iron arrowheads

According to Aharoni, 11 arrowheads were uncovered in the excavations, all belong to the iron tanged trilobate type.

1. Iron trilobate arrowheads **PL. V.28A: 1A**
Site:.....Cave of the Arrows
Material:...Iron
Dimensions –
Length:.....34mm+
Length of head:.....25-26mm
Length of tang:.....10m+
Width of vane:.....7mm
Thickness of collar:...3mm
Thickness of tang:.....1.5mm

This trilobate arrowhead exhibits some unique features. The barbs of the vanes were intentionally cut (Type F); whether as part of the production process or in order to create more cutting edges that would inflict damage. The two edges of the vanes are well defined, a yet unattested feature. The tang has a small collar (3mm thick).

2. Iron trilobate arrowheads **PL. V.28A: 2A**
Site:.....Cave of the Arrows
Material:...Iron
Dimensions –
Length:.....27mm+
Length of head:.....24.5mm
Length of tang:.....4mm+
Width of vane:.....*c.* 6mm

Iron trilobate arrowhead, tang is broken and tip is bent seemingly due to impact.

[122] Translation by Guy Stiebel.

3. Iron trilobate arrowheads **PL. V.28A: 3A**
Site:.....Cave of the Arrows
Material:...Iron
Dimensions –
Length:.....29mm+
Length of head:.....23.5mm+
Length of tang:.....8mm+
Width of vane:.....*c.* 7mm

Iron trilobate arrowhead with damaged tip and broken tang. Interestingly, the three vanes are not identical in shape. Two vanes are of Type D (strongly barbed) and one of Type A (straight).

4. Eight trilobate arrowheads **PL. V.28: 3**

A group of eight more trilobate arrowheads was included in the group that was stored in the IM (Aharoni and Rothenberg 1960, Fig. 57). One of which belongs to sub-type E (rounded vanes), another to sub-type A (straight vanes) and two of sub-type B (tapering vanes). The bases of the vanes of to two arrowheads exhibit a unique sloping feature. In cross-section, the vane is tapering at its base. Is this feature reflecting the production process, or does it in fact manifest an aerodynamic knowledge?

Wooden foreshafts

5. Foreshaft **PL. V.28A: 1B**
Site:.....Cave of the Arrows
Material:...Wood
Dimensions –
Length:.....91mm+
Length of tang:...7mm+
Width:.....8-11mm

Wooden foreshaft with a neat finish. The tang is broken, while the distal end is broken and split seemingly due to impact.

Parallels: Har-Yishai Cave (Stiebel 2004b, Nos. 24, 25, 28, PL. 1, Fig. 1); Masada (Yadin 1965, PL. 23B), Cave of Letters (V.24/I.1); Cave of the Pool (V.22/I.4-10). In the East: Dura-Europos (James 1990, 84-85, 249-257, Pls. 2.6.E and F). In the West: Vindonissa (Unz and Deschler-Erb 1997, Nos. 388-398, Taf. 21).

6. Foreshaft **PL. V.28A: 2B**
Site:.....Cave of the Arrows
Material:...Wood
Dimensions –
Length:.....148.5mm
Length of tang:...39.5mm

The wooden foreshaft has a relatively thick tang. Remains of cane still adhere to the tang.

Parallels: see previous item.

7. Foreshaft **PL. V.28A: 3B**
Site:.....Cave of the Arrows
Material:...Wood
Dimensions –
Length:.....76mm+
Length of tang:...6mm+
Width:.....8-9mm

Broken tang.

Parallels: see No. 1.

8. Foreshaft **PL. V.28B: 1**
Site:.....Cave of the Arrows
Material:...Wood
Dimensions –
Length:.....180mm+
Length of foreshaft:...91mm+
Length of stele:.....91mm+
Width of foreshaft:.....6-8mm
Width of stele:.....8.5mm

Wooden foreshaft with an extended tang. The body exhibits carving marks, while remains of the reed still adhere to the tang.

Reed stele

The stele was produced from reed, an example from Masada was identified as *Typha latifolia* (Vol. I, p. 355). For cresting see: Stiebel 2004b, 123ff, Pl. 3. In the Cave of Arrows I have identified the following painted patterns (**PL. IA: 1**):

1. Black
2. Red
3. Red and black nock
4. Red and black nock with one black band at the end of the feather
5. Red and black nock with one black band at the mid feather
6. Red with 3 black bands

9. Reed stele **PL. V.28B: 2**
Site:.....Cave of the Arrows
Material:...Reed
Dimensions –
Length:.....140mm+
Diameter:...9-10mm

The distal part of the reed stele. One end is strengthen by a well preserved sinew band (18mm long), while the other end is broken.

10. Reed stele **PL. V.28B: 3**
Site:.....Cave of the Arrows
Material:...Reed

Dimensions –
Length:.....75mm+
Diameter:...9mm

The small fragment of the distal part of a reed stele. Both its ends are broken. A sinew binding strengthens one end.

11. Reed stele **PL. V.28B: 4**
Site:.....Cave of the Arrows
Material:...Reed
Dimensions –
Length:.....175mm+
Diameter:...9mm

Fragment of the middle part of the reed stele. No cresting paint is discernable.

12. Reed stele **PL. V.28B: 5**
Site:.....Cave of the Arrows
Material:...Reed + feathers
Dimensions –
Length:.....130mm+
Diameter:...10mm

The proximal part of the reed, has survived with its notched end. It is painted red with a black band. It is not clear whether the band was originally completely black or a red band bordered by two black lines. The nock is strengthened by a sinew band. The nock has square-cut wings, see also next item. This design is also attested in Har-Yishai cave (Stiebel 2004b, 124-125, No. 35, Fig. 6, Pl. 3: d). It exhibits an 'eastern' fletching geometry. In addition to the glue signs, a small fragment of a feather has survived (note arrow). The feathers were glued along the axis of the stele and appear to slightly bend to the right.

13. Reed stele **PL. V.28B: 6**
Site:.....Cave of the Arrows
Material:...Reed
Dimensions –
Length:.....140mm+
Diameter:...9-10mm

The proximal part of the reed, has survived with its notched end. It is painted red. The nock was strengthened by a sinew band, which did not preserve. The nock has square-cut wings (see previous item; Stiebel 2004b, 124-125, No. 35, Fig. 6, Pl. 3: d) and exhibits an 'eastern' fletching geometry, attested by the glue signs. The feathers were glued along the axis of the stele and appear to slightly bend to the right.

14. Reed stele **PL. V.28B: 7**
Site:.....Cave of the Arrows
Material:...Reed
Dimensions –
Length:.....130mm+
Diameter:...9mm

The proximal part of the reed, has survived with its notched end. It is painted red with black bands – black nock and two more distal bands. The nock was strengthened by a sinew band, most of which did not preserve. The deep nock has curved shape wings, parallel for which may be found in Har-Yishai cave (Stiebel 2004b, 124-125, No. 23, Fig. 6, Pl. 3: c).

V.29 – Nahal Se'elim, Cave 38

Map ref.: 176 082

Geography and History

The small cave is situated north of Tsfira pool, by the north-south pass that run along the sheer cliff. It was surveyed and excavated in 1960 by Expedition B under the management of Aharoni. The excavation yielded few finds, all dated to the Second Revolt.

Militaria

A knife's sheath made of leather was found in the cave (Ahroni and Rutenberg 1960, 179). Similar objects are reported from the Sandal Cave (V.14/F.1) and the Cave of the Letters (V.24/F.1) both in Second Revolt contexts (Vol. I, pp.120-121). The object was not available for examination as its whereabouts is unknown.

V.30 – Kh. Baghlân

Map ref.: 1366 1224

Geography and history

The site is situated on the eastern slope of a hill above a fertile valley, in the western sector of the central Shphelah. Its ruins extend over the area of 15 dunams. Surveys identified remains of structures, installations of olive oil's production and a hiding complex, typical of the Second Revolt. Few sherds from the Iron Age II were there found along with sherds from the Hellenistic, Roman, Byzantine and Ottoman periods. Members of Kibbutz K'far Menahem gathered in the sections of modern trenches complete cooking pots of the Early Roman periods, as well as coins and *ballista* balls (Zissu 1992, 161).

Militaria

As aforesaid, several *ballista* balls were discovered along with pottery from the early Roman period. The artefacts were not available for examinations at the time of writing.

V.31 – Hebron (?)

Map ref.: 160 103

Additional names: Hevron, el-Khalil

Reference: *TIRIP*, 141

Geography and history

The city of Hebron is the capital of the Southern Judaean mountains. Since biblical times it was a central city of its district throughout history. The tombs of the Patriarchs are located in the heart of the city. Hebron, which is described by Josephus during the First Revolt as a 'little town', was captured by Simon Bar-Gioras (*BJ* 4.529). The invasion of Vespasian to Judaea in June AD68 was followed by an attack against Upper Idumaea under Cerealius, one of his officers, who burnt down the city (*ibid.*, 554). Speidel re-interpreted a tile-stamp from Hebron as the monogram of *cohors I Thracum milliaria* (Speidel 1979). Hence, the city was seemingly the base of the unit during the late 1st and early 2nd century AD. A contingent of the unit garrisoned at 'Ein Gedi (V.22).

Militaria

A hoard of military equipment, acquired by Prof. S.S. Weinberg, was reported to origin in illicit digging in a cave situated in the environs of Hebron. Donated to the Israel Museum, it was conserved and restored by the Römische-Germanisches Zentralmuseums. The assemblage was published by Weinberg (Weinberg 1979), while specific items were also discussed in Robinson 1975, 71, 73, Pls. 175-178 and Garbsch 1978, 59, L 1, Taf. 14. Nonetheless, the interpretation of some of the items, deserves further consideration.

Catalogue

A. Helmets

1. Infantry helmet **PL. V.31: 1-4-V.31A: 1-6; V.31C: 2**

Complete helmet, that formed part of the 'Hebron hoard'. It belongs to Imperial-Italic type G (Weisenau type). It was published and thoroughly discussed (Robinson 1975, 71, 73, Pls. 175-178; Weinberg 1979). The helmet was elaborately decorated, exhibiting embossed floral and lunate fittings (**PL. V.31: 3-4 ,V.31A: 3**) and further featuring embossed parts, like the cheekpieces (**PL. V.31: 1-2, 4**).[123] The occiput exhibits three horizontal ridges, while three pronounced semi-circular ribs occupy the neck-guard.[124] The integral reinforcement bars (cross-bars) on the helmet reflect the adoption of this constructive feature, which was the

[123] For the symbolism of *militaria* see Section III – 5.

[124] Michael Bishop, in whose hand the notes of Russell Robinson were entrusted, informed me about the dissatisfaction of Robinson with the reconstruction of the neck-guard (*pers. comm.*).

Roman answer to the intimidating *falx* during the Dacian wars (Coulston 1988c, 192-193).[125] The ears were protected by arched ear-guards, allowing optimal hearing.

Dimensions – Height: 187mm; Width: 326mm

2. Sport helmet **PL. V.31B: 1-6**

A complete sport helmet of the 'Alexander' type', featuring a curly hair dress crowned by a wreath (Garbsch 1978, 59, L 1, Taf. 14; Weinberg 1979). The helmet is made of iron, while the adorning wreath is made of copper-alloy (V.31B: 1, 3-4, 6). Slits were cut for both eyes and mouth, while two holes were further pierced at the base of the nose as nostrils. Two pairs of holes were located below the ears to allow the attachment of the helmet's parts (V.31B: 4).

Dimensions – Height: 240mm; Width: 225mm.

3. Fragment of sport helmet **PL. V.31C: 1**

A small section of a sport helmet. The iron fragment exhibits an embossed ear motif. Three holes occupy its centre, while one attachment hole is discernable below the ear (two possible more holes are visible on the fragment's perimeter). The two straight edges of the fragment clearly indicate that it was intentionally cut from the complete helmet. This feature appears to reflect the nature of the 'hoard', which was seemingly an assemblage of looted equipment that was scavenged for its metal by the rebels and was thereafter concealed for future recycling (see: Vol. I, p. 251ff).

B. Armour

1. Mail (*lorica hamata*) **PL. V.31D**

A complete iron mail consists part of the 'hoard'. It was found folded, in a much corroded condition. As seen on the X-ray image, the mail consists of four interwoven rings (V.31D: 2). The rings were wielded rather than riveted. A raw of iron scales (below: B.2-3) that was associated with this hoard, was presumably used to create a hemline for the mail. The mail was seemingly stored folded inside the helmet, to the inner part of which a group of eleven scales still adhere. The iron disc found adhere to the mail (V.31.D: 1 – marked by a white arrow) was a central element of the fastening device of the shoulderguards. For a detailed discussion of the mail, see Vol. I, pp. 47-49.

2. Group of scales **PL. V.31C: 3**

A raw of some dozen iron scales. The flat scales lack a mid-rib and feature two pairs of holes in the upper centre part that were used for lacing to the undergarment and two pairs of lateral fastening holes that were attached by thin copper-alloy wires (V.31C: 3). The scales belong to

[125] Helmets from Berzobis (RO) (Petculescu and Protase 1975) and Brigetio (HU) exhibit crossbars that were secondary feature (Connolly 1988b, 23 – referring to three such examples).

Type 13 (Vol. I, p. 44). Iron scales from Second Revolt's contexts are reported from: Tel 'Azeqa (V.11/B.1). This single raw of scale, together with the eleven scales found corroded to the infantry helmet (below B.3), was possibly used as a hem for the mail (see Vol. I, pp. 47-49).

3. Eleven iron scales **PL. V.31C: 2**

A raw of eleven iron scales was found corroded to the inner side of the helmet. They are identical to the previous group of scale (above B.2), and most likely were originally fastened together.

C. Limb defences

Greaves **PL. V.31E: 1-3-V.31F: 1-2**

Part of the 'Hebron hoard' (V.31). See Chapter 3 (iii) *b*.

V.32 – Kh. as Salantah

Map ref.: 1464 0813

Other names: H. Tsalit, Kh. Tsalantah

PL. V.32-V.32A

References: *TIRIP*, 260

Geography and history

The site of Kh. as Salantah is situated 1km East of Meytar, on the west bank of Nahal Eshtamoa. A fortified manor house was excavated by Alon and Fabian in 1983-1987. It consists of a square tower (19x20m), from the south part of which evolves a building (30.7x18.8m), with a central courtyard around which small rooms and a storeroom were built (**PL. V.32: 1**). Both these structures exhibit two stratigraphic stages – construction seemingly in the late 1st century and fortification during the Second Revolt.

The tower have preserved to the height of one floor. Its inner space was divided into elongated storing rooms and small square rooms. Several openings located at its floor lead to an underground hiding complex. During the second stage a sloping wall that encircle the tower – as a *glacis* – was added. The entrances were narrowed and floors were raised.

The abutting court-structure also exhibits two architectural stages. A hiding complex was uncovered below the central courtyard. The inner and outer faces of the rooms' walls have been plastered. Several incisions were observed on the walls, including human figures, animals and Greek inscriptions. One of the human figures is that of a warrior, depicted carrying a long spear and a circular patterned shield (see below). The rich numismatic find retained coins from Vespasian to Hadrian's days as well as Second Revolt's coins (Zissu 220, 318-319).

Militaria

The site of Kh. as Salantah yielded several military fitting stratified in the Second Revolt destruction. Most intriguing of all is an incision of a warrior uncovered on the plastered wall of the tower (**PL. V.32A: 2**). The figure, seemingly a local warrior, is equipped by a small circular pattered shield and carries a long spear.

Catalogue

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail (not illustrated)
Site:.....Kh. as Salantah
Provenance:.....Manor house
Expedition:.....Alon and Fabian
Excavation No.:....Room 8; B. 1231

Material:.....Iron
Dimensions –
Height:.....23mm (bent: 17+6mm)
Diameter of head:...14mm

A single iron hobnail. The shank of the dome head object is bent at right angle. See below nos. 2-3. Parallels are attested in numerous First and Second Revolt contexts: siege camps around Masada (III.20/D; Gutman 1964, 115), Masada (Yadin 1965, 91), Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

2. A pair of *caliga* hobnails **PL. V.32: 2**
Site:.....Kh. as Salantah
Provenance:.....Fortified tower
Expedition:.....Alon and Fabian (1986)
Excavation No.:....Room E; L. 156; B. 1033
Material:.....Iron
Dimensions of first nail –
Height:.....10mm
Diameter of head:...14mm
Thickness of nail:...24mm

Dimensions of second nail (not drawn) –
Height:.....9mm
Diameter of head:...16mm
Thickness of nail:...23mm

Dome-head iron hobnails. See previous item.

3. A group of four *caliga* hobnails **PL. V.32: 3**
Site:.....Kh. as Salantah
Provenance:.....Fortified tower
Expedition:.....Alon and Fabian (1986)
Excavation No.:....Room V; B. 1231
Material:.....Iron
Height:.....10/8/6.5/6.5mm
Diameter of head:...15/14/14/13mm

A group of four hobnails corroded together. Part of a sole. Compare with Samaria (I.6/D.1).

I. Archery

Arrowheads

1. Iron trilobate arrowhead **PL. V.32A: 1**
Site:.....Kh. as Salantah
Provenance:.....Fortified tower (courtyard)
Expedition:.....Alon and Fabian (1985)
Excavation No.:....L. 138; B. 1011
Material:.....Iron
Dimensions –

Length:.....52mm+
Length of head:.....43mm+
Length of tang:.....9mm+
Width of vanes:.....18mm
Thickness of vanes:....2mm

Iron tanged trilobate arrowhead. The tang and tip of head is broken. The vanes are corroded.

V.33 – Nahal Yattir Site

Map ref.: 1468 0779

PL. V.33-V.33C

Geography and history

The site occupies two hills on the southern bank of Nahal Yattir and covers some 15 dunams. The site was excavated in 1982 by Alon, following illicit diggings (Kloner and Tepper 1987, 154-159). A small fortress was uncovered at the western sector of the site, under which a hiding complex was surveyed and partly excavated. The pottery and numismatic finds suggest the building was constructed in period between the two revolts, in the late 1st century – early 2nd century AD. The rectangular building measures: 22.5x34.2x36.5m (**PL. V.33: 1-2**). Alon offered to regards the fortress as the southern of the group of fifty fortresses mentioned by Cassius Dio. It has a single gatehouse, equipped with white plastered benches, that leads to a central square courtyard (12.5x12.5m). Elongated storing rooms were constructed at the south and western wing, while small square living rooms and rectangular service rooms occupies the northern and eastern wings of the courtyard. Three stairs flights were preserved along the south, west and east courtyard's walls. A bell-shaped cistern was hewn in the courtyard.

During the Second Revolt the walls of the building were thickened, the entrance was narrowed and a hiding complex was constructed. Some four entrances holes to a hiding complex were uncovered in the northern rooms. At least 60m of the complex were surveyed. One or its branches leads towards the above noted cistern, thus allowing a concealed access to water. Another tunnel had been presumably intended as an escape facility, leading away towards Nahal Yattir. Skeletal remains of elderly inhabitants, women and children were uncovered at the lower levels of the hiding complex. The excavators suggested that they have found their death as a result of suffocation from smoke inhaling. The site came to ruins by the strong conflagration in AD135, as attested by the coins from year 3 of the revolt uncovered at the site, as well as Ascalonian coins from the times of Trajan and Hadrian, and silver dinars from the days of Trajan and Hadrian.

Militaria

The excavations of the fortress yielded several weapons that seemingly dates from the violent destruction of the site during the Second Revolt. Some of which may have been in the possession of the attackers – like the socketed *pila* and the *caliga* hobnail. Others, such as a backed dagger and a long heavy spear seemingly furnished the rebels. A backed dagger was uncovered in a burial (see: Chapter 3 (iii) *b*).

Catalogue

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail **PL. V.33: 3**
Site:.....Nahal Yattir Site
Provenance:.....Fortress
Excavation No.:...Room 2; B. 36
Material:.....Iron
Dimensions –
Height:.....13mm
Height of head:.....6.5mm
Diameter of head:...13mm
Length of spike:.....10mm+

Corroded. It bears oxidized signs of leather (?). The tip of the bent spike is broken.

Parallels: siege camps around Masada (III.20/D; Gutman 1964, 115), Masada (Yadin 1965, 91), Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1-2), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

Edged weapons

Daggers

1. Backed dagger **PL. V.33A: 1**
Site:.....Nahal Yattir Site
Provenance:.....Burial
Excavation No.:...Tomb 4
Material:.....Iron
Dimensions –
Length:.....242mm+
Width:.....19-21mm
Thickness:.....6mm
Diameter of rivet:...7mm

Near complete straight backed dagger (Chapter 3 (iii) *b*). The iron elongated blade exhibits signs of sharpening of its proximal working edge. The haft is broken and still retains one attachment rivet.

Parallels – see Mo'a (IV.5/F.1); also next item.

2. Backed dagger ? **PL. V.33A: 2**
Site:.....Nahal Yattir Site
Provenance:.....Fortress
Excavation No.:...Room 35; B. 353
Material:.....Iron
Dimensions –

Length:.....122mm+
Width:.....26mm
Thickness:...7mm

Corroded fragment of backed dagger (?) blade.

Parallels – see previous item.

H. Shafted weapons

1. Socketed *pilum* **PL. V.33B: 1**
Site:.....Nahal Yattir Site
Provenance:.....Fortress
Excavation No.:...Room 21; B. 76
Material:.....Iron
Dimensions –
Length:.....295mm
Diameter of head:.....9mm (distal end)
Diameter of socket:....36mm (proximal end)
Thickness of socket:...6-9mm
Length of slit:.....82mm

Socketed *pilum*. The socket still retains wooden remains of the shaft. It is identical in shape to the example from Bethther (V.6/H.1). Parallels – Augusta Raurica (CH), (Deschler-Erb 1999, No. 51, Taf. 4).

2. Heavy spear ? **PL. V.33C: 1**
Site:.....Nahal Yattir Site
Provenance:.....Fortress
Material:.....Iron
Dimensions –
Length:.....612.72mm
Diameter of head:.....43.2mm
Length of slit:.....66mm
Thickness of socket:...3.33mm
Diameter of socket:....26.6mm

Several iron fragments were uncovered in Room 21, consisting of a point, body (with elliptical cross-section) and socketed element. Fabian interpreted the find as a heavy spear asserting that the two distal parts fit together (**PL. V.33C: 1** – left). Alternatively, the socketed element may have been in fact part of a socketed *pilum* – see previous item. A *graffiti* of a long spear was found at Kh. as Salantah (**PL. V.32A: 2**).

I. Archery

1. Iron flat arrowhead **PL. V.33D: 1**
Site:.....Nahal Yattir Site
Provenance:.....Burial
Excavation No.:...Tomb 3; B. 15
Material:.....Iron
Dimensions –
Length:.....74mm

Width:.....16mm
Thickness of head:...4mm
Diameter of tang:.....7mm

Iron flat leaf-shaped arrowhead. The circular cross-sectioned tang is broken.

V.34 – Kh. Hillel

Map ref.: 1601 1182

Other names: Horvat Hilel

PL. V.34

Geography and history

The site of Kh. Hillel is situated 1km northwest of Kfar Etzion and some 6km from the ancient city of Bethther (V.6). The site occupies a mountain range, with the elevation of 870m, which drops westwards from the watershed. Two strata were observed: an early Roman period (1st century BC – 2nd century AD) and a layer from the Byzantine period (4th-7th century AD). The early layer comprise of a Jewish agriculture estate that was erected in the days of Herod. A large building complex was uncovered in the centre of the estate, in the surroundings of which three entrances for a hiding complex were detected. The western wall of this building was reinforced, presumably during the preparations to the revolt (**PL. V.34: 1-2**). The settlement came to ruin in the wake of the Second Revolt, as clearly attested by the culture material and the numismatic evidence (Amit 1993).[126]

Militaria

A single copper-alloy arrowhead was found tacked in the reinforced wall of the central building, which came to ruins during the Second Revolt. The head is typical to the Persian period and seemingly provides further evidence to the employment of old weapons by the Jewish rebels (Chapter 7 (i) *e*). In addition, two *caliga* hobnails were uncovered.

Catalogue

D. Military dress and footwear

Caliga hobnails

1. *Caliga* hobnail **PL. V.34: 3a**

Site:.....Kh. Hillel
Provenance:.....Surface
Expedition:.....Amit (1990)
Excavation No.:...B.386
Material:.....Iron
Dimensions –
Length:.....17mm
Diameter of head:....8mm
Height of head:.....4mm
Thickness of stem:...3mm

An iron dome head nail, the tip of the stem is bent. Parallels are known throughout the country: Masada (Yadin 1965, 91) siege camps around Masada (III.20/D; Gutman 1964, 115),

[126] The information regarding the military equipment is based upon an unpublished paper from 1990 written by David Amit, who has kindly provided me with its draft.

Gamala (III.3/D.1), Herodium (Stiebel 2003a, No. 1, 223, Fig. 7 – upper), Samaria (I.6/D.1), Kh. Itri (Bordowicz 2001, 45-48), Ketef-Hinom, Jerusalem (*ibid.*, 43-44), Kh. as Salantah (V.32/D.1-3), Kh. Hillel (V.34/D.1-2) Abi'or Cave (Bordowicz 2001, 45-48; V.15/D), Sandal Cave (V.14/D.1), Cave el-Jay (V.13/D.1) and Kfar el-Maker (Shaked 1996, 26).

2. *Caliga* hobnail **PL. V.34: 3b**
Site:.....Kh. Hillel
Provenance:.....Surface
Expedition:.....Amit (1990)
Excavation No.:...B. 385
Material:.....Iron
Dimensions –
Length:.....12mm
Diameter of head:....5mm
Length of stem:.....8mm
Thickness of stem:...2mm

Hobnail, smaller than the above. For parallels see previous item.

I. Archery

Copper-alloy arrowheads

1. Copper-alloy arrowhead **PL. V.34: 4**
Site:.....Kh. Hillel
Provenance:.....Wall
Expedition:.....Amit (1990)
Excavation No.:...W.38; B.296
Material:.....Copper alloy
Dimensions –
Length:...46mm+ (49mm)
Width:....14mm
Socket:...7.5 x 6mm

The arrowhead was found stuck to the reinforced section of the main building's western wall (W.38), that was destroyed in the Second Revolt (Amit 1993). It is a socketed two winged Scytho-Iranian arrowhead with a midrib, Stern's Type 2b (Stern 1982, 156). It was used in Palestine between the 7th and the 4th century BC. Typologically relating to the Persian period, which is unattested at Kh. Hillel, the arrowhead was presumably reused by the rebel forces. Such a phenomenon is known from Masada and a refuge cave of the Judaean Desert (Hecht Museum) (VI.2/I.4), as well as in Site of 'Bypass Shoham' (V.10/I.1) (Chapter 7 (i) *e*). Hence, it appears likely that the arrowhead was shot by the local defenders during the fight over the site.

Group VI (Collections)

At the IM, part of the group of weapons found in the environs of Hebron is on display. We may further note two *spathae* (presumably from the late second century AD), the celebrated statue of Hadrian found at Tel Shalem and a 3rd century AD belt mount (Stiebel 1997). In addition to the rest of the Hebron assemblage, *militaria* from Bethther as well as a few isolated objects from outside the country are in the museum's storerooms. The collections of the Rockefeller Museum, formerly the Archaeological Museum of Mandatory Palestine (PAM) includes few military artefacts from Bethther. The Golan Archaeological Museum (Qatzrin Museum) host several items from the excavations at Gamala.[127] An exhibition at the newly constructed visiting centre at the foot of Masada (The Yadin Museum) that is currently assembled will retain military equipment from the site. Acquired *militaria* objects from the antiquity market that have seemingly originated in the Judaean Desert are on display in the Hechte Museum, at Haifa University. The collections of the Institute of Archaeology retain military equipment from Bethther as well as few acquired objects of unknown origin. Isolated items are found in private collections (Zibenberg, Wolfe, Deutsch and Jeselsohn Collections), while several other *militaria* objects from Palestine are reported in museums and collections abroad (ROM; PEF).

VI.1 – The Israel Museum (IM) PL. VI.1-VI.1B

The celebrated group of military equipment that had been found in the vicinity of Hebron was acquired by Prof. Saul Weinberg whom donated it to the Israel Museum (Weinberg 1979; V.31). In addition, the museum's collections comprise the muscle armour clad statue of Hadrian from Tel Shalem (V.2/B.1; Chapter 3 (ii) *f*), production tools from Bethther, as well as a phallic pendent and a saddle horn cover from outside the country (North Africa?).

Catalogue

P. Varia

Caltrop

1. Caltrop PL. VI.1: 1

Part of Bezalel's collection. Possibly originated in Bethther.

Q. Riding equipment

1. Saddle horn PL. VI.1A: 1

Reg. No.: 71.4.349

[127] http://museum.golan.org.il/egamla.htm.

The embossed copper-alloy object is a left front saddle horn. It was bought in Jerusalem from the antiques dealer Kandu who claimed the piece was North African in origin. The centre of the convex object, which has a series of three-raised borderlines, is occupied by the embossed images of a lion's face above a juvenile head and a crescent motif that were clearly intended to be seen, indicating this horn was sheathing the saddle cover from the outside (**PL. VI.1B**). Parallels – Mainz Weisenau (Kessler 1940, Abb. 7: 1). Lower openings on front horn plates: Neuß (DE), Mainz Weisenau (DE), Moers-Asberg (DE) (Bishop 1988, Fig. 22B and Table 1, with bibliography) and Kops Plateau, Nijmegen (NL) (Willems 1992, 61-2, Fig. 9).

2. Phallic pendant (not illustrated)

A relatively large phallic pendent is found in the storerooms of the museum. It belongs to Type 10 of Bishop's harness fittings. The origin of the object is outside of Israel, possibly North Africa.

VI.2 – The Hecht Museum, Haifa University

PL. VI.2-VI.2A

The archaeological collection of Dr. Reuben Hecht consists the core of the Hecht Museum, in the University of Haifa (IL). It contains several military fittings dating to the early Roman period, among which we may note copper-alloy, iron and bone arrowheads as well as fragmentary scale amour. All this acquired items were reported to origin in the Judaean Desert in Second Revolt contexts. This notion is strengthen by the finds that were associated with some of the *militaria*. Accordingly, the armour scales were uncovered with a Bar-Kochbaic coin, while a trilobate iron arrowhead (VI.2/I.4) was uncovered with a rare socketed copper-alloy trilobate head, an elbow key – an item that was found in the Cave of letters (Yadin 1963a, 94-100) as well as at 'Moran 1' (Zissu, Ganor and Farhi 2001) in Second Revolt context. The finders were Bedouins of the Taamarah tribe, the people of which were responsible for the discovery of the first Dead Sea Scrolls, and the first refuge caves hence possibly suggesting locating the point of discovery in the central Judaean Desert.

A thumb ring of an unknown provenance is also included in the collection (H-1280). However, as the introduction date of the Mongolian release exceeded the scope of the dissertation, it was not included in the present study (mid-3rd century AD: James 1987; *contra* Coulston 1985, 275-278).[128]

Catalogue

B. Armour

Scale armour

1. A group of copper-alloy scales **PL. VI.2: 1-3**

Site:.....Refuge cave, Judaean Desert
Reg. No.:.....REH-004
Dimensions (of a single scale) –
Length:.....31.5-32mm
Width:.....16mm, 17-18.5mm, 20mm
Thickness of wires.....1.5-2mm
Diameter of lacing hole:.....4-4.5mm
Diameter of lateral holes:...1.5-2mm

The fragmentary section of the scale armour is reported to be found in a Judaean Desert refuge cave together with a Bar-Kochba's coin – Year A (AD132) (Meshorer 1998, 124, No. 447). It comprises of 61 copper-alloy scales. All scales belong to the same type, featuring a large lacing hole and two pairs of lateral attachment holes. They exhibit a nearly consistent length: 31.5-32mm but vary in width: 16-20mm. The assemblage is too small to determine

[128] Loaned arrowheads from Gamala are also on display.

whether this variation is functional in nature – representing different parts of the cuirass, or simply the result of variation in production.

I. Archery

Arrowheads

Iron trilobate arrowheads

1. Iron trilobate arrowhead **PL. VI.2A: 1**
Museum:.....Hecht Museum
Site:.....Judaean Desert
Provenance:...Cave (?)
Reg. No.:.....H-906
Material:.....Iron, wood, sinew
Dimensions –
Length:.....48mm
Diameter of foreshaft:...9mm
Width of head:.....12mm

Iron arrowhead to which still attached a small part of the wooden foreshaft. The head belongs to vane's Type E. The tip of the head is bent due to impact as well as its tang. The foreshaft broke just under the well-preserved sinew whipping.

2. Iron trilobate arrowhead **PL. VI.2A: 2**
Museum:.....Hecht Museum
Site:.....Unknown
Provenance:...Bought in Jerusalem
Reg. No.:.....H-1665
Material:.....Iron
Dimensions –
Total length:.....44.5mm+
Width:.....13.5mm
Length of blade:...30.5mm
Length of tang:.....16.5mm

Iron trilobate arrowhead. It belongs to Type C.

3. Iron trilobate arrowhead **PL. VI.2A: 3**
Museum:.....Hecht Museum
Site:.....Judaean Desert
Provenance:...Refuge cave (?)
Reg. No.:.....H-890
Material:.....Iron
Dimensions –
Total length:.....37.5mm+
Length of head:.....34.5mm
Width:.....12mm
Diameter of tang:...3mm

The head was found together with an iron trilobate head (below I.4) and an iron key (H-889), in a cave in the Judaean Desert, and is claimed to date to the Second Revolt. The vane is of Type A.

Bronze socketed arrowheads

4. Bronze socketed arrowhead **PL. VI.2A: 4**
Museum:.....Hecht Museum
Site:.....Judaean Desert
Provenance:...Refuge cave (?)
Reg. No.:.....H-894
Material:.....Copper-alloy
Dimensions –
Total length:.....42mm
Width:.....11mm
Diameter of socket:...7mm

Trilobate arrowhead, socketed. It is reported to be found together with an iron trilobate head (above I.3) and an iron key (H-889). It is a Scytho-Iranian arrowhead (Stern's Type 2b) dated to the Persian period (Stern 1982, 156), which appears to be a reused head, a phenomenon attested at Masada, Kh. Hillel (V.34/I.1), 'Bypass Shoham' (V.10/I.1) and a refuge cave at the Judaean Desert (VI.2/I.4) (Chapter 7 (i) *e*).

Bone arrowheads

5. Bone arrowhead **PL. VI.2A: 5**
Museum:.....Hecht Museum
Site:.....Judaean Desert
Provenance:...Cave
Reg. No.:.....H-751
Material:.....Bone
Dimensions –
Total length:...44mm
Width:.....8.5mm

According to the object's card, this rare bone arrowhead was discovered in the Judaean Desert, in a cave at the Dead Sea area. It has a triangular section with small barbs. The head exhibit a broken, round sectioned, tang. The upper part of the head broke and mended. The faces of the head exhibit clear oblique carving signs. Assuming that the craftsman was right-handed the head was worked from the tip towards the tang.

Bone arrowheads are rare find and in Palestine such an arrowhead was unearthed at Herodium (Stiebel 2003a, No. 7), additional example is attested in Cypros (I.5/I.1) and a painted example is part of the Deutsch collection (VI.7/I.1). Although commonly claimed to reflect the shortage of raw materials, bone heads were used in hunting (Coulston 1985, 268).

VI.3 – Zibenberg House collection PL. VI.3

During the early 70's of the last century, archaeological finds were found under the foundations of a house owned by the Zibenberg Family, which latter was opened to the public as a museum. The house is located in the southeast part of the present Jewish Quarter of the Old City of Jerusalem. As no archaeological criteria were applied in the excavations, no stratigraphic data is available nor a proper context. The military finds are thus assigned to the relevant periods, based on typological considerations alone. Mr. Zibenberg further informed me about the discovery of tiles marked by the stamp of *legio X Fretensis*. This find, however, is of no particular significance as was proven in the archaeological excavations of the Upper City (Avigad 1983, 205; Stiebel 1999, 69).

Militaria

In addition to one trilobate iron arrowhead, two *ballista* balls were found, as well as a reported two to three rolling stones that were unavailable for examination. The most interesting fitting is a spear model that was a badge of a *beneficarius*.

Catalogue

I. Archery

Iron arrowheads

1. Iron trilobate arrowhead
Site:.....Jerusalem, Zibenberg House
Provenance:...Unknown
Material:.....Iron
Dimensions –
Total length:.....44mm
Length of vanes:.....30mm
Length of tang:.....16mm
Thickness of tang:.....2-5mm
Width of vane base:...6.5mm

The very corroded trilobate arrowhead lacks one of its vanes and has lost its tip as well as part of its tang. The tang is slightly banded as a result of the head impact. Such heads are very common in both the First and Second Revolts' contexts. The location of the house in the Upper city of Jerusalem of the Second Temple period, suggest the head may be assigned to the Roman conquest of that area – that is 8th of *Elul*, AD70.

M. Torsion artillery

Ballista balls

The two limestone balls belong to the low calibre shots – two *librae*. Although we cannot date them, their origin in the Upper City, an area that was abandoned following the revolt and was only re-occupied in the Byzantine period, may suggest a linkage to the First Revolt.

1. *Ballista* ball
Site:.....Jerusalem, Zibenberg House
Provenance:...Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...90mm
Minimum diameter:....85mm
Weight:.....Not available

2. *Ballista* ball
Site:.....Jerusalem, Zibenberg House
Provenance:...Unknown
Material:.....Limestone
Dimensions –
Maximum diameter:...11mm
Minimum diameter:....10mm
Weight:.....Not available

Sliced in two, presumably as a result of impact.

S. Military decorations

1. *Beneficarius* badge
Site:.....Jerusalem, Zibenberg House
Provenance:...Unknown
Material:.....Copper alloy
Dimensions –
Length:.....115mm

A complete spear model. Made of cast copper alloy the elaborate head exhibits the typical features of the group known as 'benefiziarierlanzen'. Two pairs of scroll-like elements decorate the upper and lower parts of the head. A midrib runs along the head's front face and the indicative perforation is spaced on either of its sides. At the widest point of each side of the head, small depressions are observable. The tip of the head is now missing. The head crowns a thin and long shaft with several projections that appear to be a stylistic representation of the elements that decorates, for example, that shaft of the 'lanzenspitze' from Osterburken (DE) (Eibl 1994, Abb. 6; also Nelis-Clément 2000, 551, Pl. I 5.1-2). A near identical example is known from Stockstadt (DE) (*ORL* Nr. 33, Taf. 7.21; Behrens 1941, 20, No. 7, Abb. 22.10; Oldenstein 1976, no. 366, Taf. 39; Eibl 1994, 280, Abb. 9). Further

parallels are recorded in: South Shields (UK) (Allason-Jones and Miket 1984, 217-8, 3.740) and Carnuntum (AT) (von Groller 1905, 5, Abb. 30:6).[129]

Although could have functioned as ritual objects, these badges were seemingly used as baldric fittings (Eibl 1994, Abb. 13) or cloaks' pins, manifesting the rank and status of their wearer. A monument of a *beneficarius* of the *legio X Fretensis* was reported from Seia (Si'a) (SY) (*AE* 1936, 142; Nelis-Clément 2000, 357-358, No. I 122, Photo on p. 556). A tombstone of a *beneficarius* of the *legio V Macedonica* is further reported from Emmaus (IL) (*CIL* III, 14155.12; Nelis-Clément 2000, 359, No. I 127).

[129] A 4th century AD spear model was uncovered in Baldock (UK) (Stead and Rigby 1986, 136, No. 380). A miniature spear was found at Even Menahem (IL) (IAA no. 60-780), reported to date to the Late Roman period, but at time of writing was not available for examination.

VI.4 – Palestine Exploration Fund (PEF) PL. VI.4

One of the major archaeological bodies in the exploration of Palestine, most notably during the 19th and early 20th century was the London-based institution, Palestine Exploration Fund (PEF). Its collection contains several *militaria* objects, the origin of part of which is explicitly Palestine. In addition to a cheekpiece of a sport helmet from Jerusalem (James 1986a), the collection comprised material from the excavation of Samaria, among which the copper-alloy studded ring – haversack mount (I.6/L.1). Two tanged bodkin iron arrowheads of unclear the origin as well as two bodkin arrowheads and an elongated spear-butt also forms part of the collection.

Catalogue

A. Helmet

1. Sport helmet **PL. VI.4: 1-2**

See James 1986a.

H. Shafted weapons

Spear-butts (ferrules)

1. Iron spear-butt (not illustrated)
Collection:...PEF
Site:.....Unknown
Reg. No.:.....51/3113 (PEF 4720)
Material:.....Iron
Dimensions –
Length:.....150mm
Diameter of socket:.....18mm

An elongated socketed iron object. It appears to be neither a *catapult* bolt nor a socketed *pilum* head – compare with the 247mm long *pilum* head from Bethther (V.6/H.1), hence presumably function as a spear-butt. An identical item was found at Masada, dating from the First Revolt (III.19/H.3).

I. Archery

In addition to the three tanged trilobate arrowheads that were stored in the 'Palestine trays', I have observed in the PEF collection two iron tanged trilobate arrowheads of unknown origin, which were part of Dr. Wheeler's collection. One of which has a square cross-section, while the other exhibits a rhomboid cross-section.

Iron trilobate arrowheads

1. Iron trilobate arrowhead (not illustrated)

Collection:...PEF
Site:.....Unknown
Reg. No.:.....50/502?
Dimensions –
Length.....39mm+
Length of head.....34mm
Length of tang.....5mm+
Width of wing.....14-15mm

Parallels – Similar heads were found in both First and Second Revolt contexts: Masada (Yadin 1966, 16, 23b; Magness 1992, 60-63), Gamala (Gutman 1994, 95-97, photo on pp. 93-94) and Khirbet el-Hamam (Narbata) (III.7/I; Zertal 1995, 91) and Kh. Qumran (de Vaux 1973, 36; III.16/I). Refuge caves of the Judaean Desert – the Cave of Letters (V.24/I; Yadin 1963a, 91, Nos. 38-40 (II.9-10 and I.5), Fig. 32, Pl. 25) in Nahal Hever, the Cave of Arrows (Cave 31) in Nahal Se'elim (V.28/I; Aharoni 1961, 20, Pl. 9b) and at the Cave of the Pool in Nahal David (V.20/I; Avigad 1962, 183, Pl. 18c). It was also uncovered in the Murabba'ât caves (V.16/I.3-5; de Vaux 1961, 37, Fig. 9: 6-8), Cave FQ37 (III.18/I.1; Patrich 1994, 92, Fig. 16). It is further documented at Khirbet-el 'Aqd' (V.9/I; Gichon and Vitale 1991).

2. Iron trilobate arrowhead (not illustrated)
Collection:...PEF
Site:.....Unknown
Reg. No.:.....50/502?
Dimensions –
Length.....40mm+
Length of head.....38mm
Length of tang.....2mm+

Much corroded trilobate arrowhead.

Parallels – see previous item.

3. Iron trilobate arrowhead (not illustrated)
Collection:.....PEF
Site:.....Unknown
Reg. No.:.....51/3101 (PEF 4731)
Dimensions –
Length.....42mm+
Length of head.....35mm
Length of tang.....7mm+
Width of wings.....12mm

Parallels – see previous item.

VI.5 – The Royal Ontario Museum (ROM)

One of the early publications of the Royal Ontario Museum (ROM) – Canada, is dedicated to the material culture of ancient and modern Palestine (Needler 1949). The report of Needler includes a paragraph whose theme is the weaponry of the biblical and classical Periods, in which a few archery and artillery articles of the Roman period are there represented. It should be noted that apparently no systematic method stood behind the assembling of this group. From the scant information provided in the report, it may be assumed that most of the artefacts were purchased from local antiquities' dealers (for example, note on Needler, 1949, 53).

Catalogue

I. Archery

Iron arrowheads

1. Iron bodkin tanged arrowhead (not illustrated)
Site:.....Unknown
Location:.....Royal Ontario Museum
Museum number:...Unknown
Material:.....Iron
Dimensions –
Total length:.....35mm+
Width of blade (estimated from the drawing):...~8.33-12.5mm
Length of head (estimated from the drawing):...25mm
Length of tang (estimated from the drawing):....10mm+

A square sectioned iron arrowhead with partly missing tang. The existing end of the tang is bent, suggesting it has been caused by impact. Published in Needler's account on the Palestinian collection of the ROM, the type is asserted to 'belong to the Roman period although similar forms occurred earlier' (*ibid.*, 52-53, Fig. 13: c). The later statement has no grounds. As short iron bodkin heads are reported from the Crusader period (Ben-Dov 1975, 107), and no clear context for the head is available, it is not impossible that the head is of post-Roman date.

The head under discussion features a short body incompatible[130] with the relatively elongated structure of the Roman dated heads that were unearthed in both the First and Second Revolt contexts: Meroth (III.1/I.1-7), Gamala (III.3/I), Magdala (III.4/I.1), the Site of the Caves (III.5/I.1-35), Sandal Cave (V.14/I.1) and the Spear Caves (V.17/I.1).

K. Slingshots

1. Stone slingshot **PL. VI.5: 1**

[130] Although, an arrowhead (trilobate tanged head) with somewhat 'dumpy' proportions was uncovered at the Cave of the Letters (V.25/I.1).

Site:.....Unknown
Collection:.....Royal Ontario Museum
Museum number:...Unknown
Material:.....Limestone
Dimensions –
Total length:...55mm

A biconical limestone shot is noted in Needler's account (Needler 1949, 51, Fig. 12). It is said to be 'of a shape that is more commonly found in lead during Hellenistic and Roman times' (*ibid.*). The bullet's shape, on one hand, and the peculiarity of the material, on the other, seems to have puzzled the publisher. He thus left the dating question open, stressing alone that the pellet 'probably differs little from the stone used by David to smite the Philistine' (1Sam 17.50) (*ibid.*).

Needler was right in recognising the shape of the article as Hellenistic or Roman in date. However, what he could not know at the time was that aside of leaden biconical shots (*glandes*), similar examples of stone did exist in the Roman Palestine as well. Two such limestone bullets were unearthed in Second Revolt context at Wadi Murabba'ât (V.16/K.1-2). The streaming lines of the biconical type provided the bullet with aerodynamic advantages, which are seemingly the reasoning behind its production.

M. Torsion artillery

Catapult bolts

Both types of Roman bolt heads are represented in the ROM collection – the tanged and the socketed head. Needler dated the iron points to the Roman period and asserted 'they were used both on cross-bow quarrels and on javelins' (Needler 1949, 53). While the initial statement appears to be correct, we may amend Needler's typological observation and identify the two artefacts as bolt heads rather than javelins.

1. Socketed *catapult* bolt **PL. VI.5: 2A**
Site:.....Unknown
Location:.....Royal Ontario Museum
Museum number:...Unknown
Material:.....Iron
Dimensions –
Total length:.....122mm+
Width of blade (estimated from the drawing):.....99.5mm
Length of head (estimated from the drawing):.....74.5mm
Length of socket (estimated from the drawing):...47.5mm+

Published as a heavy square iron projectile, the object has a long pyramidal head and a conical socket whose mouth is slightly damaged (*ibid.*, 53, Fig. 13: d). The structure of tapering square-sectioned head with its conical socket is typical to Roman *catapult* bolts,

commonly found throughout the Empire (Manning 1985, 175). In Israel similar heads are known from Gamala (III.3/M), Jotapata (III.2/M) and from the Figs Caves (V.19/H.1).

2. Tanged *catapult* bolt **PL. VI.5: 2B**
Site:.....Unknown
Location:.....Royal Ontario Museum
Museum number:...Unknown
Material:.....Iron
Dimensions –
Total length:.....143mm

A long pyramidal iron head with a broken tang. Needler dated the head to the Roman period and identified it either as an artillery bolt or a lance head (Needler 1949, 53, Fig. 13: e). The narrowing tang clarifies it is not a *pilum* head, nor should it be recognised as a point of a hand-throwing projectile. Similar heads which were unearthed in the West: for example in Vindonissa (CH) (Unz and Deschler-Erb 1997, 24-25, Nos. 421-458, Taf. 22, with ample bibliography), as well as in the East at: Qasr Ibrim (EG) (James and Taylor 1994) and Dura-Europos (James 1990, 94, 274-276, Nos. 41-51, Pls. 2.7D-E), clearly denote its function as a bolt head. An identical head was found stuck to the ceiling of the entrance of the Cave of the Pool (V.20/M.1). The context of this head indicates the employment of a portable *catapult* by the ascending Roman forces.

VI.6 – Rockefeller Museum (PAM)

The Rockefeller Museum hosts the collection of the Mandatory Antiquities Department of Palestine. It is today the house of the Israeli Antiquity Authority (IAA) while the museum is under the auspices of the Israel Museum.

Catalogue

H. Shafted weapons

1. Iron spearhead (not illustrated)
Site:.....Bethther
Collection no.:... PAM 1374 (Case U)

An 'iron spear-head with hollow socket from Bittir' is exhibited in the PAM (Case U – Inv. No. 1374; PAM 1943, 63). Though the item is part of the Byzantine display, its characteristics and the diminishing place of the Byzantine remains at the site clearly suggest the head is of Roman date. Very similar to previous item.

VI.7 – Deutsch collection

The unique painted bone arrowhead was part of the 'Bare Bones' exhibition, in the Eretz Israel Museum, Tel Aviv (2001).[131]

Catalogue

I. Archery

Arrowheads

1. Bone arrowhead **PL. VI.7: 1**
Collection:.....Deutsch Robert
Site:.....Unknown
Provenance:...Unknown
Material:.....Bone + green colour
Dimensions –
Length:...57mm
Width:....10mm

A bone arrowhead with a pyramidal cross-section. The head has small barbs. The barbs of the head seem to associate the head with the Hellenistic and Roman periods. In Palestine bone arrowheads were uncovered in Herodium (Stiebel 2003a, No. 7), Cypros (I.5/I.1) and supposedly in a refuge cave in the Judaean Desert – now in the Hecht Museum (VI.2/I.5). Although commonly claimed to reflect the shortage of raw materials, bone heads were used in hunting (Coulston 1985, 268).

[131] I thank Eitan Ayalon for the photo and details concerning this find.

VI.8 – Collections of the Institute of Archaeology, Hebrew University, Jerusalem

During the British Mandate, the collections of the Institute of Archaeology of the Hebrew University formed the basis for the foundation of the Israel Museum (IM), which is considered to be the national museum of the state of Israel. The collections retain several metal artefacts, which fall under the category of *militaria* from the Roman period. In addition to a *pilum* head from Bethther (V.6), and an inscribed leaden slingshot (VI.8/K.1), it consists of a pair of light javelin heads as well.

Catalogue

H. Shafted weapons

Pila

1. Socketed pilum head
Collection:...Institute of Archaeology, Hebrew University, Jerusalem
Site:.....Bethther (purchased the from Monastery of Dormitio St. Mariae, Jerusalem)
Reg. No.:....4997
Material:.....Iron

A socketed pilum head. It was found at Bethther. Dated to the Second Revolt, it is the latest example from Palestine yet to be unearthed (V.6/H.1).

2. Light javelin head
Site:.....Unknown
Reg. No.:...8776
Material:.....Iron
Dimension –
Length:.....94mm
Width of blade:...15mm
Thickness:.....7mm

Collared light javelin head with facetted blade. It has a relatively long tang, while its tip is slightly chipped, presumably due to impact.

The head is a variation of the collared javelin head, which is commonly found in Second Revolt contexts (the Large Caves Complex (V.15/H.1), Wadi Murabba'ât (V.16/H.4) and the Sela' Cave (V.27/H.1) – also *cf.* cave FQ37 (III.18/H.1)). The closest example is a collared and facetted light javelin head is reported from the Dinar Cave (V.18/H.1). Two facetted heads were found the Murabba'ât Caves (V.16/H.3 and M.1).

3. Light javelin head
Site:.....Unknown
Reg. No.:...7130
Material:.....Iron

Dimension –
Length:.....85mm
Width of blade:...20mm
Thickness:.....6mm

Light javelin head, typical of the Second Revolt period. The blade is faceted and exhibits a rounded tip. Short tang.

Parallels – See previous item.

K. Sling

Lead slingshots

1. Lead slingshot

Collection:...Institute of Archaeology, Hebrew University, Jerusalem (purchased from Monastery of Dormitio St. Mariae of Jerusalem)
Site:.....Unknown
Reg. No.:.....1854
Material:.....Lead
Dimension –
Length:.....33.5mm
Maximum width:.....15mm
Maximum thickness:...14.5mm
Weight:.....37.92 gr

See Stiebel 1997.

VI.9 – Wolfe Family collection

A bone buckle was included in the 'Bare Bones' exhibition 1999, in the Eretz-Israel Museum, Tel-Aviv. The D-shape buckle has a copper-alloy hinge that still holds the curved bone tongue. It differs from the bone scrolled decorated buckles that are reported from Western military sites (see below).

Catalogue

G. Belt

Buckles

1. Bone buckle **PL. VI.9: 1**
Collection:...Wolfe Family collection
Material:.....Bone and copper alloy
Dimension –
Width:...48mm

The D-Shaped buckle has a copper-alloy hinge and an intact bone tongue, decorated with two curved width ridges (Ayalon and Sorek 1999, 68, Fig. 101). Two parallels were uncovered at Caesarea (IV.1/G.1-2). In the West, bone buckles are documented in several military sites: (UK) (Grew and Griffiths 1991, Nos. 129, 131, 152, 156); Baden (CH) (Unz 1972, 47, Nos. 17, 55, Abb. 4); Vindonissa (CH) (Unz and Deschler-Erb 1997, Taf. 14, Nos. 1192-1209); Lyon (FR) (Béal 1983, 381ff, Nos. 1340-1342, Taf. 64); Buciumi (RO) (Chirila *et al.* 1972, Taf. 102, 3). The scrolled decorated buckle, with its fleur-de-lis tongue, is regarded as the typical military type. Since the shape of the buckle under discussion is not necessarily associated with the military *balteus*, and its origin is unknown, the buckle is not necessarily military in nature.

VI.10 – Jeselsohn collection

The Jeselsohn collection retains a rare short sword/dagger copper-alloy scabbard.

Catalogue

F. Edged weapons

1. Copper-alloy scabbard
Collection:.....Jeselsohn collection (2002)
Provenance:...South part of the Judaea mountains (?)
Material:.....Copper alloy (+ organic material)
Dimensions –
Length:.....407mm
Width:.....60mm
Width of tip:.....22mm
Thickness:.....2-2.5mm
Width of ridges:...2mm

The origin of the scabbard was asserted to be the south sector of the Judaean mountains. The complete copper-alloy object was made of two mid-ribbed plates, the wider of which overlaps the edges of the other. Two parallel grooves and ridges run along the edges of both the scabbard's faces. The scabbard tapers into a round tip. It has suffered a break across its centre, but was mended with minimal lose. Interestingly, a parchment-like material adheres to both the scabbard's faces, mainly to its lower halves. The exact identification of the material is yet unknown, but under a microscope it appears to be organic in nature.

The size of the scabbard indicates it used to sheath a short sword, although a dagger is also a plausible option. To the best of my knowledge the only parallel for this scabbard derives from Samaria (I.6/F.1). The Samarian example was found in a gateway from the reign of Herod (37-4BC), surely after 25BC – the foundation date of Sebaste in honour of Augustus. This focuses the date for the scabbard to the early years of Augustus reign (25-4BC).

Armis et litteris

The military equipment of early Roman Palestine, in light of the archaeological and historical sources

by

Guy Daniel Stiebel

Thesis submitted for the degree of Ph.D.

at the University of London

2007

Volume 3 – Plates

'Better is the sight of the eyes than the wandering of the desire. This also is vanity and a chasing after wind'

(*Ecclesiastes* 6.9)

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Group VI (Collections)

Catalogue

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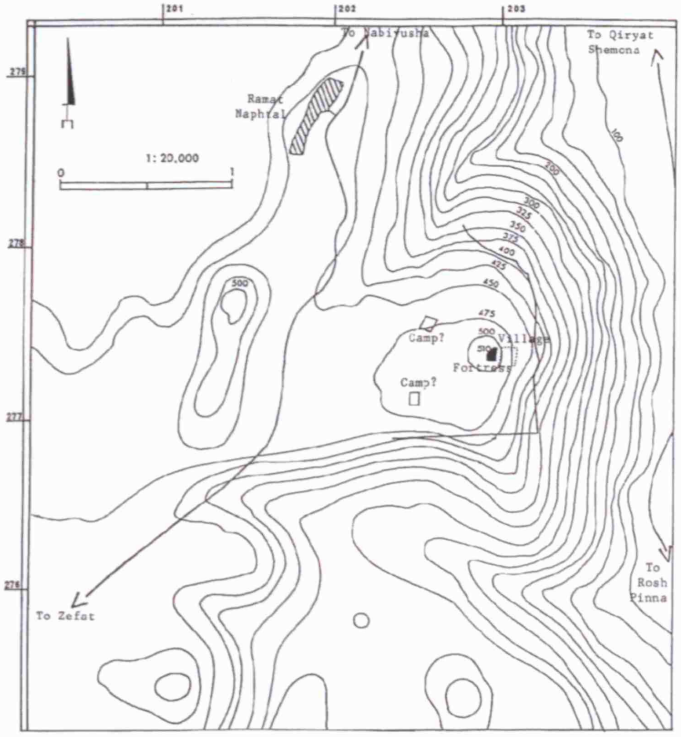
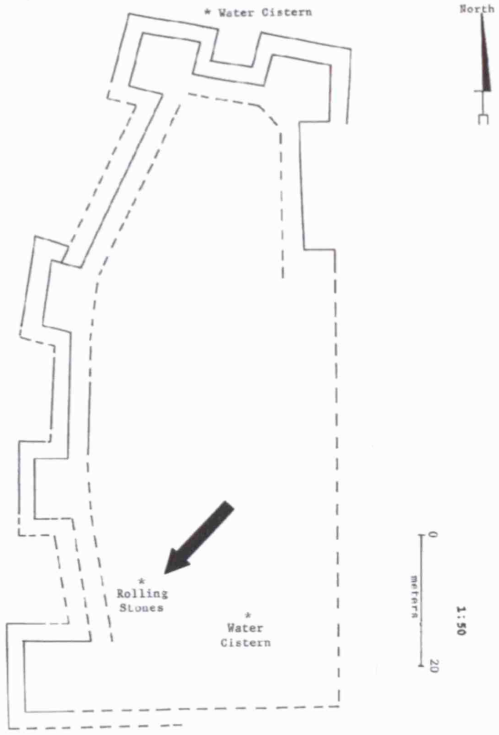


1. The site and its environs (After Aviam 1997, Plan 2)



2. Plan of site (After Aviam 1997, Plan 1)

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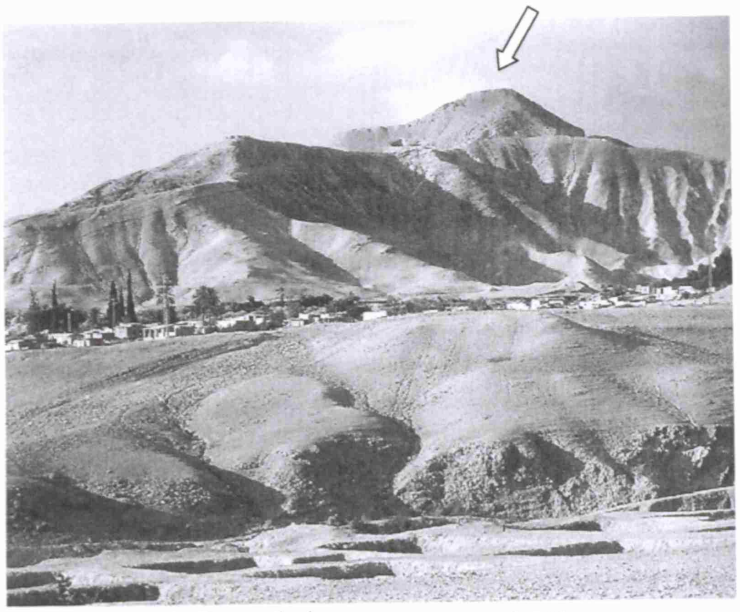

1. General view (After *Jericho* II, Ill. 267)

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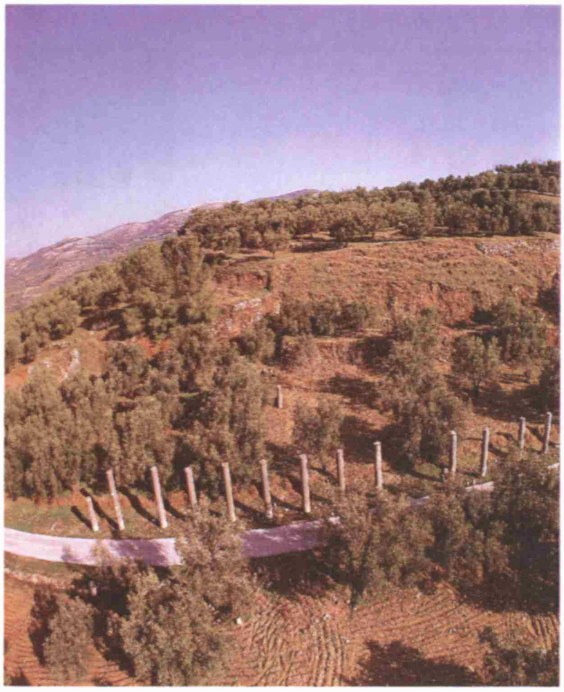
PL. I.6



1. General view (Tal, Haramati and Reich 1994, 111)

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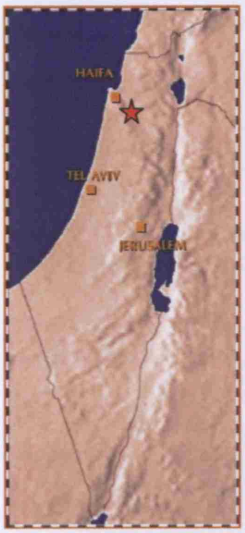
Pl. III.4

III.5 – The Site of the Caves Pl. III.5

III.6 – Sepphoris

PL. III.6



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III.13 – West Wall, Jerusalem

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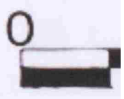
III.14 – The Armenian Garden, Jerusalem PL. III.14



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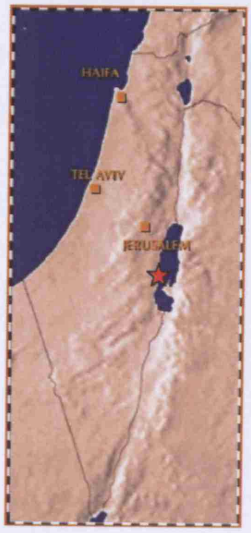
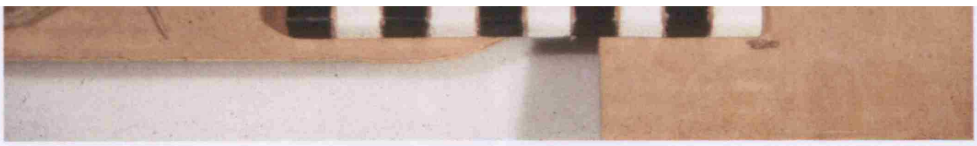


5. Buckle (1:1)

6. Buckle (1:1)



2. *Scutum* board (detail) (1039-139 = Shield No. 1) (G.D.S.)

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